

Transport Canada- Environmental Affairs

APPENDIX B

Terms of Reference

**Standing Offers
Airport and Port Sites in the Quebec Region**

**Environmental Assessments, Biological Inventories and Plant and Wildlife
Management Plans**

April 10, 2015

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TERMS OF REFERENCE**1. BACKGROUND**

Transport Canada (TC) owns several port and airport sites throughout Quebec and must ensure that these sites are properly managed in accordance with the applicable environmental legislation. This legislation applies both to work carried out to maintain and/or modify these sites and their operation. More precisely, to respect the environmental legislation, TC must, in the context of the work required on these sites, conduct environmental effect assessments (EEA) under Section 67 of the *Canadian Environmental Assessment Act, 2012* and prepare applications for authorization under Section 35 of the *Fisheries Act*. Likewise, operating these sites involves having to ensure the environmental compliance of the operations with, among others, the *Species At Risk Act* and the *Federal Policy on Wetland Conservation*. TC is also responsible for ensuring safety from the hazards posed by the potential presence of wildlife on its airport sites, under Part III, Subpart 2 – Airports, of the *Canadian Aviation Regulations*. Subject to these regulations, it was determined that wildlife management plans must be produced for various airports owned by TC. These plans must aim to reduce, as much as possible, the risks the presence of wildlife poses to airport activities.

The selected suppliers who are awarded standing offers will be called to meet the objectives listed in Section 2. These suppliers will receive specific mandates at the appropriate time.

2. TARGET OBJECTIVES

The target objectives resulting from the above-mentioned background involve:

- Conducting environmental assessments (EA) of projects under Section 67 of the *Canadian Environmental Assessment Act* (CEAA) and/or under Section 22 or 31.1 of Quebec's *Environment Quality Act* (EQA);
- Developing and implementing environmental monitoring and/or follow-up programs stemming from an EA;
- Preparing applications for review and authorization under Section 35 of the *Fisheries Act* that is, preparing applications for authorization requires conducting research, documenting and proposing compensation projects;
- Developing wildlife and/or plant compensation projects mainly aiming to compensate for the loss of fish habitats and/or wetlands;
- Conducting wildlife and plant characterizations in aquatic and terrestrial environments (inventories);
- Identifying, delineating and describing wetlands and developing management plans to preserve such environments; and
- Preparing management plans for wildlife that poses a risk for airport safety.

3. SCOPE

To meet the above-mentioned objectives, the supplier will be called to carry out one or several of the following activities, according to the call-ups made by Transport Canada's project officer.

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3.1 Conducting Environmental Assessments

Most of the environmental assessments that TC will require are environmental effect assessments (EEA) carried out under Section 67 of the CEEA since most of TC's port and airport projects take place on federal lands. TC projects that must undergo environmental assessments under Section 22 or 31.1 of the EQA are not as frequent.

The environmental effect assessment report (EEAR) must include, without being limited to, the scope of the project, the scope of the environmental assessment, a full description of the project and the work that will be carried out in the course of the project, a work schedule, a description of the environment (physical, biological and human aspects) and of the valued environmental components, including the required information on special-status species, as well as all other elements required under Section 5 of the CEEA. An explanation of the methodology used to assess the environmental effects must be provided, together with an analysis of the project's environmental effects. The mitigation measures proposed must be economically and technically suitable to the project and the type of environment. The report should also contain an analysis of residual and cumulative effects and should propose a follow-up program as required. An environmental monitoring data sheet, which will be provided to the site supervisor during the work to ensure compliance with the environmental requirements, must accompany the report (appended). Any consultations with the general public should also be documented and included in the environmental effect assessment report.

The EEAR's table of contents must be presented as follows:

- Project justification
- Project description and work to be undertaken
- Scope of the project, scope of the environmental assessment
- Description of the environment and valued environmental components (VEC)
- Methodology used to assess the environmental effects
- Environmental effects and mitigation measures
- Assessment of residual and cumulative effects
- Project consultation with the general public (if applicable)
- Environmental monitoring and follow-up
- Decision with respect to the environmental effect assessment (TC signature block, with other federal responsible authorities if needed)
- References
- Appendices
 - o Environmental monitoring data sheet to be used during the work
 - o Figures and Plans
 - o Photographs of the site, if applicable
 - o Analytical results, if applicable
 - o Other

Any deviation from this format must be discussed beforehand with TC's environmental project officer.

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3.2 Developing and Implementing Environmental Monitoring and/or Follow-Up Programs

Developing an environmental monitoring program for the site work carried out in a given project must reflect the commitments made regarding said project's EA and all other environmental authorization documents. For TC, this program usually consists of a form indicating the following information: project identification, date(s) of the environmental monitoring, list of mitigation measures to apply at each step of the construction work, monitoring frequency required at each step, the findings for each mitigation measure, the measures taken to correct any non-compliances found, a space for the site supervisor to write comments and a section to identify the person in charge of the monitoring and to affix his/her signature.

A mandate could also involve the environmental monitoring of site work. The supplier will be responsible for validating the application of the necessary mitigation measures during the work. The supplier will therefore need to travel to the site of the work at the frequency agreed upon with TC's project officer and collect the requested information to demonstrate that the mitigation measures are applied or not. Depending on the project, one or more monitoring reports will need to be produced to report the findings for each mitigation measure and indicate the corrective measures taken to rectify non-compliances. The monitoring report(s) could include, at the request of TC's project officer, photographs and/or other documents, such as specifications, minutes of site meetings, an environmental emergency response plan, etc. These reports will be submitted to TC's project officer at a frequency agreed upon with the latter.

In regard to environmental follow-up programs, the nature of the requested follow-up could vary. A few examples of follow-ups conducted by TC in the past include following up on: a project to stabilize revegetated banks, the survival of eelgrass plantations, water quality during a contaminated sediment dredging project and the productivity of a new lobster reef installation. These programs generally span several years and involve submitting annual reports. The exact frequency and therefore the number of reports to produce will be defined during call-ups.

3.3 Preparing Applications Under Section 35 of the *Fisheries Act*

This mandate's objective will be to prepare applications for review and/or authorization required under Section 35 of the *Fisheries Act* for a given project. Applications must include, without being limited to, the elements listed in "An Applicant's Guide to Submitting an Application for Authorization under Paragraph 35(2)(b) of the *Fisheries Act*" (<http://www.dfo-mpo.gc.ca/pnw-ppe/reviews-revues/application-eng.html>). In summary, this application must include a description of the aquatic environment and the aquatic species present, a description of the project, a description of the project's impacts on the aquatic environment and species, the measures taken to minimize the impacts, the assessment of the residual impacts and finally, the compensation project developed for "serious harm to fish", if required. It is important to note that in this mandate, preparing an application for authorization does not include preparing the letter of credit that is usually required.

Such mandates may require taking inventories in aquatic environments, as well as developing a compensation project for "serious harm to fishes". If a wildlife habitat compensation project is required, the supplier may be asked to take one or several inventories, conduct documentary research to list potential compensation projects and suggest compensation projects adapted to

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the environment. For each compensation project presented, a succinct technical and financial analysis must be included in the report to enable each project's feasibility to be assessed. TC's environmental project officer may request a written report for each of these two steps.

It is possible that TC will offer mandates that are strictly limited to developing fish habitat compensation projects and/or characterizing projects, without including preparing the application for authorization under the *Fisheries Act*.

3.4 Conducting Characterizations in Aquatic and Terrestrial Environments (Biological Inventories)

As the owner of the sites, Transport Canada (TC) must ensure that its lands are properly managed and that the applicable environmental legislation is respected. The *Species At Risk Act* is one example of such legislation. In fact, some of TC's sites have a high potential of containing special-status plant and wildlife species. One of the objectives of the present mandate is to take inventory of precarious-status wildlife and plant species on certain sites pre-identified by TC. If precarious-status species are present, it will be necessary to evaluate if TC's work/activities have an impact on such species and if that is the case, conservation measures will need to be proposed.

Besides taking inventory of special-status species, various plant and wildlife inventories could be required, both in terrestrial and aquatic environments (avifauna, herpetofauna, vegetation, etc.) Characterizations in aquatic environments will mainly be used to complete the application for authorization required for certain projects under Section 35 of the *Fisheries Act*. TC projects that regularly trigger this provision are dredging projects that sometimes involve disposal at sea, as well as wharf demolition and/or rock filling projects. These inventories generally cover aquatic plants, benthic fauna and fish. Inventories in aquatic environments can involve diving and taking underwater videos.

3.5 Identifying and Managing Wetlands

As the owner of federal lands, TC must ensure that the *Federal Policy on Wetland Conservation* (the Policy) is applied on its sites. According to The Policy, TC must intervene so as to enhance the different ecological and socioeconomic functions and ensure that there is no net loss of wetland functions on its properties. However, it is important to note that The Policy applies on TC's sites as long as it does not affect the safety of port and airport activities (i.e. bird strike hazard). There are wetlands on some of TC's sites, mostly airports, for which TC has very little information. The sites are mainly located along the Côte-Nord, in James Bay and on the Îles de la Madeleine. To ensure that The Policy is properly applied on its lands, TC must identify, delineate and describe the wetlands on those of its sites identified as potentially containing wetlands. The identification and delineation of the wetlands must be carried out in accordance with the MDDELCC's simplified or expert botanical method. Once this information is gathered, certain sites could require the development of conservation plans.

Likewise, in the framework of projects to maintain or improve its infrastructures, certain work could impact the wetlands found on the sites (ex. project to extend a runway). At that time, identification and delineation of the wetlands could be required to properly assess the work's impact on the wetlands and develop mitigation or compensation measures to minimize impacts on these environments.

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3.6 Preparing Airport Wildlife Management Plans

Transport Canada's Programs directorate holds the certified airport operator certificate in Quebec and must comply with the various requirements of the *Canadian Aviation Regulations* (CAR). TC-Programs is therefore responsible for developing a wildlife management plan for its airports, in accordance with Section 322.305 of the Airport Standards - Airport Wildlife Planning and Management. In order to meet this regulatory obligation, a wildlife management plan will need to be developed for some of TC's airports. These plans must ensure the safety of passengers and crew members by reducing risks for aircraft and airport operations due to the presence of wildlife in the aerodrome and surrounding area. The above regulations apply to all certified airports in Canada and up to six of TC's airports could require the development of an Airport Wildlife Management Plan. Transport Canada's Civil Aviation directorate developed a model to help airport operators develop wildlife management plans (see Appendix 1-A). In short, the first step involves identifying the hazards by first describing the activities pertaining to airport operations at the given site, then drawing up a list of the animals that are present on the site or in the surrounding area and that pose a threat (description of their habitats and activities) in order to clearly identify the hazards and determine their level of priority. Then, the airport wildlife management plan must be produced, first setting the plan's aims and objectives, followed by the list of the different management measures to implement, in order of priority. The plan must also include the parameters of the daily log that must be kept for monitoring purposes, as well as the set performance indicators in order to define which aspects of the plan need to be improved or changed.

4. STATEMENT OF WORK

In due course, TC will provide the necessary information on specific mandates so as to obtain a service proposal. Suppliers with a standing offer must submit a succinct proposal, including, among other things, the methodology that will be used, a list of the employees assigned to the mandate and a detailed breakdown of the costs. After the supplier submits the proposal and it is accepted by TC and before the work is set to begin, a kickoff meeting will be held with the supplier and TC's environmental project officer in order to:

- Ensure a good understanding of the mandate;
- Discuss the schedule and deliverables;
- Provide the supplier with the available documents on the project and/or site;
- Identify the official contacts for both parties

This meeting, and subsequent meetings, can take place over the telephone or in person, in various locations, depending on the project.

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5. FULFILLING THE MANDATES

After the kickoff meeting, the supplier must examine the available documentation (provided for reference purposes) either directly at TC's office or at its own office. The supplier must check the accuracy of the documents during site visits, if applicable. All site visits must be authorized by TC's environmental project officer. The members of the work team must be able to travel within the province of Quebec, including to remote regions.

The supplier will also be responsible for consulting all other sources of information deemed necessary to carry out the mandate. Additional data may need to be collected, as discussed with TC's project officer.

Site Visits

When site visits are necessary, the supplier must agree on the visiting schedule with the person in charge of the site (port or airport manager), with the agreement of TC's environmental project officer. The supplier's activities on TC's lands must be planned in such a way as to avoid disrupting port and airport operations. For safety reasons, the supplier's employees must be accompanied by the person in charge of the site at all times when they are onsite. Security clearance is not necessary for site visits in the framework of this mandate.

Follow-Up between Transport Canada and the Supplier

These communications can take place over the telephone or electronically, or the parties may meet.

Submission of the Preliminary Version

After submitting the preliminary version of the deliverable, and after its analysis by the federal authorities involved in the process, the supplier must respond to TC and the other federal authorities' questions/comments, if any, and incorporate them in the document. The preliminary deliverable and final deliverable must be submitted in the timeframe set for the mandate. Additional question/comment exchanges may take place before the final version is submitted.

Submission of the Final Version

Once all the comments have been incorporated in the preliminary version, the supplier must submit the final version of the deliverable to TC's project officer for official acceptance.

6. DELIVERABLES

Generally, the preliminary and final reports must be submitted according to the schedule set by TC at the beginning of the mandate. The preliminary report must be submitted for comments in unlocked electronic format (in Word and PDF), along with one hard copy (or more, if other federal authorities are involved). The final report must be submitted in hard copy and on CD (in

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Word and PDF). The number of hard copies to provide for each report will be indicated upon the awarding of a specific mandate for each call-up.

All hard copies are to be printed on both sides of the page, on recycled paper. The format for the reports will be approved by TC's environmental project officer at the initial meeting scheduled at the beginning of the mandate. The usual working language is French, but some documents could be required in both official languages.

7. SCHEDULES

Depending on the nature and complexity of the mandate, schedules may vary. Consequently, TC will set the schedule upon awarding a specific mandate for each call-up.

8. COSTS AND METHODS OF PAYMENT

For each call-up issued, the terms of payment will be defined according to the nature of the requested studies.

The per diem rates reflected in the supply agreements are ceiling rates. Travel and living expenses will be paid based on the current Treasury Board guidelines. No travel and living expenses will be paid for work carried out within a 50-kilometre radius. Travel and living expenses must be approved by TC's project officer. TC will not pay for wait times due to adverse weather conditions. TC will only pay for expenses actually incurred.

9. INTELLECTUAL PROPERTY

Ownership of any intellectual property resulting from this contract will be vested with the Government of Canada (Transport Canada). This includes, but is not limited to, reports, technical documentation and information, inventions, prototypes, models, software, codes and manuals.

10. DISSEMINATION OF PROJECT RESULTS

Suppliers are encouraged to make their research public. However, they must first obtain written authorization from TC's environmental project officer. This requirement applies to all types of publications, regardless of the medium used (paper, posters, talks on CD-ROM, lectures, etc.). The publication must cite Transport Canada and the copyrights must be attributed to the Government of Canada as follows: © *year Government of Canada (Transport Canada Transportation Development Centre)*. A version of the documents intended for publication or distribution must be submitted to TC's environmental project officer sufficiently in advance so that the project officer can examine them in detail.

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APPENDIX 1

1. CONTEXT

The purpose of this call for tenders is to establish standing offers with suppliers that are capable of providing Transport Canada (TC) with the following services: environmental assessments, preparation of applications for authorization under Section 35 of the *Fisheries Act*, biological inventories, development of compensation projects (*Fisheries Act* (FA) and *Federal Policy on Wetland Conservation*) and airport wildlife management. The selected suppliers must be able to fulfill mandates as stipulated in the Terms of Reference. Call-ups to this standing offer will be established at a later date by TC's project officer.

The sites managed by TC are ports and airports in different locations throughout Quebec. The list of TC's main port and airport sites is presented in Appendix 1-B. It is important to mention that several sites are in remote areas, such as northern Quebec, Basse-Côte-Nord and Gaspésie.

2. CONTENTS OF THE PROPOSALS

Proposals must contain two main parts: the technical proposal and the financial proposal.

2.1. Technical Proposal

The technical proposal must include the following elements: the approach and methodology used to reach the objectives described in the Terms of Reference, the firm's experience in the form of project sheets (minimum font size 11 point, minimum margin width 2.5 cm), the organization chart for the work team and a short summary of each key member's résumé, as well as their role in the future mandates. The proposal must not exceed 20 pages and must be printed on both sides of the page, on paper having at least 30% recycled fibre content.

The proposal must include the points presented in Section 3, "Scope" of the Terms of Reference. TC must receive four (4) hard copies of the technical proposal.

2.1.1. Understanding of TC's Environmental Responsibilities on its Lands

The information supplied in this section must help evaluate the bidder's understanding of the environmental legislation that governs the management of TC's properties. The legislative context to cover in this section is limited to the legislation applicable to the present standing offer.

2.1.2. Understanding of the new regulatory provisions on airport wildlife planning and management in the *Canadian Aviation Regulations*, Part III, Subpart 2 – Airports.

The information supplied in this section must help evaluate the bidder's understanding of the objectives and requirements of an airport wildlife management plan, as described in the "Template for the Development of an Airport Wildlife Management Plan" developed by Transport Canada's Civil Aviation directorate (in Appendix 1-A).

Bidders must demonstrate that they understand the regulatory provisions in parts A and B of the "Template for the Development of an Airport Wildlife Management Plan" in Appendix 1-A.

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2.1.3. Approach and Methodology

This section must provide, for each activity described in Section 3 – “Scope” of the Terms of Reference, a broad outline of the approach that will be taken to carry out the specified work. The approach must include the methodology adopted, the activities planned and scope of the tasks to be completed by each workforce category or each person.

Sufficient detail must be provided to permit a thorough understanding of how the work will be carried out. For example, the manner in which the elements will be interpreted to reach the set objectives (impact assessment, calculation and/or modelling methods, factors considered, mitigation measures, site visits, inventory-taking methods, etc.)

2.1.4. Bidding Firms' Expertise

The firms must clearly demonstrate that they have the following expertise:

- Environmental assessment (EA) of projects under the *Canadian Environmental Assessment Act* (CEAA, 2012) and Section 22 and 31.1 of the *Environment Quality Act*;
- Development and implementation of environmental monitoring and/or follow-up programs;
- Preparation of applications for review and authorization under Section 35 of the *Fisheries Act*. Preparing applications for authorization includes conducting research, documenting and proposing fish habitat compensation projects;
- Development of wildlife and/or plant compensation projects aiming mainly to compensate for the loss/deterioration of fish habitats or the loss/deterioration of wetlands;
- Characterization of plants and wildlife in aquatic and terrestrial environments. Characterization experience in aquatic environments must include diving and taking videos underwater;
- Identification, delineation and description of wetlands and development of management plans to conserve such environments;
- Assessment of the hazards posed by wildlife in airport environments (description of the species posing a risk, identification and characterization of the hazards, risk assessment) and preparation of wildlife management plans (determination of management activities, monitoring plan, performance indicators, communication procedures, training plan);
- Capacity to offer services in both official languages; and
- Access to a civil engineering service will be considered an asset.

The firms must present 10 project sheets describing projects they carried out. The presented projects must have been carried out by at least one member of the work team proposed for this standing offer. **The team member must not necessarily be a key team member.**

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The project sheets must include the following:

- Two EAs carried out under the CEAA, with at least one EA carried out under Section 67 of the CEAA (2012). An EA carried out under CEAA for a project on federal lands but before the entry into force of CEAA (2012) would satisfy this criterion for project sheets, however the EA would have to have taken place within the last five (5) years.
- Two large-scale EAs (one environmental assessment carried out under Section 31.1 of Quebec's *Environment Quality Act* and one carried out for a project under the CEAA 2012). An EA carried out under CEAA for a project listed within the Comprehensive Study List Regulations (before the entry into force of CEAA 2012), satisfies this criterion for project sheets, however the EA must have been carried out within the five (5) last years;
- Two EAs carried out in an aquatic environment;
- A project done in Québec involving preparing an application for authorization under Section 35 of the *Fisheries Act*, which includes developing a compensation project;
- A project done in Québec involving identifying, delineating and characterizing wetlands, as well as developing a compensation project for the loss of wetlands;
- A project involving the development of a management plan aiming to conserve a wetland;
- A project involving preparing an environmental monitoring program;
- A project involving developing and implementing an environmental follow-up program spanning more than two years;
- A project involving taking plant and wildlife inventories in a terrestrial environment;
- A project involving taking plant and wildlife inventories in an aquatic environment; and
- Two projects involving preparing a management plan for wildlife posing a risk for human safety, with at least one carried out in an airport environment.

Each project sheet must contain the following information:

- Mandate and type of study conducted for this project;
- Date the project was carried out;
- Duration and value of the mandate;
- Description of the project evaluated;
- Personnel assigned to the project and their role.

Ideally the projects presented must have been carried out in Québec since the call-ups to this standing offer will all be carried out in Québec. However, Transport Canada accepts that the supplier presents a maximum of 3 out of 10 projects that have taken place in

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other Canadian provinces. This implies that a minimum of 7 of the 10 projects presented must have taken place within the province of Québec. It's important to note that Transport Canada will not accept projects that have taken place outside of Canada. In addition, the suppliers must present at least one large scale environmental assessment project done under article 31.1 of Québec's Environmental Quality Act and one project implicating the identification, delineation and description of wetlands and development of management plans to conserve such environments carried out in Québec.

Firms that have not clearly demonstrated all of the required competencies will automatically be screened out of the evaluation process for this call for tenders.

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2.1.5. Work Team Members' Experience and Qualifications

Bidders must provide a description of the proposed work team's organization (organization chart), as well as a list of the responsibilities assigned to each team member. They must also include a brief summary of each key team member's qualifications and relevant experience, as well as their role in future mandates.

The **work team Director** must demonstrate the following competencies:

- Have at least 10 years of experience supervising environmental assessments (EA);
- Have supervised EAs under the CEAA and the Environment Quality Act (EQA);
- Have supervised large-scale EAs or impact assessments (environmental assessment carried out under Section 31.1 of Quebec's *Environment Quality Act* and/or for a project under the CEAA 2012);
- Have supervised projects involving a wildlife and/or plant management component;
- Have supervised projects involving an application for authorization under Section 35 of the *Fisheries Act* (including a compensation project);
- Have supervised projects with a habitat compensation component for the destruction of wetlands;
- Have supervised projects involving the development of environmental monitoring and follow-up programs;
- Have public consultation experience;
- Hold a degree from a recognized university in biological or natural sciences, or another relevant scientific discipline; and
- Be bilingual.

The **project manager – environmental assessments** must demonstrate the following competencies:

- Have more than 10 years of experience carrying out environmental assessments (EA);
- Have supervised at least 5 EA projects in the last 5 years. The project manager must have supervised a minimum of one (1) EA under the CEAA and one (1) EA under the EQA within the last three (3) years;
- Have carried out EAs under the CEAA and EQA;
- Have supervised large-scale environmental assessments (environmental assessment carried out under Section 31.1 of Quebec's *Environment Quality Act* and/or under the CEAA 2012);
- Have supervised or prepared applications for authorization under Section 35 of the *Fisheries Act* (including a compensation project);

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- Have supervised or carried out projects with a habitat compensation component for the destruction of wetlands;
- Have carried out environmental assessments involving projects in aquatic environments (i.e. dredging, port projects, breakwaters, marinas, etc.);
- Have supervised the development or developed environmental monitoring and follow-up programs; and
- Hold a degree from a recognized university in environmental science, earth sciences, biological or natural sciences, environmental engineering or another relevant scientific discipline.

The **project manager – plants and wildlife** must demonstrate the following competencies:

- Have supervised at least 5 projects involving plant and/or wildlife characterizations in the last 3 years. These characterizations must have taken place in terrestrial (minimum one (1) project) and aquatic environments (minimum one (1) project). The characterization experience in an aquatic environment must include realization and/or experience subcontracting diving and underwater video-taking activities;
- Have helped develop compensation projects for work that caused “serious harm to fish” under Section 35 of the *Fisheries Act*. Participation in compensation projects for projects that involved the destruction of wetlands will be considered an asset;
- Have participated in projects whose objective was to identify species at risk and ensure their conservation;
- Have participated in projects involving the environmental follow-up of biological components in the environment;
- Have helped develop wetland conservation management plans; and
- Hold a degree from a recognized university in biological or natural sciences, or another relevant scientific discipline.

The **project manager – development of wildlife management plans** must demonstrate the following competencies:

- Have at least 10 years of wildlife management experience;
- Have developed at least 3 airport wildlife management plans;
- Have knowledge of, and expertise in, airport wildlife management;
- Hold a degree from a recognized university in biological or natural sciences, or another relevant scientific discipline.

The work team must demonstrate the following competencies:

- At least one member of the work team must have experience developing environmental monitoring programs for site work;

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- At least one member of the work team must have plant and wildlife characterization experience in an aquatic environment;
- At least one member of the work team must have experience identifying, delineating and describing wetlands using recognized sampling methods, such as the simplified or expert botanical method and developing wetland conservation plans; and
- At least one member of the work team must be a biologist.

All members of the work team that need to circulate on a construction site must hold a certificate issued by ASP Construction attesting that they have taken the “General Health and Safety on Construction Sites” course.

The individuals assigned to the team must have the scientific and technical knowledge required to fulfill the mandate.

In order to demonstrate that the proposed personnel meet all the requirements mentioned, bidders must provide:

A résumé for each proposed person (team leaders and team members), indicating their education, work experience and any other relevant details, clearly demonstrating that the individual in question has the necessary qualifications. The résumés must be appended to the technical proposal. A list of the subsidiary resources and their résumés must also be appended.

When applicable, a list of subcontractors must be provided, indicating their role and responsibilities in the framework of the future mandates.

It is important to demonstrate that the key team members have experience carrying out projects covering all of the objectives set out in the Terms of Reference.

Note that once firms have been selected following this call for tenders, no member of the proposed team may change without prior approval by the Transport Canada contracting authority. New members will be evaluated according to the same criteria as in the call for tenders.

All work teams that do not meet these requirements will automatically be refused.

2.2. Financial Proposal

The bidder must submit a financial proposal with hourly rates (see Table I). TC must receive two hard copies of the proposal.

The supplier cannot claim any amount for preparing this or any subsequent proposals.

2.3. Proposal Assessment Criteria

The technical proposals will first be evaluated for quality according to the evaluation criteria grid in Table II. In order to be given further consideration, a technical proposal must obtain an overall grade of at least 80%, for a total of 32 points out of 40.

Then, the financial proposals from the bidders who received the minimum overall score will be opened. The financial proposals will be evaluated by comparing the sum total of

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the hourly rates indicated by each supplier (see Table I). The lowest financial proposals will be selected for this standing offer (maximum of 4 standing offer contracts awarded).

Transport Canada reserves the right to reject any bid that is incomplete or fails to obtain the passing grade in any of the specified categories.

3. HEALTH AND SAFETY

TC recognizes that it has an important role to play in protecting the health and safety of all those working on government land that is the site of construction work. It also recognizes that federal and private sector employees are entitled to the full protection afforded by the *Canada Occupational Health and Safety Regulations*.

To meet this requirement and to better protect the health and safety of all people on federal construction sites, TC is committed to complying with provincial and territorial occupational health and safety acts and regulations, in addition to the *Canada Occupational Health and Safety Regulations*.

During site visits, the supplier must wear all required personal protective equipment. If visits are made to construction sites, the supplier must hold a certificate issued by ASP Construction attesting that he or she has taken the "General Health and Safety on Construction Sites" course.

In order to validate that everything is in place to ensure the health and safety of the suppliers and their subcontractors, a health and safety plan will be required before the start of the site work.

4. ATTESTATION

The following attestation must be submitted with the proposal, on a separate sheet.

"We hereby certify that we have verified all information provided in the appended résumés, especially with respect to education, experience and work history, and that the information is accurate. If we are awarded the contract, we further certify that the personnel proposed and all designated subcontractors will be available to perform the work described herein as and when the project officer so requests."

Signature by the firm's authorized representative

5. CONTRACTING AUTHORITY

The contracting authority for this call for tenders will be:

Sonia Lemire
Senior Contracting and Materiel Officer
Contracting and Materiel Services
700, Leigh Capreol Place
Dorval, Quebec
H4Y 1G7
Tel.: 514-633-2820
E-mail: sonia.lemire@tc.gc.ca

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TABLE I: FEES

i) HOURLY RATES

TITLE AND DUTIES	HOURLY RATE
Work team director	
Project manager – environmental assessments	
Project manager – plants and wildlife	
Project manager – development of wildlife management plans	
Biologist	
Technician	
Engineer	
Geographer	
Hydrogeologist	
Geologist	
Cartographer	
Administrative assistant	
Diver	
TOTAL AMOUNT OF THE HOURLY RATES	

Note 1: The financial proposals will be evaluated by comparing the total amount of the hourly rates indicated by each supplier. The lowest financial proposals will be selected for this standing offer (maximum of 4 standing offers will be awarded) and will be applied only to the tenders with an overall score of at least 80% for the evaluation criteria.

Note 2: Transport Canada will not pay for wait times due to adverse weather conditions. Transport Canada will only pay for expenses actually incurred.

Note 3: For travel and living expenses, the maximum authorized will be in accordance with current Treasury Board guidelines.

Note 4: Vehicle rental, accommodation and air travel costs will be reimbursed if pre-approved by the project officer and upon presenting supporting documents.

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TABLE II: EVALUATION CRITERIA

CRITERIA		Points	Yes/No	Score
1.	Understanding of TC's environmental responsibilities on its lands	4	N/A	
1.1	Understanding of the CEAA 2012	1	N/A	
1.2	Understanding of the <i>Fisheries Act</i>	1	N/A	
1.3	Understanding of the <i>Species at Risk Act</i>	1	N/A	
1.4	Understanding of the <i>Federal Policy on Wetland Conservation</i>	1	N/A	
2.	Understanding of the new regulatory provisions on airport wildlife planning and management – <i>Canadian Aviation Regulations</i>	3	N/A	
2.1	Understanding of the <i>Canadian Aviation Regulations</i> , Part III, Subpart 2 - Airports	3	N/A	
3.	Firms' expertise (evaluated via project sheets)			
3.1	Environmental assessment carried out under CEAA (1 experience) and Section 67 of the CEAA 2012 (1 experience). An EA carried out under CEAA for a project on federal lands but before the entry into force of CEAA (2012) is acceptable, however the EA must have been carried within the last five (5) years.	N/A	yes/no	
3.2	Large-scale environmental assessments (1 experience done under article 31.1 of Québec's Environmental Quality Act and 1 experience of a designated project under the CEAA 2012). An EA carried out under CEAA for a project listed within the Comprehensive Study List Regulations (before the entry into force of CEAA 2012), is acceptable, however the EA must have been carried out within the five (5) last years	N/A	yes/no	
3.3	Environmental assessments in an aquatic environment (2 experiences)	N/A	yes/no	
3.4	Project sheet that includes developing and implementing an environmental monitoring program (1 experience)	N/A	yes/no	
3.5	Project sheet that includes developing and implementing an environmental follow-up program spanning more than 2 years (1 experience)	N/A	yes/no	
3.6	Application for authorization under the <i>Fisheries Act</i> , including developing a compensation project (1 experience)	N/A	yes/no	
3.7	Identification, delineation and characterization of wetlands and development of a project to compensate for the loss of wetlands for a project that took place in Québec (1 experience)	N/A	yes/no	

Transport Canada - Environmental Affairs

TABLE II: EVALUATION CRITERIA

CRITERIA		Points	Yes/No	Score
3.8	Development of a wetland conservation management plan for a project that took place in Quebec (1 experience)	N/A	yes/no	
3.9	Plant and wildlife characterization in an aquatic environment (1 experience)	N/A	yes/no	
3.10	Plant and wildlife characterization in a terrestrial environment (1 experience)	N/A	yes/no	
3.11	Preparation of airport wildlife management plans (2 experiences)	N/A	yes/no	
3.12	Minimum of seven out of ten projects carried out in Quebec	N/A	yes/no	
3.13	Project sheets concern projects carried out by the members of the current team	N/A	yes/no	
4.	Team members' qualifications and experience			
4.1	The work team director has more than 10 years of experience supervising EAs carried out under the CEAA and the EQA, including several large-scale EAs	N/A	yes/no	
4.2	The work team director has supervised projects involving a wildlife and/or plant management component	N/A	yes/no	
4.3	The work team director has supervised projects involving preparing an application for authorization under the <i>Fisheries Act</i>	N/A	yes/no	
4.4	The work team director has supervised projects involving a habitat compensation project for the destruction of wetlands	N/A	yes/no	
4.5	The work team director has supervised projects involving developing environmental monitoring and follow-up programs	N/A	yes/no	
4.6	The work team director has public consultation experience	N/A	yes/no	
4.7	The work team director holds a university degree in a relevant field	N/A	yes/no	
4.8	The work team director is bilingual	N/A	yes/no	
4.9	The project manager – EA has more than 10 years of experience carrying out EAs (under the CEAA and the EQA) and has supervised at least 5 EA projects in the last 5 years. However, the project manager must have supervised a minimum of one (1) EA for each of these two Acts within the last three (3) years.	N/A	yes/no	
4.10	The project manager – EA has supervised large-scale EAs	N/A	yes/no	

Transport Canada - Environmental Affairs

TABLE II: EVALUATION CRITERIA

CRITERIA	Points	Yes/No	Score
4.11 The project manager – EA has supervised or prepared applications for authorization under Section 35 of the <i>Fisheries Act</i> for projects involving the development of compensation projects	N/A	yes/no	
4.12 The project manager – EA has supervised or carried out projects with a compensation component for the destruction of wetlands	N/A	yes/no	
4.13 The project manager – EA has supervised or carried out EAs involving projects in aquatic environments	N/A	yes/no	
4.14 The project manager – EA has supervised or developed environmental monitoring and follow-up programs	N/A	yes/no	
4.15 The project manager – EA holds a university degree in a relevant field	N/A	yes/no	
4.16 The project manager – plants and wildlife has supervised or carried out at least 5 projects involving wildlife and/or plant characterizations in the last 3 years (terrestrial and aquatic environments). The project manager – plants and wildlife must minimally possess one (1) wildlife or plant characterization experience in an aquatic environment as well as one (1) wildlife or plant characterization experience in a terrestrial environment and this, within the last three years.	N/A	yes/no	
4.17 The project manager – plants and wildlife has supervised or carried out projects involving the development of compensation projects for the loss of habitats (fish habitats and wetlands). The project manager must absolutely have supervised or carried out compensation projects for the loss of fish habitat within the last three (3) years. Should the considered project manager not possess this experience, this will be an exclusion factor from the present call for tenders. However, the absence of experience in the supervision and carrying out of wetland habitat compensation projects within the last three (3) years would not be a factor for exclusion from the present call for tenders but such an experience will be considered an asset.	N/A	yes/no	
4.18 The project manager – plants and wildlife has supervised or carried out projects whose objective was to identify species at risk and ensure their conservation	N/A	yes/no	
4.19 The project manager – plants and wildlife has supervised or carried out projects involving the environmental follow-up of biological components	N/A	yes/no	
4.20 The project manager – plants and wildlife has supervised or carried out wetland conservation management plants	N/A	yes/no	
4.21 The project manager – plants and wildlife's experience in characterization of aquatic environments must include either performing or subcontracting diving and underwater video-taking	N/A	yes/no	
4.22 The project manager – plants and wildlife holds a university degree in a relevant field	N/A	yes/no	
4.23 The project manager –wildlife management plan development has more than 10 years of wildlife management experience	N/A	yes/no	

Transport Canada - Environmental Affairs

TABLE II: EVALUATION CRITERIA

CRITERIA	Points	Yes/No	Score
4.24 The project manager –wildlife management plan development has developed a minimum of 3 airport wildlife management plans	N/A	yes/no	
4.25 The project manager –wildlife management plan development has airport wildlife management knowledge and expertise	N/A	yes/no	
4.26 The project manager –wildlife management plan development holds a university degree in a relevant field	N/A	yes/no	
4.27 At least one member of the work team has environmental monitoring and/or follow-up experience	N/A	yes/no	
4.28 At least one member of the work team has experience characterizing plants and wildlife in an aquatic environment	N/A	yes/no	
4.29 At least one member of the work team has experience identifying, delineating and describing wetlands with known sampling methods and developing wildlife conservation plans	N/A	yes/no	
4.30 At least one member of the work team is a biologist	N/A	yes/no	

Transport Canada - Environmental Affairs

TABLE II: EVALUATION CRITERIA

CRITERIA	Points	Yes/No	Score
5. Description of the approach and methodology used to meet the objectives listed in the Terms of Reference	30	N/A	
5.1 Conducting environmental assessments	5	N/A	
5.2 Developing and implementing an environmental monitoring and/or follow-up program	5	N/A	
5.3 Preparing applications for authorization under Section 35 of the <i>Fisheries Act</i>	5	N/A	
5.4 Conducting characterizations in aquatic and terrestrial environments (biological inventories)	5	N/A	
5.5 Identifying and managing wetlands	5	N/A	
5.6 Preparing airport wildlife management plans	5	N/A	
6. Overall quality of the technical proposal	3	N/A	
Total	40	N/A	

Note 1: In order to be given further consideration, a financial proposal must obtain an overall score of at least 80%, for a total of 32 points out of 40.

Note 2: The presented projects must have been carried out in Quebec.

Note 3: Firms that have not clearly demonstrated all of the required competencies will automatically be screened out of this call for tenders process.

Note 4: Any work teams that do not meet the requirements will automatically be eliminated.

Note 5: The usual working language is French, but some documents could be required in both official languages.

**APPENDIX 1-A – Template for the Development of an Airport Wildlife
Management Plan**

Transport Canada - Environmental Affairs

**Template for the Development of a
Airport Wildlife Management Plan**

for

XXX Regional Airport

Address: _____

Phone: _____

Fax: _____

This document was prepared by:

Current date (date of this version)

To be reviewed a minimum of every two (2) years

Question or Comments should be directed to:

***Sections provided in [square brackets and/or italics] are guidance notes to be deleted
when this template is used***

Transport Canada - Environmental Affairs

Distribution List:

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

Name and Title	Agency	Copies

SECTION A: RISK ASSESSMENT

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.

Wildlife Management Plan Template

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 XXX 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 **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:

Wildlife Management Plan Template

- 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.*

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.

Wildlife Management Plan Template

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.

Description of Airport Operations

[Insert here a brief description of the airport location (e.g., surrounding land use, geography and elevation, but not detailed biophysical characteristics), information on airport ownership, airport operator, typical traffic profile, runway characteristics, navigation aids, UNICOM information, other facilities, hours of operation and any other pertinent general information.]

Wildlife Management Plan Template

Figure 1. Location Map

[Provide here a general location map of the airport, typically at 1:50,000 on a topographic map base or similar.]

Wildlife Management Plan Template

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.

[Insert here comments referring to Table 1, characterize the general traffic profile and any higher risk flights such as MEDIVAC, air shows etc.]

Wildlife Management Plan Template

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 <i>[Indicate year]</i>	Trend in Movements	Comments
Piston under 5700 kg	<i>[Indicate number]</i>	<i>[General notation of forecast use]</i>	• <i>[E.g., seasonal or weekend differences]</i>
Piston over 5700 kg			
Helicopter			
Turbo prop under 27000 kg			
Turbo Jet			
<i>[others]</i>			

Table 2. Itinerant Aircraft Movements

Classification	Annual Movements <i>[Indicate year]</i>	Trend in Movements	Comments
Piston under 5700 kg	<i>[Indicate number and year]</i>	<i>[General notation of forecast use]</i>	<i>[Seasonal, or weekend data]</i>
Piston over 5700 kg			
Helicopter			
Turbo prop under 27000 kg			
Turbo prop over 27000 kg			
Turbo Jet			
Turbo fan			
<i>[others]</i>			

The airport typically receives between **[xxx]** and **[xxx]** movements of air traffic per year.

Wildlife Management Plan Template

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

[The examples of reports provided below are to be substituted.]

Document/Source	Type of Information	Located
<ul style="list-style-type: none"> • <i>XXX Municipal Airport: An Assessment of Impacts on Wetland and Aquatic Resources. XYZ Consultants 2002. Report prepared for the airport.</i> 	<ul style="list-style-type: none"> • <i>Flora and fauna of airport; wildlife hazards, review wildlife management actions taken</i> 	<ul style="list-style-type: none"> • Airport office
<ul style="list-style-type: none"> • <i>Wildlife Management database</i> 	<ul style="list-style-type: none"> • <i>Detailed information on White-tailed Deer and Coyote occurrence and location data. Also data on wildlife kills conducted under permits</i> 	<ul style="list-style-type: none"> • Airport office

Table 4. Sources for Wildlife Information – Outside the Airport

Document/Source	Type of Information	Located
<ul style="list-style-type: none"> • <i>Regional Conservation Authority</i> 	<ul style="list-style-type: none"> • <i>Limited available information</i> 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • <i>Local naturalist club</i> 	<ul style="list-style-type: none"> • <i>Some information on birds of the site, reported in existing documents</i> 	<ul style="list-style-type: none"> •
<ul style="list-style-type: none"> • <i>Audubon Christmas Bird Count (CBC) data</i> 	<ul style="list-style-type: none"> • <i>Several CBCs in area providing information on typical winter birds in area</i> 	<ul style="list-style-type: none"> • <i>On-line at: http://cbcaudubon.org:90/appportal/</i>

Wildlife Management Plan Template

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

Document/Source	Type of information	Located
<i>Provincial Natural Heritage Information Centre</i>	Maintains occurrence data for rare species	
<i>Federal Species at Risk data, COSEWIC reports</i>		
<i>Local Conservation Authority</i>		
<i>Local Naturalist Club database</i>		
<i>NGOs</i>		

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 1985. [**Source from Transport Canada and airport files.**]

Table 6. Strike Data for XXX Airport

Date	Aircraft	Wildlife Species and Number	Phase of Operation	Effect on flight	Comments

**Airport strike history reports can be obtained from Transport Canada upon request.

At this airport, the total number of wildlife strikes per 10,000 movements prior to the implantation of this regulation has not been recorded [**or insert strike rate**]. 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.

Wildlife Management Plan Template

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.

Wildlife Management Plan Template

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

On the Airport

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

[Figure 2 should be an aerial photograph or base mapping of the airport at 1:10,000 or better, with primary wildlife habitats and vegetation communities delineated. Habitats could include for example: short grass meadow, long grass meadow, shrub wetland, marsh, ponds, deciduous forest, buildings, etc. Where provincial standards exist for describing vegetation communities, these could be used. Text should indicate which are the most common habitats occurring at the airport.]

This would be followed by a table listing species of wildlife, separated into bird, mammal and other groupings. Thirty or more bird species might be found and might include species such as: Canada Goose, Ring-billed Gull, Mew Gull, European Starling or Horned Lark; while possible mammals found might include: Mule Deer, Red Fox, Northern Raccoon or Meadow Vole. Associated with each species listed, will be information on the seasonal occurrence, abundance, and location of use within the airport lands. Text should make mention of the commonest species found as well as addressing regulated species.]

Vegetation

Overall the vegetation communities other than the extensive grassed areas, are....

Wildlife Management Plan Template

Figure 2. Coarse Wildlife Habitat Mapping

Wildlife Management Plan Template

Breeding Birds

Habitat for Migrant Birds

Winter Wildlife Habitat

Amphibians and Reptiles

Mammals

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

[In this table list all species, not just hazardous ones; some examples are provided below in each category.]

Wildlife Management Plan Template

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

Common Name	Scientific Name	Seasonal Occurrence	Locations, Abundance
Birds			
<i>Great Blue Heron</i>	<i>Ardea herodias</i>	<i>Regular March to November</i>	<i>Low numbers, ponds, ditches with amphibians or fish, flying over airfield</i>
<i>Canada Goose</i>	<i>Branta canadensis</i>	<i>March to December</i>	<i>Attempts to breed at ponds, non-breeders sometimes forage airside on turf, fly-overs</i>
<i>Ring-billed Gull</i>	<i>Larus delawarensis</i>	<i>February to November</i>	<i>Occasionally forages airside on pavement or short grass, usually small flocks, frequent fly-overs, often present at landfill, associated flightlines poorly known</i>
<i>Downy Woodpecker</i>	<i>Picoides pubescens</i>	<i>Year round</i>	<i>Breeds, low numbers in treed areas</i>
<i>Barn Swallow</i>	<i>Hirundo rustica</i>	<i>April to September</i>	<i>Occasionally breeds in buildings, regular over airside areas July to September, sometimes in moderate-sized flocks (e.g., 50). In cooler periods will rest on runway, poor response to pyros</i>
<i>Red-winged Blackbird</i>	<i>Agelaius phoeniceus</i>	<i>February to December</i>	<i>Breeds, migrants, prefers longer grass, feeds on insects and grass seeds, flocks, may be numerous, often seen crossing airfield, sometimes feeding in long or short grass</i>
<i>Snow Bunting</i>	<i>Plectrophenax nivalis</i>	<i>December to April</i>	<i>Winter, migrants, feeds airside, runway, flocks, sometimes in larger numbers (100s), prefers seed heads over snow</i>
Amphibians and Reptiles			
<i>Northern Leopard Frog</i>	<i>Rana pipiens</i>	<i>April to October</i>	<i>Breeds in ponds, forages airside, sometimes numerous</i>
<i>Common Snapping Turtle</i>	<i>Chelydra serpentina</i>	<i>April to October</i>	<i>Occasionally seen crossing runway from ponds, especially in early June when nesting</i>
Mammals			
<i>American Beaver</i>	<i>Castor canadensis</i>	<i>March to December</i>	<i>Present and persistent in wetlands and drainage features mostly not airside, numbers variable, may be controlled by Coyotes</i>
<i>White-tailed Deer</i>	<i>Odocoileus virginianus</i>	<i>Year round</i>	<i>Frequent outside airfield, now rarely airside</i>

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 **[Or further if thought to be relevant.]**

[A topographic map or aerial photograph mosaic should be provided with attractants indicated (e.g., wastewater discharge plants, sewage lagoons, crop production areas, recreational sites, managed and supplemental natural habitats). Land uses falling under the extremely hazardous category type (i.e., food waste disposal sites, outdoor composting areas, commercial fish plants or other areas where potential wildlife foods are exposed) should also be indicated with a separate key on this map. Text should describe and summarize each of the hazardous lands present.]

Of particular note is the landfill located..... Agricultural fields can attract birds at certain times (e.g., April for worms and fall during harvesting or ploughing).... several known and regular hotspots are indicated on Figure 3.

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.

Wildlife Management Plan Template

Figure 3. Locations of Key Hazardous Land Uses

Wildlife Management Plan Template

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 XXX Airport

Species	On-site Issue	Off-site Issue
Geese (all)	<i>Yes</i>	<i>Yes</i>
Gulls (all)		
Hawks (buteos)		
Ducks (all)		
Rock Dove		
Eagles (both)		
Sandhill Crane		
Sparrows (all)		
Shorebirds (all)		
Blackbirds/starlings (all)		
Swallows (all)		
Mourning Dove		
Hérons (all)		
Turkey Vulture		
Am. Kestrel		
Wild Turkey		
White-tailed Deer/Ungulates		
Coyote/canids		
<i>[Supplement with any relevant additional species]</i>		

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.

Wildlife Management Plan Template

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.

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.

[Some example sheets are provided, text is to be substituted.]

Wildlife Management Plan Template

Canada Goose	
Mass/Flocking Rank (1-6): 1	Species Protection Status: <i>Federal Migratory Bird Treaty Act</i>
Seasonality (time of year): <i>March to early December, generally absent mid-June to late July, but persistent in April. Very few after freeze-up until the following thaw.</i>	
Temporal (time of day): <i>Not known. Generally tends to be more active just before dusk and after dawn.</i>	
Spatial (where in the area the hazard exists, hotspots): <i>Uses open crop fields in fall, flooded fields in spring, attempts to nest in ponds on site (usually shot under permit). Will forage on airfield. Frequently on river within high risk zone. Concentration at pond near Xyz Creek may overfly airport. May use racetrack (unknown), frequent on Xyz River near hydroline.</i>	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): <i>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.</i>	
Discussion of Numbers (peak counts, low counts, breeding pairs): <i>Few counts available, up to three or four pairs have attempted to nest, flocks usually less than 40.</i>	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): <i>Feeding on turf and on croplands. Nesting and attraction to nest sites in wetlands.</i>	
Sources of Information for Species in this Area (list reports and other sources): <i>None known.</i>	
Strike Summary: <i>One strike reported.</i>	
Other Comments: <i>Breeding birds controlled by killing, hazing works for visitors, but special concerns remain for fly-throughs.</i>	

Wildlife Management Plan Template

Gulls (mostly Ring-billed Gull)	
Mass/Flocking Rank: <i>3 for Ring-billed Gull, 2 for Herring Gull</i>	Species Protection Status: <i>Federal Migratory Bird Treaty Act</i>
Seasonality (time of year): <i>February to November, less common from late April to late July, most common in spring and fall.</i>	
Temporal (time of day): <i>Move from roosts to feeding areas daily.</i>	
Spatial (where in the area the hazard exists, hotspots): <i>Concentrate at wet fields, hay while being cut, ploughing operations, landfill. Forage on runway for worms (especially during and after wet weather), short and mown grass for invertebrates. May move across high risk zones, may follow river when moving from landfill to City.</i>	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): <i>Flocking, use of airside areas, flightlines may be across high risk areas.</i>	
Discussion of Numbers (peak counts, low counts, breeding pairs): <i>No counts available.</i>	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): <i>Food sources as listed above, loafing on runway, flightlines to roost and feeding areas (not known).</i>	
Sources of Information for Species in this Area (list reports and other sources): <i>None known.</i>	
Strike Summary: <i>One significant strike, resulting in substantial engine damage.</i>	
Other Comments: <i>Need information on flightlines, numbers and movements to and from the local landfill site.</i>	

Wildlife Management Plan Template

Blackbirds (Red-winged Blackbird, Common Grackle, Brown-headed Cowbird)	
Mass/Flocking Rank: 4	Species Protection Status: <i>Provincial Fish and Wildlife Act</i>
Seasonality (time of year): <i>February to December.</i>	
Temporal (time of day): <i>All day, no details on daily timing of flocking behaviour in fall.</i>	
Spatial (where in the area the hazard exists, hotspots): <i>Over and around runways, grass areas, shrub thickets.</i>	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): <i>Flocking in fall, low flying, often crossing airfield. Flocks will also perch in trees and circle around any raptors in area.</i>	
Discussion of Numbers (peak counts, low counts, breeding pairs): <i>No counts available, some flocks can number hundreds of birds.</i>	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): <i>Seeds and short turf for feeding. Feeding on long and short grass. Some nesting, mainly in long grass and around ponds. Primary roost locations not known.</i>	
Sources of Information for Species in this Area (list reports and other sources): <i>None known.</i>	
Strike Summary: <i>No strikes known or reported.</i>	
Other Comments:	

Wildlife Management Plan Template

Great Blue Heron	
Mass/Flocking Rank: 2	Species Protection Status: <i>Provincial Fish and Wildlife Act</i>
Seasonality (time of year): <i>February to November.</i>	
Temporal (time of day): <i>All day.</i>	
Spatial (where in the area the hazard exists, hotspots): <i>Runways.</i>	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): <i>Low slow flight across airfield, low maneuverability.</i>	
Discussion of Numbers (peak counts, low counts, breeding pairs): <i>Usually present in low numbers (one to several).</i>	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): <i>Feeding on amphibians and fish etc., in ponds and ditches.</i>	
Sources of Information for Species in this Area (list reports and other sources): <i>2002 XYZ consultants report; OMNR.</i>	
Strike Summary: <i>One strike in 2004.</i>	
Other Comments:	

Wildlife Management Plan Template

White-tailed Deer	
Mass/Flocking Rank: 1	Species Protection Status: <i>Provincial Fish and Wildlife Act</i>
Seasonality (time of year): <i>Year round, less active mid-winter and rarely on the airside at that time.</i>	
Temporal (time of day): <i>Often active at dawn and particularly dusk.</i>	
Spatial (where in the area the hazard exists, hotspots): <i>Move from forested lands to forage airside, mostly within forest patches. Also use wetland ponds for feeding and avoiding biting insects in spring.</i>	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): <i>Groups encroaching on runway in poor light conditions and at night.</i>	
Discussion of Numbers (peak counts, low counts, breeding pairs): <i>No counts available.</i>	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): <i>Feeding on forbs and wetland plants, movement between forest blocks.</i>	
Sources of Information for Species in this Area (list reports and other sources): <i>OMNR, local hunters.</i>	
Strike Summary: <i>No strikes known or reported.</i>	
Other Comments: <i>Hunted annually on property. Generally considered the highest risk species at airports.</i>	

Wildlife Management Plan Template

American Beaver	
Mass/Flocking Rank: <i>Not applicable</i>	Species Protection Status: <i>Provincial Fish and Wildlife Act</i>
Seasonality (time of year): <i>April to November.</i>	
Temporal (time of day): <i>Not applicable.</i>	
Spatial (where in the area the hazard exists, hotspots): <i>Wetland ponds and drainage features.</i>	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): <i>Create ponded areas which attract hazardous wildlife species.</i>	
Discussion of Numbers (peak counts, low counts, breeding pairs): <i>No counts available.</i>	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): <i>Poor drainage, lots of poplar available.</i>	
Sources of Information for Species in this Area (list reports and other sources): <i>None known.</i>	
Strike Summary: <i>Not applicable, but species attracted to ponds have been struck.</i>	
Other Comments: <i>Regularly trapped.</i>	

Wildlife Management Plan Template

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		<i>[E.g., some MEDIVAC]</i>
2	Helicopter and Turboprop	Moderate		
3	Piston under 5700 kg	Low		

Wildlife Management Plan Template

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 and typical circling patterns where those patterns approach 500-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 XXX 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.

Wildlife Management Plan Template

Figure 4. Elevated Risk Zones

Wildlife Management Plan Template

Figure 5. Habitat Connectivity

Wildlife Management Plan Template

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 behaviour (H-M-L) based on the previous sections of this report. The following criteria are used to help assess the risk levels at this airport.

Wildlife Management Plan Template

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.

Wildlife Management Plan Template

Table 11. Risk Assessment Matrix for XXX 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 (XXX)	2 (XXX)	3 (X,XXX)
White-tailed Deer	1	100	1	<i>L</i>	<i>H</i>	<i>L</i>	<i>L</i>	<i>M</i>
Turkey Vulture	2/3	63	18	<i>L</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>L</i>
Canada Geese	1	52	2	<i>M</i>	<i>M</i>	<i>L</i>	<i>M</i>	<i>M</i>
Mallard and teal	2/3	37	5	<i>L</i>	<i>M</i>	<i>L</i>	<i>M</i>	<i>L</i>
Rock Dove	3	24	8	<i>M</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>L</i>
Ring-billed Gull	3	22	3	<i>H</i>	<i>H</i>	<i>L</i>	<i>M</i>	<i>M</i>
Great Blue Heron	2	22	17					
Coyote	1	20	6					
Killdeer	4	12	12					
Blackbirds	4	9	13					
Starlings	4	9	13					
Savannah Sparrow	6	4	11					
Snow Bunting	5	N/a	11					
Swallows	5	2	15					
Wild Turkey	1	N/a	20					

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.

Wildlife Management Plan Template

Table 12. Wildlife Management Priorities for XXX Airport

[Examples are provided in the following table, to be replaced with site specific data based on the previous sections of this plan.]

Management Priority	Species Group
High	<i>Canada Goose</i>
	<i>Ring-billed Gull</i>
Moderate	<i>White-tailed Deer</i>
	<i>Blackbirds</i>
Low	<i>Turkey Vulture</i>
	<i>Coyote</i>
	<i>Killdeer</i>

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/some/all 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, XXX are considered low priority, XXX moderate priority and XXX high priority.

SECTION B: AIRPORT WILDLIFE MANAGEMENT PLAN

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 XXX Airport Wildlife Management Plan.

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).

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	<ul style="list-style-type: none"> • Generally none within 365 m of a runway • Limit to: hay, alfalfa, flax, soy, fall rye, wheat, barley and other cereals, <u>not</u> corn or oats • Avoid ploughing – require night-time ploughing, haying; other harvesting controls and no standing bales
Grass	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Remove, including undergrowth and understorey layers • Reduce biodiversity, habitat niches
Infield perching features	<ul style="list-style-type: none"> • Remove • Apply spikes when required
Waste storage	<ul style="list-style-type: none"> • All disposal containers must be wildlife proof • Eliminate dumps on the airport
Outdoor picnic areas	<ul style="list-style-type: none"> • Signage • Provide wildlife proof garbage containers
All remaining habitats, airport perimeter	<ul style="list-style-type: none"> • Chain-link fencing, high-tensile fixed knot fencing, • ElectroBraid™ fencing, • Buried fences • One-way gates, cattle gates.
Aircraft	<ul style="list-style-type: none"> • Ensure that bird nesting does not occur within parked aircraft, generally from April 01 to July 30 in Canada.

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).

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.

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 [***Insert local CWS office***].

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. More information for Ontario can be accessed at <http://www.mnr.gov.on.ca/MNR/pubs/pubmenu.html>. The use of some chemicals may also be controlled, and provincial or territorial regulations should be consulted. ***[Insert provincial/territorial regulations that do apply here.]***

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. ***[Determine this and insert here.]***

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 be able to assist the land users is a useful start. Specific problems may indicate a need to contact individual land users.

Regulatory Agencies

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

Non-Governmental Organizations (NGOs)

Some of the larger national or provincial NGOs may be involved in habitat creation initiatives and maybe included in a stakeholder group (e.g., Ducks Unlimited Canada). Others, such as natural history groups or humane societies, may become important to the airport if wildlife control, especially lethal control, is included as part of the 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.

Determination of Wildlife Management Activities for XXX 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.

[The following sections must be developed from the previous information that has been presented in this document. Provided here are two fictitious examples of first priority and one each of second and third. These should be deleted and completed for your airport. Note that the most effective techniques are identified in TP11500E Wildlife Control procedures Manual (Transport Canada 2002)].

First Priority

Canada Goose

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 in the afternoons, when they move to a frequently used portion of the XYZ River. Geese occasionally forage on the airport grass and annually attempt to nest at the ponds. It is a large-sized bird, has flocking habits and a relatively slow flight. The species is generally present from March through December.

The following steps will be undertaken:

- 1. A zero-tolerance policy will be implemented for geese at the airport.*
- 2. The ponds on the airport will be filled to the extent possible.*
- 3. Ponds to remain for stormwater management will be overwired.*
- 4. Any future redesign of drainage features will minimize waterfowl habitat, steep sides (4 to 1), hard edges and no vegetation where possible, pipes should be used where possible.*
- 5. Wetland vegetation associated with drainage features will be cut and minimized in extent.*
- 6. Grass length at the airport in wetter areas that cannot be cut by traditional methods will be maintained at a minimum height of 30 to 50 cm.*
- 7. In short grass areas, fertilizer will not be part of the grass management regime.*
- 8. Local geese at the airport will be shot in March to prevent nesting and in the fall to reinforce deterrents.*
- 9. Pyrotechnics (reinforced with live shooting) will be used whenever geese are seen during wildlife patrols or reported by staff or pilots. Patrols specifically for geese will be increased during April and especially during August when geese begin to occur at the airport again after their flightless period.*

10. *A PowerPoint™ hazard awareness program will be developed for geese.*
11. *The awareness program will be presented to: a) the local municipality to seek assistance with managing the stormwater pond along Regional Road 28 (Figure 3 – Section A) and regional goose numbers in general; b) the adjacent golf course to see if there is mutual interest in goose management, and c) local farmers to encourage stubble ploughing and avoidance of grain crops, where feasible.*

A forb-rich grass management technique will not be an objective at this time, as this may increase use by small mammals, European Hare, White-tailed Deer and raptors.

Ring-billed Gull

Highest Airport Risk Ranking: Moderate

Management Priority: High

Summary:

This species was ranked high priority because it is frequently seen at the airport, feeds on worms and loafs on the runway. A medium-sized bird, it also has flocking habits and relatively slow flight. The species is present year round, with larger number in fall and early winter. It may fly across aircraft approach when birds are moving between the landfill and other attractants, or towards the City along the XYZ River, or between the City and XZY Lake (a potential seasonal roost). Insufficient data are available to be certain on flightlines and potential risks. There has been one serious strike at this airport involving an unidentified gull species.

The following steps will be undertaken:

1. *In the spring and fall, precipitation events that cause worms to emerge onto the runway and taxi surfaces in great numbers will result in mechanical sweeping to remove the worms.*
2. *Generally, short grass length at the airport will be increased to 12 cm and cut to a minimum of 9 cm.*
3. *The small ponds will be eliminated at the airport and/or overwired.*
4. *Gulls will be selectively shot at the airport to reinforce deterrents.*
5. *Pyrotechnics and report shells (reinforced with live shooting) will be used whenever gulls are seen during wildlife patrols. Patrols specifically for gulls will be increased when monitoring shows increased use of the airport.*

6. *All garbage bins on site will be wildlife proof.*
7. *Airport policy to ban feeding of wildlife by staff and visitors will be posted and initiated.*
8. *A PowerPoint™ hazard awareness program for gulls will be developed and presented to: a) the landfill operator with a request that the landfill prepare a Gull Management Plan (safety and liability will be stressed), and b) local farmers, primarily the two hotspots, to encourage night ploughing.*
9. *If deemed necessary, the airport will formally request a risk assessment for the gull problem, citing safety concerns. The airport will also ask to be circulated on any certification process for the landfill.*

Second Priority

White-tailed Deer

Highest Airport Risk Ranking: Moderate

Management Priority: Moderate

Summary:

This species is ranked moderate, rather than high, because the use of an ElectroBraid™ fence has reduced deer observations by 90% at the airport. 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 ponds, especially in summer, as well as long grass area, they use to frequently cross the airport area. They are infrequent or absent in typical winters.

The following steps will be undertaken:

1. *A zero tolerance policy for deer incursions will be continued.*
2. *The ElectroBraid™ fence will be inspected once daily and repairs made as needed, particular attention will be applied to crossings of drainage features.*
3. *Once weekly during the growing season, vegetation will be cut along the entire electric fence with a trimmer to avoid short circuits.*
4. *Interference by deep snow will be monitored and appropriate actions taken, this will mean the turning off of one or two strands, or the entire fence unless tracks indicate deer activity.*
5. *Long grass areas will be maintained at a height not exceeding 50 cm.*
6. *The small ponds will be eliminated at the airport or overwired.*

Third Priority

Coyote

Highest Airport Risk Ranking: Low

Management Priority: Low

Summary:

This species is ranked low, rather than moderate, because it is likely that only one or two pairs frequent the area. They also tend to displace Red Fox and control a number of other potentially hazardous species such as European Hare, Killdeer, nesting waterfowl, limit the abundance or prey for raptors (e.g., voles), or provide disturbance to White-tailed Deer. On balance, the active control of Coyotes is not currently anticipated unless dens are actually located on the site, but this could change if numbers increase or behaviour changes.

The following steps will be undertaken:

- 1. This species will be carefully monitored for changes in numbers or behaviour.*
- 2. Coyote dens on the airport property will be removed or destroyed in the early summer to reduce the potential for young, inexperienced animals wandering airside.*

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.

Daily Wildlife Management Log

The first step in a good monitoring program is good record-keeping. The most efficient manner to collate daily wildlife logs is using software specifically designed for the task. These programs can be purchased from several vendors (see Section K.3 of the *Wildlife Control Procedures Manual*). This airport will be purchasing a software program to record (for all target species listed in this report) the standard data that are suggested by Transport Canada in the sample field form of the Manual. This will include: date, start and finish, numbers and species, control activity, details of lethal control, results/evaluation, location of wildlife, weather, personnel, and other pertinent information.

Monthly Summary

At the end of each month, a written summary will be provided within the Wildlife Management Log 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 monthly summary provides an opportunity for any new information on policies, new laws, changes in the status of rare species known to frequent the airport, training programs or management reviews to be written and stored in a readily accessible location.

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. ***[Identify here which method this airport is going to implement.]***

When reporting a wildlife strike, the Transport Canada form titled [Bird/Wildlife Strike Report](#) number #51-0272 can be used and is available on-line at:

<http://www.tc.gc.ca/aviation/applications/birds/default.asp>

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 m of the runway centreline, for struck wildlife species. Notation will also be made of any animal remains that are considered non-strikes, prior to their removal.

Where the identity of remains of wildlife species that have been struck is in doubt, parts will be preserved for identification. After taking a digital photograph for the Wildlife Log, remains will be bagged in zip-lock bags (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@nsmnh.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.

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.

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.

[Summarize all proposed actions and steps required to ensure these actions are possible, e.g., permits, requisition of special equipment. The following sections are examples and they should be replaced with planned activities for this airport.]

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. *Efforts will be made to find a grass-cutting method for tall grass in wet conditions.*
7. *Wetland vegetation associated with drainage features will be cut and minimized.*
8. *Vegetation along the ElectroBraid™ fence will be cut as required and the fence will be checked daily.*
9. *Interference of the ElectroBraid™ fence by deep snow will be monitored and appropriate actions taken; this will mean the turning off of one or two strands, or the entire fence unless tracks indicate deer activity.*
10. *Drainage features, if and when re-built, will have 4:1 side slopes, preferably with hard edges, and will be piped where feasible.*
11. *No crops will be grown at the airport.*
12. *In conjunction with airport development, the ponds on airport property will be filled.*
13. *Any ponds necessary for stormwater management will be subject to engineered overwiring.*
14. *Future stormwater outflows must be beaver-proof.*
15. *Local farmers will be asked to consider night-time ploughing.*

16. *All garbage bins on site will be wildlife proofed.*
17. *Airport policy to ban feeding of wildlife by staff and visitors will be initiated and posted.*
18. *Breeding ledges for Rock Doves will be wire netted to reduce nesting opportunities.*
19. *Entry holes for starlings, Rock Doves and swallows will be identified and filled or covered.*
20. *Masting tree species (e.g., maple, oak and beech) will be opportunistically removed.*

Active

1. *Wildlife patrols will be maintained at irregular intervals throughout the times when the airport is open.*
2. *Sweeping of runway and taxiway areas will be undertaken in spring and fall following mass emergence of earthworms.*
3. *Gulls will be selectively shot at the airport to reinforce deterrents.*
4. *Geese will be shot in March and in fall as necessary to act as a deterrent.*
5. *Mallard may be shot in April to deter breeding.*
6. *Canada Goose, Mallard, Killdeer, Barn Swallow and Cliff Swallow nests will be searched for at appropriate times (each species twice per season minimum) and destroyed.*
7. *A spring baiting program will be initiated to kill nesting Rock Doves (if they occur).*
8. *Wildlife patrols will note any dead wildlife as strikes within 200 m of the runway.*
9. *Wildlife patrols will photograph any struck wildlife and if necessary bag some specimen material for identification by specialists.*
10. *Any animal carcasses on the airport or the adjacent road will be recorded, removed by wildlife patrols and disposed of in a manner that makes them unavailable to scavengers.*
11. *Wildlife patrols will inspect the ElectroBraid™ fence daily, especially at drainage features, and will ensure rapid repairs.*
12. *Wildlife patrols will undertake a beaver activity sweep weekly, April to November.*
13. *Beaver activity will result in immediate trapping. Lodges and dams will be completely removed.*
14. *Pyrotechnics and report shells (reinforced with live shooting where appropriate) will be used whenever high or moderate risk species are seen during wildlife patrols.*
15. *Wildlife patrols will be increased in April and August or when monitoring shows increased use of the airport by gulls.*
16. *Wildlife patrols will be undertaken prior to MEDIVAC flights, or when night time flights are due, provided advance notice is given and staff are available.*
17. *Active Coyote dens within the airport will be destroyed during the summer.*
18. *Common Snapping Turtles found airside will be removed to alternate wetland or creek locations.*

19. *Wild Turkey and White-tailed Deer hunting will be encouraged on the airport.*

Other

1. *A Daily Wildlife Management Log will be established using prepared field data sheets and computer software for data storage and analysis.*
2. *Monthly 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. *A hazard awareness program for Canada Geese (to include Rock Doves and ducks) will be developed using PowerPoint™ and presented to municipal staff, the adjacent golf course and local farmers.*
5. *A hazard awareness program for gulls (to include Turkey Vultures) will be developed using PowerPoint and shown to City staff and the landfill operator. The local landfill will be asked to address the gull issue.*
6. *A combined hazardous awareness program will be prepared for general audience use (e.g., local government).*
7. *The AWMP will be reviewed and updated prior to **[Enter date two years hence]**.*

Equipment, Contract Requirements and Permits

1. *An equipment list will be prepared for the AWMP.*
2. *A mowing device appropriate for cutting long grass in wet areas will be required.*
3. *A pest control specialist will be contracted for pigeon baiting (if nesting occurs).*
4. *A contract will be let for beaver trapping on a 48-hour response.*
5. *A Wildlife Management and Wildlife Strike software program will be purchased.*
6. *Federal firearm permits and federal kill permits for migratory birds will be updated to include the additional species (kill permits for gulls, geese, mallard, and nest destruction permits for Killdeer, Mallard, Canada Geese, Barn Swallows and Cliff Swallows).*
7. *Provincial/territorial hunting licences, trapping permits and kill permits will be updated.*

Communications Procedures

[Delete or amend any of these recommendations as applicable.]

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

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
	<ul style="list-style-type: none"> • Airport Manager • Wildlife Management Officer 		
	<ul style="list-style-type: none"> • Duty Manager • Back-up WMO 		

Roles and Responsibilities

[Amend this section according to circumstances prevalent at your airport. It may be that at smaller facilities, these responsibilities will be shared among fewer personnel.]

Senior airport staff 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.

Senior management, 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 nomination of the key Wildlife Management Officer, co-ordination of training, safety assurance and ensuring that the necessary equipment is available.

The Wildlife Management Officer will be responsible for:

- a) establishment and maintenance of the Wildlife Management Log (e.g., including strike data, details on wildlife numbers and activity; 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
	Airport Manager	<ul style="list-style-type: none"> • 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
	Assistant Manager	<ul style="list-style-type: none"> • Coordinating, supervising and the overall management of the AWMP. Nomination of the key Wildlife Management Officer (WMO) • Co-ordination of training, safety assurance • Ensuring that the necessary equipment is available
	Wildlife Management Officer (WMO)	<ul style="list-style-type: none"> • 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.
	Back-up to WMO	<ul style="list-style-type: none"> • Filling in for WMO during vacations, lunch, sick time etc.

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.

Current priorities for research at this airport are:

[Insert any priorities here, an example is provided below.]

1. Gull movements and behaviours associated with the landfill site and other gull attractants in the vicinity.

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APPENDIX 1-B – List of Transport Canada’s Port and Airport Sites

List of Transport Canada's main port sites

- Mont-Louis
- Portneuf
- Baie-Comeau
- Cap-aux-Meules
- St-François
- Gros-Cacouna
- Kégaska
- Pointe-au-Père
- Harrington Harbour
- Tête-à-la-Baleine
- La Tabatière
- Blanc-Sablon
- Gaspé
- Les Méchins
- Matane
- Rimouski
- Vieux-Fort
- Carleton
- Paspébiac
- Chandler

List of Transport Canada's main airport sites

- Chévery
- Havre St-Pierre
- Îles-de-la-Madeleine
- Lourdes-de-Blanc-Sablon
- Sept-Îles