Airport Wildlife Management Plan

for

La Ronge/Barber Field Regional Airport

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Last Reviewed by Jim Burr: October 2021
To be reviewed a minimum of every two (2) years

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Distribution List:

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

Name	Agency	Copies
Jim Burr	La Ronge Airport	1
Ken Harrison	Transport Canada	1
Steve Brown	Town Of La Ronge	1
Peter Boniface	Air Operations	1
Dan Boyer	Nav Canada	1
Kristi Knight	Rise Air	1
Candace Czemeres	Great Slave Helicopters	

Amendments List:

(Amendments to the Airport Wildlife Management Plan will be shown on this list.)

Date of Amendment	List of Changes	Completed
Feb 1, 2008	Updated "Distribution List" Added Amendments Page, Page 61	
July 3, 2008	Changes to "Distribution List" Page 61, Page 62	
Sept 12, 2013	Changes to Title Page Contact info	Jim Burr
	Changes to "Distribution List" Page 2	Jim Burr
	Removed "Grumman Tracker" from list on Page 4	Jim Burr
	Runway 10 28 updated to 11 29 on Page 4	Jim Burr
	Inserted location map on Page 5	Jim Burr
	Added "*See Appendix 3…" on Page 10	Jim Burr
	Added Appendix 3 to back of document	Jim Burr
	Added "report online" to Page 55	Jim Burr
	Updated link to Strike Forms on Page 56	Jim Burr
	Next review date edited to "December 30, 2013" on Page 59	Jim Burr
	"ATS" changed to "FSS" on Page 59	Jim Burr
	Edit to Table 15 on Page 61	Jim Burr
	Edit to Table 16 on Page 62	Jim Burr
* See Appendix D for continuing Amendment List		

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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. A checkmark has been applied to the conditions that apply to *La Ronge/Barber Field Airport*.

√ *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 turbo-jet powered) certified under Canadian Aviation Regulations to carry more than ten passengers, e.g., regular commercial flights, commuter operations, sightseeing operations.

√ *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; and,
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.

√ *Where the presence of wildlife hazards, including those referred to in section 322.302 of the CARS 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; and
u) cormorants.

- ❑ *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.

- ❑ *Is located in a built-up area.*

3. Goals and Objectives

The Goal of this Airport Wildlife Management Plan (AWMP) 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 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 wildlife management plan 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 AWMP 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.

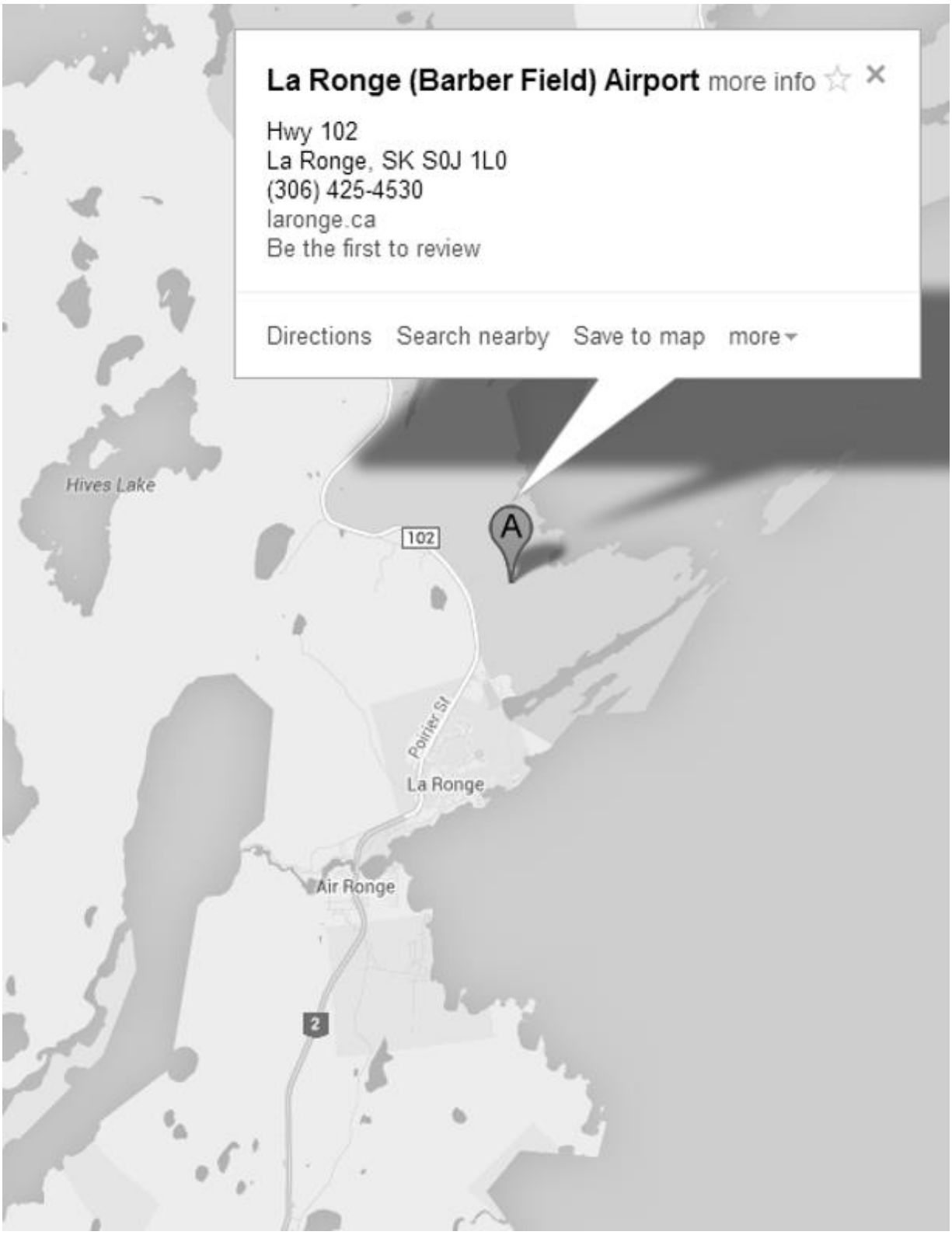
4. Description of Airport Operations

The La Ronge/Barber Field Airport is owned and operated by the Town of La Ronge. Ownership of the airport facility was transferred from Transport Canada to the Town on April 2, 1998 under the National Airports Policy. The airport is located approximately 7 km north of the Town site and is bounded on the north by Lac La Ronge, on the immediate south by a golf course and on the east and west by bush, swamp and muskeg. Located within the Precambrian shield the airport lands exhibit typical topographical features with lakes and hilly wooden terrain. Vegetation is primarily moderate to heavy mixed bush. Adjacent lands are natural resource areas consisting of lakes and bush.
The airport is used for extensively for scheduled and charter air services acting as a hub connecting remote northern Saskatchewan communities and mining sites through the south to Prince Albert, Saskatoon and Regina. Northern Air Operations, a division of Saskatchewan Environment, makes extensive use of the airport as a major forest fire fighting base. Typical aircraft using the La Ronge/Barber Field airport on scheduled and charter flights include, but are not limited to the following: Saab 340, Jetstream 31, ATR 42, Twin Otter, King Air, and Navajo. The forest fire fighting fleet consist of Convair 580, CANADAIR CL215, Turbo Commander and the Baron.

The La Ronge/Barber Field Airport consists of 2 runways:
Runway 18/36: 5002ft long x 150 ft wide, paved and lit with high intensity edge lights P1 PAPI and ODALS on both ends. Rwy Code is 3C Non-precision and approved for day/night VFR /IFR operations.
Runway 11/29: 2350 ft long x 50 ft wide, treated gravel unlit. Rwy Code is 1A Non-instrument

Nav Canada operates a 24-hour Flight Service Station and has a VOR/DME navaid on site as well as an NDB located approximately 4 nm from the airport.

Figure 1. Location Map



4.1 Aircraft Movements and Types

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

Without an effective AWMP, 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 Tables 1 and 2 provide estimates on recent aircraft movements and types at this airport.

Local traffic movements are higher in the spring due to the aerial forest fire fighting aircraft crews conducting recurrent training.

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. Local Airport Traffic

Classification	Annual Movements 2017	Trend in Movements	Comments
Piston under 5700 kg	10 %	Decreasing	
Piston over 5700 kg	20 %	Constant	
Helicopter	5 %	Constant	
Turbo prop under 27000 kg	65 %	Decreasing	
Turbo Jet			
[*others*]			

Table 2. Itinerant Aircraft Movements

Classification	Annual Movements 2017	Trend in Movements	Comments
Piston under 5700 kg	20 %	Constant	
Piston over 5700 kg	10 %	Decreasing	Forest fire fighting aircraft being converted to turbine engine aircraft
Helicopter	35 %	Fairly Constant	More movements in Spring/Summer
Turbo prop under 27000 kg	15 %	Increasing	New Government Forest Fighting Aircraft
Turbo prop over 27000 kg	5 %	Constant	Mostly military aircraft
Turbo Jet	15 %	Fairly Constant	Summer months
Turbo fan			
[*others*]			

In 2017 the airport recorded 22,313 movements.

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 AWMP. 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
• *Environmental Screening Report For Rehabilitation of the La Ronge Airport*	• *Local Wildlife Species*	• *Airport Office*

Table 4. Sources for Wildlife Information – Outside the Airport

Document/Source	Type of Information	Located
• *La Ronge Integrated Land Use Management Plan, January, 2003*	• *Wildlife Species Found in the area*	• *Airport Office*

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

Document/Source	Type of information	Located
Federal Species at Risk data, COSEWIC reports	*Lists species of wildlife that are threatened or of special concern due to their population*	*Ottawa, Ontario*

6. Strike Data

The annual reporting of strike data are required by the CARs. These data can be a valuable source of information on existing hazards. As a higher percentage of strikes are recorded and reported, this source of information will increase in value. The following table provides a brief summary of strike data for this airport since 1999.

Table 6. Strike Data for La Ronge/Barber Field Airport

Date	Aircraft	Wildlife Species and Number	Phase of Operation	Effect on flight	Comments
07 + 08/99	?	2 Ravens	?	?	Found during 2 Rwy inspections
08/99	?	1 Sandpiper	?	None	
08/99	CL215	1 Gull	?	None	
08/99	B190	1 Sandhill Crane	Take-off	Aircraft continued with flight	
08/99	?	1 Sandpiper	?	?	Found during Rwy patrol
08/99	DHC 6	1 Gull	Landing	None	
08/99	?	2 Kestrels	?		Found during 2 Rwy patrols
09/99	?	1 Sparrow	?	?	
06/00	?	1 Killdeer	?	?	Found during Rwy patrol
07/00	?	1 Crow	?	?	Found during Rwy patrol
08/00	JS31	1 Kestrel	Landing	None	

Date	Aircraft	Wildlife Species and Number	Phase of Operation	Effect on flight	Comments
08/00	**?**	1 Raven, 1 Kestrel , 1 Sparrow	**?**	**?**	Found during 3 Rwy patrols
09/00	PA31	1 Sparrow	Landing	None	
10/00	BE99	1 Sparrow	Landing	None	
01/02	BE20	1 White-tail Deer	Landing	Aircraft Damaged Grounded	
04/02	?	1 Grouse	?	?	Found during Rwy patrol
05/02	?	2 Sparrows	?	?	Found during Rwy patrol
08/02	?	1 Kestrel	?		Found during Rwy patrol
08/03	SF34	1 Kestrel	?	None	
08/03	?	1 Kestrel			
08/03	?	2 Sandpipers	?		Found during Rwy patrol
08/03	?	1 Kestrel	?		Found during Rwy patrol
09/03	?	1 Kestrel	?		Found during Rwy inspection
05/04	?	1 Sparrow	?		Found during Rwy inspection
08/04	ATR 42	1 Kestrel	?		
09/04	?	1 Kestrel	?		Found during Rwy patrol
05/05	DHC6	1 Robin	Take-off	None	
08/05	AEST	1 Sandpiper	Take-off	None	
08/05	ATR 42	2 Plovers	Take-off	None	
09/05	ATR 42	?	Landing	None	Strike reported no remains found

* Note: Strike data missing for 2001

*See Appendix C for current Strike Data

At this airport, the total number of wildlife strikes per 10,000 movements prior to the implantation of this regulation is approximately 2. The number of wildlife strikes per 10,000 movements recorded after implantation of the regulation will be provided in this section of future updates to this AWMP.

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 AWMP, the following sections will describe the functions (i.e., roosts, feeding habitat, breeding colonies, yarding areas) and attributes (i.e., species) associated with wildlife at three landscape categories. 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).

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 AWMP provide the findings of these three categories.

8. On the Airport

Figure 2 illustrates the primary habitats found on the airport lands.

Vegetation

The boreal vegetation in the vicinity of the La Ronge Airfield is located in the Churchill River Upland ecoregion, which is characterized by a mixture of coniferous, and mixed wood forest. Pure stands of jack pine and mixtures of pine, trembling aspen, white birch, balsam poplar and white spruce exist in sandy, glacial till upland areas. Black spruce and tamarack are found in low-lying bogs and fens. Open and shrubby bogs, peatlands and wetlands are common in this area.

Large shrub species, such as willow and green alder, provide cover in low canopy areas. Ground cover is also comprised of a variety of small shrubs, including Labrador tea and bog cranberry. Beaked willow and dwarf birch are abundant in wetter locations.

Figure 2. Coarse Wildlife Habitat Mapping

Table 7 lists the wildlife species known to occur on the airport.

Table 7. Overview of Wildlife Species Known to Occur on the Airport

Common Name	Scientific Name	Seasonal Occurrence	Locations, Abundance
Birds			
Great Blue Heron	*Ardea herodias*	*April to October*	*Occasionally spotted flying over airfield. Low numbers. Usually only a single bird.*
Canada Goose	*Branta canadensis*	*April to October*	*Occasionally on airfield, usually small flocks under 20 during spring and fall migrations Larger flocks fly over during migrations.*
Ring-billed Gull Herring Gull	*Larus delawarensis Larus agentatus*	*April to September*	*Occasionally forages airside on pavement or short grass after extended periods of rain, usually small flocks.*
Sandhill Crane	*Grus canadensis*	*May to September*	*When present usually in small numbers 2 to 4 occasionally larger flocks stopover during migrations. Seem to habitat quieter areas of airfield 200 feet or more away from runways.*
Barn Swallow	*Hirundo rustica*	*April to September*	*Occasionally breeds in buildings rarely noticed near runways.*
Sharp-tailed Grouse	*Tympanuchus phasianellus*	*Year round*	*Occasionally wanders close to runways or flies at low level crossing runway, usually small flocks of less than 10 birds. Rarely seen near runways during winter months.*
Snow Bunting	*Plectrophenax nivalis*	*April to November*	*Migrants, feeds airside, runway, usually small flocks, (less than 20), prefers seed heads over snow*
Black-capped Chickadee	*Parus atricapillus*	*Year round*	*Small flocks of 5 or so observed near edges of runways from spring to fall.*
American Crow	*Corvus brachyrhynchos*	*April to October*	*Often observed in flocks of various sizes from 5 to 25, usually alongside runways and approaches to runways.*
Common Raven	*Corvus corax*	*Year round*	*Small flocks usually less than 10 observed near runways during the summer. During the winter several can be observed over-flying airport south bound at daybreak and returning north during late afternoon (number count and flight path unknown).*
American Kestral	*Falco sparverius*	*May to October*	*Number counts not available present near runways feeding on grasshopper when grasshopper numbers are high.*
American Robin	*Turdus migratorius*	*May to October*	*Large numbers present early in spring rarely seen near runways usually groundside.*
Bald Eagle	*Haliaeetus leucocephalus*	*April to October*	*Can be seen soaring usually towards the north end of the airport in the spring and summer. Counts unavailable at this time*
Spotted Sandpiper	*Actitis macularia*	*May to September*	*Small flocks of 3 to 5 occasionally present along edges of runways*
White throated Sparrow	*Zonotrichia albicollis*	*May to October*	*Small flocks of 3-6 occasionally observed feeding along edges of runway.*

Table 7. Overview of Wildlife Species Known to Occur on the Airport

Common Name	Scientific Name	Seasonal Occurrence	Locations, Abundance
Mammals			
Coyote		*Year round*	*Usually only one or two seen on the airfield at one time however, up to 3 have been observed on one occasion.*
White-tailed Deer	*Odocoileus virginianus*	*Year round*	*Frequent outside airfield, now rarely airside*
Black Bear	*Ursus americanus*	*May to September*	*Mostly outside airfield fence, occasionally airside*

8.1 Adjacent Lands and Extremely Hazardous Land use Practices

Figure 3 illustrates some of the moderately hazardous land use practices within 8 km of the airport reference points and the extremely hazardous land use practices within 15 km.

9. Summary of Key Wildlife Hazards

The previous steps of the AWMP will 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., an insect hatch) causes birds to concentrate in 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.

Figure 3. Locations of Key Hazardous Land Uses

At this time it is believed that there are no known hazardous land uses within 15 km of the La Ronge/Barber Field Airport

Table 8 provides details of the key wildlife hazards, in no specific order, based on the previous steps in this AWMP.

Table 8. Key Wildlife Hazards at La Ronge/Barber Field Airport

Species	On-site Issue	Off-site Issue
Geese (all)	***Yes***	***Yes***
Gulls (all)	***Yes***	***Yes***
Hawks (buteos)	***No***	***Yes***
Ducks (all)	***No***	***Yes***
Eagles (both)	***Yes***	***Yes***
Sandhill Crane	***Yes***	***Yes***
Sparrows (all)	***Yes***	***Yes***
Shorebirds (all)	***Yes***	***Yes***
Swallows (all)	***Yes***	***Yes***
Grouse (all)	***Yes***	***Yes***
Herons (all)	***Yes***	***Yes***
American Crow/Common Raven	***Yes***	***Yes***
Am. Kestrel	***Yes***	***Yes***
American Robin	***Yes***	***Yes***
White-tailed Deer/Ungulates	***Yes***	***Yes***
Coyote/canids	***Yes***	***Yes***
Black Bear	***Yes***	***Yes***

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 will rely on information already presented in this document, other reports if they are available (e.g., gull hazard assessments), and information that is available in the literature for these particular species (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 are ranked 6 (lowest). See Section 11 (Risk Assessment) for more details.

Canada Goose	
Mass/Flocking Rank (1-6): *1*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to early October, generally absent June to late August.*	
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): *Will forage on airfield. Over fly airport during migration. May use surrounding lakes for resting during migration.*	
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 agl. Local roost site(s) and flightlines not known.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Few counts available ,flocks when present on airport usually number less than 20. Larger flocks over fly.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Migration route*	
Sources of Information for Species in this Area (list reports and other sources): *None known.*	
Strike Summary: *No reported strikes.*	
Other Comments: ***H****azing works for visitors, but special concerns remain for fly-throughs.*	

Sandhill Crane	
Mass/Flocking Rank (1-6): *2*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *May to September,*	
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): *Will forage on airfield. Likely feeds on shorelines of lakes and ponds in the area.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Occasional flocks, slow evasive actions, feeding in high risk zones, flying thorough high risk zones, but most do tend to be lower than 100 m agl. Local roost site(s) and flightlines not known.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Few counts available*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Feeding on airfield possibly nesting in the area. Possible stopover during migration*	
Sources of Information for Species in this Area (list reports and other sources): *None known.*	
Strike Summary: *One strike reported in 1999.*	
Other Comments:	

Gulls (mostly Ring-billed Gull)	
Mass/Flocking Rank: *3 for Ring-billed Gull, 2 for Herring Gull*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to October*	
Temporal (time of day): No specific time, during daylight hours	
Spatial (where in the area the hazard exists, hotspots): *Forage on runway for worms (especially during and after wet weather), short and mown grass for invertebrates. May move across high risk zones*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Use of airside areas, loafing on apron..*	
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): *Food sources as listed above, loafing on runway. Breed in the area, attracted to lakes in the area as well as the local landfill site.*	
Sources of Information for Species in this Area (list reports and other sources): *None known.*	
Strike Summary: *Two strikes reported in 1999.*	
Other Comments:	

Grouse Sharp-tailed and Ruffed	
Mass/Flocking Rank: *4*	**Species Protection Status:** *Provincial Fish and Wildlife Act*
Seasonality (time of year): *Year round*	
Temporal (time of day): *No known specific time may show at any time during the day*	
Spatial (where in the area the hazard exists, hotspots): *Over and around runways, grass areas, shrub thickets.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Low flying, occasionally crossing runway.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *No counts available, some flocks can number around 20.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *It is their natural habitat*	
Sources of Information for Species in this Area (list reports and other sources): *None known.*	
Strike Summary: *One strike reported in 2002.*	
Other Comments:	

Great Blue Heron	
Mass/Flocking Rank: *2*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to October.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Runways.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Low slow flight across airfield, low maneuverability.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Usually present in low numbers (one or two).*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Likely nests along nearby lakeshore.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *No reported strikes*	
Other Comments:	

Snow Bunting	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to November.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Runways.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Located near edges of runways while feeding.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Small flocks of usually less than 20.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Food source and likes barren open field of airfield*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *No known strikes*	
Other Comments:	

American Kestrel	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *May to October.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Runways.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Located near edges of runways while feeding or hunting often seen hovering above the field while it hunts..*	
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): *Likes the open-field habitat where it can feed on small prey animals such as mice and large insects such as grasshoppers* *.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *2-1999;2-2000;1-2002;4-2003;2-2004*	
Other Comments:	

Spotted Sandpiper	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *May to September.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Runways.*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Located near edges of runways while feeding.*	
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): *Prefers dry grassy fields, feeds on a variety of grubs worms and insects.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *2-1999; 2-2004; 1-2005*	
Other Comments:	

American Crow	
Mass/Flocking Rank: *3*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to October.*	
Temporal (time of day): *All day. May return 2 or 3 times the same day after being scared away.*	
Spatial (where in the area the hazard exists, hotspots): *Runways and approaches to runways*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Located near runways possibly feeding on insects.. Crossing runway at low levels. Can be seen in flocks of up to 25*	
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): *Possible food source.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *1-2000;*	
Other Comments:	

Common Raven	
Mass/Flocking Rank: *3*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Year round.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Runways and approaches to runways*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Located near runways possibly feeding on insects from spring to fall. Crossing runway at low levels. Can be seen in flocks of up to 10 in the summer Small numbers over fly airport in winter from roosting location, (which is unknown) believed to flying into Town site..*	
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): *Food source.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *2-1999*; *1-2000;*	
Other Comments:	

American Robin	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *May to October.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Rarely seen airside usually prefers groundside areas.*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Feeding in grass near runways*	
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): *Food source.* *Prefers the tree stands mixed with the open field and short grass.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *1-2005*	
Other Comments:	

White throated Sparrow	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *May to October.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Often present along edges of runways.*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Feeding along edges of runways fly across runway at low levels*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *When observed near runway usually small flocks of less than 6.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Food source.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *1-1999; 2-2000;2-2002; 1-2004;*	
Other Comments:	

Bald Eagle	
Mass/Flocking Rank: *2*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to October.*	
Temporal (time of day): *All day.*	
Spatial (where in the area the hazard exists, hotspots): *Soaring near the north end of the airport.*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Soaring across aircraft flight paths during arrival and departures.*	
Discussion of Numbers (peak counts, low counts, breeding pairs):	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Believed to nest in the area and feed on fish in the nearby lakes and streams. Natural habitat.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *No known strikes*	
Other Comments:	

Black-capped Chickadee	
Mass/Flocking Rank: *6*	**Species Protection Status:** *Provincial Fish and Wildlife Act*
Seasonality (time of year): *Year round*	
Temporal (time of day): *All day. Not present near runways during winter months*	
Spatial (where in the area the hazard exists, hotspots): *Runways.*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Feeding near edges of runways, cross runway at low level*	
Discussion of Numbers (peak counts, low counts, breeding pairs):	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Natural habitat, nest in the area.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *No known strikes*	
Other Comments:	

Barn Swallow	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *April to September*	
Temporal (time of day): *All day*	
Spatial (where in the area the hazard exists, hotspots): *Usually only present around buildings*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): ***Can be seen flying around apron area near the air terminal building***	
Discussion of Numbers (peak counts, low counts, breeding pairs):	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Attempts to nest in buildings*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *No known strikes*	
Other Comments:	

White-tailed Deer	
Mass/Flocking Rank: *1*	**Species Protection Status:** *Provincial Fish and Wildlife Act*
Seasonality (time of year): *Year round, less active mid-winter, now rarely airside since the erection of a wildlife perimeter fence*	
Temporal (time of day): *Often active at dawn and particularly dusk.*	
Spatial (where in the area the hazard exists, hotspots): *Move from forested lands to forage on grassland, mostly within forest patches.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Once inside fence they can cross runways in search of food or a way out of fence.*	
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 wetland plants, movement between forest blocks. Natural habitat.*	
Sources of Information for Species in this Area (list reports and other sources):	
Strike Summary: *1-2002*	
Other Comments: *Generally considered the highest risk species at airports.*	

Coyote	
Mass/Flocking Rank: *1*	**Species Protection Status:** *Provincial Fish and Wildlife Act*
Seasonality (time of year): *Year round*	
Temporal (time of day): *All day/night*	
Spatial (where in the area the hazard exists, hotspots): *Runways*	
Behaviors of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Crossing runways*	
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): *Natural habitat, hunt mice and other small prey on the airfield.*	
Sources of Information for Species in this Area (list reports and other sources): *None known.*	
Strike Summary: *1 strike 2001*	
Other Comments: *Attempted to hire trappers to eliminate species from airport but, have not had much success finding a willing trapper.*	

11. Risk Assessment

In the context of the AWMP, 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	60	
2	**Helicopter and Turboprop**	Moderate	17,000	
3	**Piston under 5700 kg**	Low	8,200	

In addition to the immediate airport environment, the risk assessment must consider the area outside of the airport. For this reason the typical approach and takeoff routes for all runways and both types of air traffic (i.e., local and itinerant) need to be considered. Figure 4 shows the approach and takeoff and the area where 90% of flights at this airport are typically below 500 to 600-ft agl.

We are primarily concerned with biomass that has the ability to affect safe flight. The following are general characteristics of high risk species or behaviour:

a) larger species which tend to cause greater damage due to higher impact forces (e.g., waterfowl, gulls and hawks);

b) flocking of birds (e.g., gulls, swallows, Snow Buntings) 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., meadowlarks, Snow Buntings, Snowy Owls); and

e) birds that habitually fly or soar into airspace used by aircraft (e.g., gulls or waterfowl on flightlines, vultures and gulls soaring).

If a hazardous species is particularly numerous (e.g., Rock Dove), then it might 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 5 overlays Figure 4 with likely wildlife pathways of connectivity and presents potential gull flight lines. The figure does provide 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 La Ronge/Barber Field Airport, Table 11 provides several risk assessment 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 10.

Figure 4. Elevated Risk Zones

Figure 5. Habitat Connectivity

Due to the surrounding habitat of lakes, ponds, swamp/marsh land and deciduous/coniferous forests many species of wildlife are present in the area, their exact route over or through the airport lands is not definitely known at this time.

Table 10. Risk Assessment Using Flocking Characteristics and Mass

Level of Risk	Characteristics	Example Species
Level 1	Very large (>1.8 kg), flocking	Geese, swans, turkeys
Level 2	Very large (>1.8 kg), solitary or Large (1-1.8 kg), flocking	Great Blue Heron Herring Gull, 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	Savannah Sparrow

Note: Based on Kelly, 2004.

Relative Hazard Score

This is sourced from Dolbeer *et al.* (2000). In the study, 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) is provided, based on *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 behavior (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 9). 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 (i.e., 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 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 La Ronge/Barber Field 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]	Transport Canada Hazard Rank[3]	Relative Abundance	Hazardous Behaviour	*1 (48)*	*2 (15,000)*	*3 (7,500)*
White-tailed Deer	1	100	1	***L***	***H***	***L***	***M***	***M***
Canada Geese	1	52	2	***L***	***L***	***L***	***L***	***L***
Snow Geese	1	52	1	***L***	***M***	***L***	***L***	***L***
Sandhill Crane	2	48	10	***L***	***H***	***L***	***M***	***M***
Bald Eagle	2	25	9	***L***	***M***	***L***	***M***	***L***
Ring-billed Gull	2/3	22	3	***L***	***L***	***L***	***L***	***L***
Great Blue Heron	2	22	17	***L***	***L***	***L***	***M***	***L***
Coyote	1	20	6	***L***	***H***	***L***	***M***	***M***
American Kestrel	5	14	19	***M***	***M***	***L***	***M***	***M***
Crows/Ravens	3	12	14	***M***	***M***	***L***	***M***	***L***
Spotted Sandpiper	4	12	12	***L***	***M***	***L***	***M***	***L***
Grouse	4	N/a	20	***L***	***L***	***L***	***L***	***L***
Sparrow	5	4	11	***L***	***M***	***L***	***M***	***L***
Snow Bunting	5	N/a	11	***L***	***M***	***L***	***M***	***L***
Swallows	5	2	15	***L***	***L***	***L***	***L***	***L***

Note: 1 This mass/flocking score is based on mass and the propensity of a species to flock. The scale is based on 1 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 9 and considers the type and number of traffic movements. The scale is based on: Severe, High, Moderate and Low.

The final management priorities provided in Table 12 will be consistent with the information provided in the Risk Assessment Matrix. A change in habitat conditions, wildlife attractants or aircraft type using the airport (e.g., an increase in commuter jets) will result in a re-assessment of risk.

Overall, the final management priority rank should make sense in the context of the information provided in the previous sections of this AWMP. The final rank does not consider how manageable the species might be, just what the current assessment of priority is for this airport.

Table 12. Wildlife Management Priorities for La Ronge/Barber Field Airport

Management Priority	Species Group
High	*Sandhill Crane*
Moderate	*White-tailed Deer*
	Coyote
Low	*Crows/Ravens*
	Kestrel

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.

None of the risk assessments by aircraft type were considered to be severe or high, primarily due to the aircraft types and volumes using the airport and existing management activities.

Of those identified to represent an elevated risk, Crows/Ravens and Kestrel are considered low priority, White-tailed deer and Coyote moderate priority and Sandhill Cranes high priority.

SECTION B: AIRPORT WILDLIFE MANAGEMENT PLAN

12. Goals and Objectives

The Goal of this Airport Wildlife Management Plan (AWMP) 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 AWMP 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 AWMP, including performance monitoring and annual reporting;
4. Establish communication procedures with respect to wildlife hazards;
5. Describe the training program, roles and responsibilities; and
6. Identify research needs that would assist the improvement of the La Ronge/Barber Field 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 AWMP, 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 AWMP 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, flax, soy, fall rye, wheat, barley and other cereals, 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, stormwater ponds, poorly drained areas	• Drain, improve drainage • Fill, over-wire, netting, BirdBalls™ • Grade slopes steeply, remove vegetation • Trap mammals (e.g., American Beaver and Muskrat)
Shrubs, trees, brush, hedges, woodland	• Remove, including undergrowth and understorey layers • Reduce biodiversity, habitat niches
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, • ElectroBraid™ fencing, • Buried fences • One-way gates, cattle gates.
Aircraft	• Ensure that bird nesting does not occur within parked aircraft, generally from April 01 to July 30 in Canada.

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
	Lasers	Birds, especially roosting	Moderate
	Falconry	Birds	High
	Border Collies	Birds, some mammals	High to moderate
	Live trapping	Birds, some mammals	Low to moderate
	Chemical – irritants	Birds	Low
	Playback of distress calls – remote system	Birds	Low to moderate
	Playback – mobile	Birds	Moderate to high
	Flags	Birds	Low to moderate
	Dead specimen birds	Birds	Moderate
	Chemical - behavioural repellents	Birds, mammals (on cables)	Moderate
	Radio-controlled models	Birds	Low (can be higher)
Lethal	Lethal trapping	Small mammals	Low
	Chemical – lethal control	Birds in buildings, mammals	High to moderate
	Chemical – Benomyl/Tersan fungicide	Fungus in turf but kills earthworms	Moderate
	Earthworm sweeping	Earthworms on hard surfaces	Moderate to high
	Surfactant water sprays	Roosting birds	Moderate
	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 Federal Registration Certificate is also required for individual firearms that identifies to whom they belong. More information can be accessed at: http://www.cfc-ccaf.gc.ca/en/default.asp.

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 **Environment Canada, Wildlife Enforcement Division, Mistasinihk Place, La Ronge, SK.**

Provincial and Territorial Regulations

Provincial and Territorial regulations may require a Small Game Licence, or similar, to hunt or trap crows, selected blackbirds and most mammals. In Ontario, for example, the licenced individual will also require an Outdoors Card (hunter version) and must attend a Hunter Education Course and pass the Hunting Licence Examination. The use of some chemicals may also be controlled, and provincial or territorial regulations should be consulted. *Confirm with Saskatchewan Environment Conservation Officers as to requirements needed to hunt/kill problem wildlife on airport.*

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. *Confirm with Town of La Ronge Bylaw enforcement officer regarding use of firearms on airport property.*

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 includes: regulation, outreach, education (wildlife hazard awareness program), discussion and persuasion. The following approaches can 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 AWMP, 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 (i.e., 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 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 storm water 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 AWMP. 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 La Ronge/Barber Field Airport

Section A of this AWMP 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 (chapters 1 and 2), 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 will be 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).

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

Sandhill Crane

Highest Airport Risk Ranking: Moderate
Management Priority: High

Summary:
This species was ranked high priority because it is frequently seen at the airport, and can fly across aircraft approaches at any time of the day. Cranes occasionally forage on the airport grass and like the area where there is small shrub/bush cover. It is a large-sized bird, has flocking habits and a relatively slow flight. The species is generally present from May through August.

The following steps will be undertaken:

1. *A zero-tolerance policy will be continued for cranes at the airport.*
2. *Wetland vegetation associated with drainage features will be cut and minimized in extent.*
3. *In short grass areas, fertilizer will not be part of the grass management regime.*
4. Pyrotechnics (reinforced with scare cannons and scare crows when necessary) will be used whenever cranes are seen during wildlife patrols or reported by staff or pilots.

14.2 Second Priority

White-tailed Deer

Highest Airport Risk Ranking: Moderate
Management Priority: Moderate

Summary:
This species is ranked moderate, rather than high, because of the completion of the wildlife perimeter fence in 2005. Deer observations airside have been drastically reduced.. Deer cause 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 grassed areas of the airport and seek cover in the short brush or wooded areas, especially in summer.

The following steps will be undertaken:

1. *A zero tolerance policy for deer incursions will be continued.*
2. *The wildlife fence will be inspected weekly and repairs made as needed, particular attention will be applied to crossings of drainage features.*
3. *Long grass areas will be maintained at a height not exceeding 50 cm.Reminder memos sent out to hanger lot tenants to remind them to close gates when not in use*

Coyote

Highest Airport Risk Ranking: Moderate
Management Priority: Moderate

Summary:
This species was ranked moderate because although the numbers of species observed are low their unpredictable behavior makes them a hazard to the airport. They do however, provide disturbance to White-tailed deer and limit the abundance of prey for raptors (e.g. mice).

The following steps will be undertaken:

1. *Gaps found under the wildlife fence will be filled in with either wire or granular material*
2. *Coyote dens on the airport property will be removed or destroyed in the early summer.*
3. *Pyrotechnics (reinforced with scare cannons) will be used whenever coyotes are seen during wildlife patrols or reported by staff or pilots.*
4. *Seek assistance from Sask Environment, Conservation Officers if coyotes become a persistent problem at airport.*

14.3 Third Priority

Crows/Ravens

Highest Airport Risk Ranking: Low
Management Priority: Low

Summary:
This species is ranked low, because although they tend to be attracted to the grassed areas of the airport they are easily scared off by pyrotechnics. It is likely the younger inexperienced of the species that are struck by aircraft. Due to their size and the flocking characteristics however, they are considered risk at this airport.

The following steps will be undertaken:

1. *Pyrotechnics (reinforced with scare cannons) will be used when crows/ravens are seen during wildlife patrols or reported by staff or pilots.*
2. *Monitoring of grass heights will also be studied to see if it effects the attraction of the species.*

American Kestrel

Highest Airport Risk Ranking: Low
Management Priority: Low

Summary:
This species is ranked low because even though several of the species are struck every year, due to their size damage to aircraft has not been a concern.

The following steps will be undertaken:

1. *Pyrotechnics will be used when kestrels are seen during wildlife patrol or reported by staff or pilots.*
2. *Monitor grass height to see if it affects the attraction of the species to the grassed areas beside runways.*

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. Daily airfield inspections include monitoring and recording wildlife activity on the Daily Inspection Sheets.

15.2 Annual Summary

During the annual manager review a written summary will be provided in the Annual Manager Report that discusses any environmental changes or unusual conditions that may have led (or might lead) to unusual wildlife hazard situations or changes in risk assessment.

This summary will also provide a discussion of wildlife interactions to help focus the need for future changes to the AWMP. 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 annual summary is a component of the Annual Manager Review and 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.

15.3 Wildlife Strikes

The regulations now 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. *La Ronge/Barber Field Airport will submit reports online as they occur (*http://www.tc.gc.ca/eng/civilaviation/opssvs/nationalops-caco-incident-menu.htm) *and an annual report.*

When reporting a wildlife strike, the Transport Canada form titled Bird/Wildlife Strike Report can be used and is available on-line at:
http://www.tc.gc.ca/eng/civilaviation/publications/tp13549-appendices-appendixc-2171.htm

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 AWMP.

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 are found on an airside pavement area or within 200 feet of a runway centreline, 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 feet 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 (i.e., 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 (i.e., 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 AWMP.

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 will be generated from the monitoring program and the annual strike report that must be filed with the Minister prior to March 01 of each following year. 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 will also be 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 AWMP 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. A list of action items is provided in Section 17; this will be put into tabular form for the updated AWMP and the status of the proposed actions will be noted.

Taken together, these seven measurements will form an effective and objective measurement of performance of the AWMP 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, such as a pond, 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.

Passive

1. *Short grass length at the airport will be increased to 12 cm target height with a maximum cut to 9 cm (except where shorter grass is required for navigation aids and drainage areas).*
2. *Long grass areas will be maintained at 30 to 50 cm.*
3. *Bare unvegetated areas will be minimized.*
4. *Both grass lengths will include efforts to cut prior to seeding and in the late fall to remove high standing seed-heads.*
5. *A grass management plan will be developed to reduce forbs and promote good grass growth without the use of fertilizer. Seed-head suppression technology will be investigated for application to grass.*
6. *Wetland vegetation associated with drainage features will be cut and minimized.*
7. *Vegetation along the wildlife fence will be cut as required and the fence will be checked weekly.*
8. *No crops will be grown at the airport.*

Active

1. *Wildlife patrols will be maintained at irregular intervals throughout the times when the airport is attended..*
2. *Wildlife patrols will note any dead wildlife as strikes within 200 feet of the runway.*
3. *Any animal carcasses on the airport will be recorded, removed by wildlife patrols and disposed of in a manner that makes them unavailable to scavengers.*
4. *Wildlife patrols will inspect the wildlife fence weekly, and will ensure rapid repairs.*
5. *Pyrotechnics will be used whenever high or moderate risk species are seen during wildlife patrols.*

6. *Wildlife patrols will be increased when staff is notified of increased wildlife activity.*
7. *Active Coyote dens within the airport will be destroyed during the summer.*

Other

1. *A Daily Wildlife Management Log will be established using prepared field data sheets.*
2. *Annual summaries will be established within the wildlife log.*
3. *An annual strike report will be prepared and submitted to Transport Canada by March 01 of the following year.*
4. *The AWMP will be reviewed and updated according to the Documentation Review schedule in the Safety Management System appendix.*

Equipment, Contract Requirements and Permits

1. *An equipment list will be prepared for the AWMP.*
2. *Federal kill permits for migratory birds will be updated as required.*

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 Services 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 (or UNICOM), especially those observed while taxiing.*
4. *Entry in the Canada Flight Supplement (CFS) to warn pilots of hazardous wildlife.*

19. Training Program

The Wildlife Management and Planning Regulation requires that a training program be established for the AWMP 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.

Effective wildlife management is critically dependant on staff with the tools, knowledge and motivation to complete the task at hand. Transport Canada has a standard training program that is available for wildlife management staff. The program will address the following:

- Nature and Extent of the Wildlife Management Problem;
- Regulations, Standards and Guidance;
- Ecology and Biology of Key Species;
- *Wildlife Control Procedures Manual* (TP 11500) and *Sharing the Skies* (TP 13549);
- Species of Conservation Concern;
- Liability;
- Habitat Management;
- Issues Outside of the Airport Boundary;
- Active Management;
- Removal Techniques;
- Firearm Safety (a pre-requisite being the Canadian Firearms Safety Course);
- Wildlife Management Planning;
- Development and Implementation of Awareness Programs;
- Monitoring; and,
- Training Record and Schedule.

In addition to training directly associated with wildlife behaviour and the application of management techniques as part of the AWMP, 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.

The following table (Table 15) details the staff who have attended the training program or are proposed to do so.

Table 15. Training Program

Name	Responsibility/ Title	Attended Training Program	Will Attend Training Program by
Jim Burr	• Airport Manager/	Sept 25, 2012	
Mark Markwart	• Equipment Operator/ Wildlife Management Officer	February 18th 2021	The Loomex Group
Matt Parada	• Equipment Operator/ Back-up WMO	February 18th 2021	The Loomex Group
Joey Lafleur	• Equipment Operator	Formal Training Pending	

20. Roles and Responsibilities

The airport manager will be responsible for the implementation of this AWMP. This includes the acquisition of the various permits, the provision of training and awareness programs and the review and submission of the annual strike reports and two-year updates.

The airport manager, or their designate, will be responsible for coordinating, supervising and the overall management of the AWMP on a long-term and a daily basis at the site-specific level. This will include the 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; AWMP 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 AWMP;

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 16. Key Roles and Responsibilities

Name and Contact Telephone Number	Title	Key AWMP Responsibilities
Jim Burr (306) 425-4530	Airport Manager & Wildlife Management Officer (WMO)	• Implementation of this AWMP • Acquisition of the various permits • Provision of training and awareness programs • Review and submission of the annual strike reports and two year updates • Maintenance of the Wildlife Management Log (e.g., including strike data, details on wildlife numbers and activity; AWMP measures undertaken, firearm use details; details on the use of lethal reinforcement and monthly summaries); • Co-ordination of the monitoring program; • Preparation of the annual strike report; • Ensuring that Airport operations are consistent with the requirements of the AWMP; • Ensuring that the appropriate permits are current and present on-site; • Undertaking deterrent activities; • Ensuring all activities are undertaken following standard practices and safety protocols; and, • The identification of equipment, resource and training needs
Mark Markwart (306) 425-4530	Equipment Operator & Back up to WMO	• Provide assistance to WMO in day to day activities and assume all WMO responsibilities when WMO is absent.
Tyrel Muirhead (306) 425-4530	Equipment Operator & Back up to WMO	• Provide assistance to WMO in day to day activities and assume all WMO responsibilities when WMO is absent.

21. 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 AWMP. 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.

Appendix A
Bibliography

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.

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.

Kelly, T. Safety System review of Land Use in the Vicinity of Vancouver International Airport. Unpublished draft February 2004. Prepared for Transport Canada, Ottawa.

Appendix B

La Ronge/Barber Field Airport Wildlife Management Plan Sign-Off Sheet

The following individuals have read this Plan and understand their role in the implementation of the Plan at this airport.

Signature	Responsibility/Title	Date
Jim Burr	APM	
Mark Markwart	Lead Operator	
Matt Parada	Operator	

Appendix C

Strike/Activity Data

* The following records begin in 2012 as of Jim Burr's appointment as Airport Manager – 2006 to 2011 data is missing

Date MM/DD/YY	Aircraft	Wildlife Species and Number	Phase of Operation	Effect on flight	Comments
08/19/12	SAAB 340	Crow 1	Takeoff Run		
09/3/12		Sparrow 3	Approach		
10/15/12	Twin Otter	Snow Bunting 5	Takeoff Run		
10/23/12		Snow Bunting 1			No cause known
07/31/13	Cessna	Raven 1	Takeoff Run		
08/12/13	Twin Otter	Unidentifiable	Takeoff Run		
08/13/13		Sandpiper 1			
08/14/13		Sandpiper 1			
08/21/13		American Kestrel 1			
08/22/13		Plover 2			
09/11/13	King Air	Common Yellowthroat 3	Takeoff Run		
23/05/14	1900	Coyote	Takeoff Run	Coyote crossed RWY – no strike – Osprey Wings aborted takeoff	
27-05-14		Sparrow			Not reported – found by operator
09/06/14		Pelican 2	On Approach	Two pelicans took flight at threshold of 18 – no strike	
12/08/14	C182	Kestrel	On Approach	Pilot reported that he hit a Kestrel on approach	No remains found
20/08/14		Warbler			Not reported – found by operator
10/09/14		Snow Geese 3		Euthanized	Could not scare off
2015	***No strikes***				

15/08/16		Sand Piper			Not reported-found by operator
02-09/16		Sand Piper			Not reported-found by operator
10-09-16	King Air	Sand Piper	On approach	None	
14-09-16	Saab 340	Warbler	On approach	None	
03-10/16	Twin Otter	Warbler	On approach	None	
06-20-17	King Air	American Kestrel	Roll out		
08-16-17	Saab 340	Snow Geese	Take off	None	Aborted takeoff
09-31-17	Saab 340	Sandpipers			
09-06-17	Commander	Sparrow	Roll out	Engine shut down	
09-07-17	Convair580	Sparrow	Roll out	None	
09-11-17	Convair580	Sparrow	Takeoff roll	None	Aborted takeoff
09-11-17	Baron	Sparrow	Roll out	None	
09-25-17	Saab 340	Sparrow	Roll out	None	
09-26-17	King Air	Sparrow			
10-20-17	Twin Otter	Unknown	Roll out	None	

(Appendix C con't)

2014 General Wildlife Activity

- Weasel tracks in front of ATB airside in March
- 3 eagles over 36 in April
- moderate Raven activity in the spring
- signs of Coyotes in the spring
- moderate small bird activity in the spring
- one Owl on 18 in June
- three bear sightings over the month June outside fence east side
- occasional Hawk activity mid-summer
- very minimal Killdeer activity over the summer
- minimal Kestrel activity over the summer
- Swallows mostly around buildings
- heavy Crow activity in July and August
- Sandhill Cranes were active on the strip of 18 36; south service road; north service road in July and August
- once early and once late in the summer two ducks on the NAO pond
- one flock of 40 Snow Geese that where chased off the threshold of 36 a number of times one morning in September
- one group of 3 Snow Geese that had to be euthanized in September
- Minimal Canada Geese activity in the fall
- Light (minimal) Warbler activity over the summer
- Bear droppings on 11 29, South and North Service roads inside fence in September
- a few grouse sighted by 11 29 in September

Jim Burr
APM

2015 General Wildlife Activity

Annual Wildlife Migratory Bird report submitted to Environment Canada on February 3rd , 2016

- moderate Raven/Crow activity in the spring and summer
- Coyotes; March 31, Sept 17, Nov 25
- moderate small bird activity in the spring
- very minimal Killdeer activity over the summer, mostly away from maneuvering areas
- Kestrel activity in August
- Swallows mostly around buildings
- Warblers in July on maneuvering area edges
- Sandhill Cranes were active on the strip of 18 36; north service road in April, May, July, August.

- ducks on the NAO pond over the summer
- Bear near NAO hangar in June
- deer August 17, 18, 21

Jim Burr
APM

2016 General Wildlife Activity

Annual Wildlife Migratory Bird report submitted to Environment Canada on February 3rd , 20167

- In March there were lots of deer and coyote tracks outside wildlife fence
- March 29th fox tracks on RWY 11 29
- Early April an increase in Raven activity and Fox tracks on airfield
- April 22nd Plovers and Robins returned
- Some Geese activity on Tanker Base Pond in late April
- May 5th first Geese migrating overhead
- May 6th Sandhill Cranes have returned
- July 4th – call out for coyote on Apron I and IV – operator did not sight coyote
- July and August – lots of Sandhill Crane activity
- Low Kestrel and grouse activity this year with the exception of a spike in grouse activity for a couple of weeks in August
- Some Snow Geese activity – less than in previous years

Jim Burr
APM

2017 General Wildlife Activity

Annual Wildlife Migratory Bird report submitted to Environment Canada on February 3rd , 2018

- February and March signs of Fox on airfield 3 times, sited once
- Heavy Crane presence this year – April, May, June, July, and especially August.
- Snow Geese on airfield in May
- Coyote present off and on throughout the year – May, July Sept, Nov (one coyote trapped in Nov)
- Ducks on NAO pond in May as well as crows on aprons
- Lots of Raven activity in June and occasional Kestrel

- Swallows nesting around ATB in July
- 1 Hawk off and on in July
- Sept migrating Snow Geese

2018 General Wildlife Activity

Annual Wildlife Migratory Bird report submitted to Environment Canada on April 9th, 2019.

For Activity Report refer to Annual Manager Review 2018 in APM filing cabinet or Wildlife folder on APM computer.

2019 and 2021 General Wildlife Activity

For Activity Report refer to Annual Manager Review October 2021 in APM filing cabinet or Wildlife folder on APM computer.

Appendix D

Date of Amendment	List of Changes	Completed
Feb 1, 2008	Updated "Distribution List" Added Amendments Page, Page 61	
July 3, 2008	Changes to "Distribution List" Page 61, Page 62	
Sept 12, 2013	Changes to Title Page Contact info	Jim Burr
	Changes to "Distribution List" Page 2	Jim Burr
	Removed "Grumman Tracker" from list on Page 4	Jim Burr
	Runway 10 28 updated to 11 29 on Page 4	Jim Burr
	Inserted location map on Page 5	Jim Burr
	Added "*See Appendix 3…" on Page 10	Jim Burr
	Added Appendix 3 to back of document	Jim Burr
	Added "report online" to Page 55	Jim Burr
	Updated link to Strike Forms on Page 56	Jim Burr
	Next review date edited to "December 30, 2013" on Page 59	Jim Burr
	"ATS" changed to "FSS" on Page 59	Jim Burr

	Edit to Table 15 on Page 61	Jim Burr
	Edit to Table 16 on Page 62	Jim Burr
Oct 6, 2014	Title Page -updated amendment date	Jim Burr
	p.15 – added Black Bear	Jim Burr
	p.36 – changed airport traffic to 60; 17,000; 8,200	Jim Burr
	p.42 – added snow geese	Jim Burr
	p.59 – added "Other #4."	Jim Burr
	p.61 – updated table 15	Jim Burr
	p.62 – updated table 16	Jim Burr
	Appendix C – updated strike activity – added "2014 General Wildlife Activity Report"	Jim Burr
	Appendix D – added this appendix D to track amendments	Jim Burr
Feb 2017		
	p.2 – amended distribution list	Jim Burr
	Appendix C – updated current strike data and wildlife activity	Jim Burr
	Updated Appendix D	Jim Burr
	Distributed amendments from 2014 and 2016 to all on distro list	Jim Burr
	Title page – updated amendment date	Jim Burr
Feb 2018		
	Updated wildlife data in appendix C	Jim Burr
	Updated aircraft movements tables page 6	Jim Burr
April 2019	Updated wildlife data in appendix C	Jim Burr
October 2021	Updated review date on title page	Jim Burr
October 2021	Updated appendix B	Jim Burr
October 2021	Updated appendix C	Jim Burr
October 2021	Updated Training Table page 61	Jim Burr

October 2021	Updated distribution list	Jim Burr