Geotechnical Engineering

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Materials Testing

Building Science

Archaeological Services

patersongroup

Scoped Environmental Impact Statement

301 Lett Street
Ottawa, Ontario

Prepared For

Claridge Homes

September 4, 2019

Report: PE4725-1

Paterson Group Inc.

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EXECUTIVE SUMMARY

Assessment

Paterson Group was retained by Claridge Homes to prepare a Scoped Environmental Impact Statement (EIS) for a proposed development at 301 Lett Street, in the City of Ottawa, Ontario. The purpose of this Scoped EIS was to identify any sensitive species or habitats at the site or surrounding lands that may be affected by the proposed development, and to recommend appropriate mitigation measures.

The subject site is currently vacant and grass/weed covered. Historical research indicates that site has been vacant since approximately 1962, and surrounding land use has been mainly residential with some commercial purposes. The site visit did not identify any vegetation communities or species at risk as identified by the Ministry of Natural Resources and Forestry (MNRF). The subject site is considered to provide potential nesting habitat for several bird species at risk (eastern meadowlark, bobolink). The aqueduct to the south is considered to provide potential habitat for species at risk.

The proposed works will generate dust, noise, increased suspended sediment in runoff, and will require removal of existing vegetation. Noise and dust may affect wildlife in the vicinity of the subject site, and removal of existing vegetation will remove habitat for some wildlife. Increased sediment in runoff will reduce the quality of aquatic habitat, including habitat for species at risk, if it reaches the aqueduct to the south.

Recommendations

Due to the proximity of the works to the aqueduct, which is considered to be potential habitat for wildlife including American eel, a species at risk, aquatic habitats may be affected by the proposed works, and mitigation measures should be undertaken to prevent adverse effects.

In order to prevent excessive dust/runoff migration into the aqueduct during the development works, it is recommended that geotextile barriers be used along the site boundaries and staging areas, especially where steeper slopes are present or lands between the source and aqueduct are sparsely vegetated. It is also recommended that reptile and amphibian exclusion fencing be installed along the same boundary (may be the same fence, with appropriate specifications), to prevent wildlife from accessing the subject property during the proposed development activities.

To avoid potential negative impacts to nesting birds on the subject site, and any small mammals which may be living below the surface of the subject property, timing windows

/ sensitive times as specified by the City of Ottawa and Ministry of Natural Resources and Forestry should be respected. The site should be pre-stressed to drive out wildlife residents, and a groundhog/fox/rabbit trap should be placed near the burrow entrance.

If any species at risk are present on the site during the proposed development project, activities should be stopped and the MNRF should be contacted for further instruction and/or wildlife removal.

1.0 INTRODUCTION

At the request of Claridge Homes, Paterson Group (Paterson) has prepared a Scoped Environmental Impact Statement for a proposed residential development at 301 Lett Street, in the City of Ottawa, Ontario. The purpose of this Scoped EIS was to identify any wildlife and habitats that may be affected by the proposed works, and to recommend appropriate mitigation measures.

Paterson was engaged to conduct this Scoped EIS by Mr. Vincent Denomme of Claridge Homes. Claridge's offices are located at 210 Gladstone Avenue, Ottawa, Ontario. Mr. Denomme can be reached by telephone at 613-233-6030. This report has been prepared specifically and solely for the above noted project which is described herein. It contains all our recommendations for the proposed repair project.

The conclusions of this Scoped EIS are based on information gathered from a limited field inspection program and desktop research. The recommendations are based on a review of readily available information and observations made at the time of the field assessment. The research relies on information supplied by others, such as local, provincial and federal agencies, and was limited within the scope-of-work, time and budget of the project herein.

2.0 PROPERTY INFORMATION

Location:	The subject site is located at the southwest corner of Lett Street and Fleet Street, in the City of Ottawa.
Latitude and Longitude:	45° 24' 56" N, 76° 42' 46" W

Site Description:

Configuration:	Rectangular.
Site Area:	5,300 m^2 (approximate)
Zoning:	MD – Mixed Use Downtown Zone.
Current Use:	The subject site is vacant.

3.0 SCOPE OF INVESTIGATION

The scope of work for this Scoped Environmental Impact Statement was as follows:

- ❒ Investigate the existing conditions present at the subject site by conducting site reconnaissance;
- ❒ Conduct interviews with persons knowledgeable of the proposed project;
- ❒ Conduct research to investigate potential adverse impacts and appropriate mitigation measures;
- ❒ Provide mitigation and monitoring recommendations and further investigative work if required.

4.0 DESCRIPTION OF THE SITE AND NATURAL ENVIRONMENT

4.1 Historic Information

The property was occupied by residential dwellings from at least 1888 until approximately 1962, when the National Capital Commission expropriated the lands in the area. All vegetation was cleared from the property between 2002 and 2005 and has since been occasionally used as a construction staging area.

4.2 Environmental Source Information

Areas of Natural Significance

A search for areas of natural significance and features within the study area was conducted on the web site of the Ontario Ministry of Natural Resources and Forestry (MNRF) on August 23, 2019. The search did not reveal any natural features or areas of natural significance in the study area.

eBird Registry

The eBird website was consulted as a source of information on sightings of bird species in the area of the subject site. Bird survey data is uploaded to the site on a voluntary basis by recreational birders.

The site identified bald eagles (sighted in 2013, 500 m to the west), barn swallow (2013-2018 sightings,150-500 m to the west and northwest), chimney swift (2018 and 2019, 150-300 m to the northwest and northeast), common nighthawk (2019, 500 m to the southeast), and peregrine falcon (2016, 200 m northwest) in the vicinity of the subject property. These birds are species at risk in Ontario. However, based on observations made at the subject property, if these species are present on or use the subject site, they are not expected to be significantly or permanently affected by the proposed works.

Potential Species at Risk

Based on consultation with the MNRF as well as the NHIC mapping data, American eel is considered to be a potential inhabitant of the aqueduct located approximately 40 m to the southeast of the subject property.

Other (non-avian) species at risk which may be present in the area of the work site include lake sturgeon, several lichen species, skillet clubtail (a dragonfly), and horn-leaved riverweed. These species are not expected to be found on the subject site but may be affected by the proposed development works if they are located on adjacent lands / waterways. Refer to the Ottawa Species at Risk Handbook in the appendix to ensure these species are not disturbed during the proposed works.

4.3 Observations of the Natural Environment

The site visit was conducted August 23, 2019, to assess the general conditions at the site and identify dominant plant and wildlife species. Weather conditions were overcast, with a temperature of approximately 21 ° C.

Buildings and Structures

There were no buildings or structures on the subject site at the time of the site visit.

Site Features

The subject property consists of vacant land, surrounded by roadways, followed by vacant lands, an aqueduct, and residential condominiums. The land between the subject site and the aqueduct consists of vacant land with some stockpiled fill material and abandoned pedestrian pathways, most of which is covered with vegetation (staghorn sumac is a dominant species). This area acts as a buffer between the aqueduct and the subject property, and includes some abrupt elevation changes, providing some measure of protection from development activities. However, there is one area, to the southeast of the subject site, which has more direct access to the aqueduct, and includes a paved pathway.

Site drainage primarily consists of surficial infiltration, with some runoff to catch basins along Lett Street, Lloyd Street, and Fleet Street. No standing water or evidence of surficial staining were observed at the time of the site visit.

Potential Wildlife Habitat

Multiple fish species are known to be present in the Ottawa River (and potentially in the aqueduct, including American eel). Some reptile and amphibian species may also frequent the aquatic and terrestrial environments in the vicinity of the proposed works, particularly during the spring mating and nesting seasons.

The low, herbaceous vegetation on the subject property is considered to be suitable habitat for small burrowing mammals and ground-nesting birds, as well as

foraging habitat for a wide range of birds and small mammals. One burrow entrance was observed on the subject property.

Given the potential for fish, reptile and amphibian species in the area, measures should be taken during construction to prevent wildlife incursions from the aqueduct and surrounding lands (for reference, see Appendix 2 Technical Note on the use of exclusion fencing).

5.0 PROPOSED DEVELOPMENT

A multi-unit residential building is proposed for the subject site.

Site preparation activities will include vegetation clearing (low herbaceous plants including grasses, thistle, aster, milkweed, vetch, and wild carrot), fence installation, and materials stockpiling. The construction process will result in dust, noise, and debris generation. These activities will pose temporary disruptions to wildlife that currently occupy or use the adjacent lands, particularly the aqueduct to the south and its banks.

6.0 MITIGATION MEASURES

6.1 Environmental Compliance

Reference should be made to appropriate regulations and legislation pertaining to environmental protection, including the following:

- Environmental Protection Act
- Species at Risk Act
- Fisheries Act
- O.Reg. 213/91

All necessary licenses and approvals should be obtained before any development works begin, and all personnel on site should be made aware of the local environmental conditions and requirements of the proposed works.

6.2 Environmental Contingency Plans

Plans for the following contingencies should be prepared and made available:

- Fuel spills
- Erosion/runoff events

- Emergency response
- Wildlife interference (wildlife removal)

6.3 Recommended Mitigation Measures

Site Information

Ensure all personnel are informed of the environmental conditions, the requirements for environmental protection, and the rationale for each applied mitigation measure.

Sediment and Erosion Control - General

Silt geotextile fencing and/or other slope protection to prevent slope disruption resulting from frequent travel. The following considerations/measures should be taken prior to project commencement:

- ❒ Maintain a buffer (where possible) between the work site and watercourses (i.e. the aqueduct). The MECP recommends a 30 m buffer for streams with cool water fisheries, such as the aqueduct.
- ❒ Erosion control measures should be implemented prior to work and maintained throughout the project.
- ❒ Retain existing vegetation and stabilize exposed soils with vegetation where possible - erosion prevention is important in reducing sediment delivery to downstream aquatic habitat.
- ❒ Limit the size of disturbed areas by minimizing nonessential clearing and grading.
- ❒ Any deterioration/damage to erosion control measures should be repaired as soon as possible.
- ❒ Sufficient quantities of erosion control supplies (such as silt fence or geotextile fabric) should be maintained on site to address any issues.
- ❒ Erosion control measures should be inspected on a regular basis. Should a storm event be predicted, all installed erosion control measures should be reinforced as necessary.

Sediment and Erosion Control - Specific Measures

Geotextile materials should be used to prevent movement of particulate matter and prevent contamination of the adjacent aqueduct.

Surface runoff should be directed to vegetated areas. Surface runoff from staging areas or other work areas should not enter the aqueduct directly (runoff may be detrimental to aquatic wildlife and habitats).

Due to the vegetation separating much of the subject site from the aqueduct, combined with the elevation changes, this area is less vulnerable to influxes of sediment-laden runoff. Although geotextile barriers should be installed in this area (and appear to have been installed in the past), vegetation and variable slopes in this area will likely prevent most if not all runoff from directly entering the aqueduct. The southeast corner of the site is somewhat more exposed, and there is a potential for runoff to directly enter the aqueduct. There is a nearly continuous paved surface connecting the southeast corner of the subject site to the aqueduct via Lett Street and a pedestrian pathway.

Geotextile barriers should be installed along the property boundary at this location, and also closer to the aqueduct. If significant runoff is expected, or the geotextile barrier is deemed to be insufficient protection, secondary measures, such as redirecting runoff to adjacent vegetated areas, may be more suitable.

Filtration inserts should be placed in catch basins.

Catch basins on Fleet Street, Lett Street, and Lloyd Street will receive runoff from the subject property that will contain increased suspended solids during construction. To reduce the total suspended solids (TSS), catch basins should be sealed or have filtration inserts installed. When the insert becomes saturated, or dislodged from the catch basin, it should be removed and replaced. Depending on the characteristics / contents of runoff, volume of suspended solids, and duration of the development project, installation of oil-grit separators may be appropriate.

Wetting of loose material will reduce airborne dust creation.

Water should be stored on site to wet down exposed soils, fill materials, or road surfaces, particularly during windy and/or dry weather when dust and particles are more likely to become airborne. Airborne particulate matter is detrimental to human and wildlife health and can also affect aquatic habitat when it settles on water surfaces.

Do not clean work equipment in water bodies, including the aqueduct.

Work equipment may contain native soil material and hydrocarbon and VOC contaminates from fuels or lubricants, and this material should not be introduced to the natural environment where possible. Equipment should be cleaned, and dirty water should be properly disposed.

Reptile and Amphibian Exclusion Fencing

Fencing should be used to prevent the incursion of wildlife into the work area. This fencing may be paired with erosion control fencing, but it should be noted that there are separate specifications for wildlife fencing (refer to the note on Reptile and Amphibian Exclusion Fencing in the Appendix). Fencing should be installed prior to any construction commencement. If any reptiles or amphibians are encountered within the work area, they are to be removed to a safe distance.

Small Mammal Habitat

One burrow was observed on the subject property at the time of the site visit. The site is considered to be likely habitat for small mammals, and the timing of pre-construction and construction works should be planned to prevent significant disturbance. April through mid-August (breeding season for most species), and mid-October through March (for overwintering woodchucks, if present) are considered to be the sensitive times for small mammal habitat. To reduce the likelihood that small mammals are present on the site, mow the site outside of the breeding season, then maintain the site as mowed grass until onsite work begins. Please refer to the City of Ottawa Protocol for Wildlife Protection During Construction, included in the Appendix of this report.

Nesting and Foraging Birds and Insects

If any nests are encountered in the work area, they should be avoided, or removed by a licenced professional. Vegetation should be cleared between August 28 and April 1 to avoid disturbance of nesting birds. The nest occupants may be protected under the Species at Risk Act or Migratory Birds Convention Act, and some bird species are known to nest on ground with low vegetation (meadow, field, etc.).

To prevent permanent loss of foraging and nesting habitat, landscaping can be used to revegetate areas around the proposed building with plants suitable for native species.

Delineate Work Area

Minimise and delineate the staging areas and access locations by installing fencing, placing stakes and signs, and/or painting lines, where appropriate.

7.0 REVIEW AND EVALUATION OF INFORMATION

7.1 Natural Heritage Features/Functions

No natural heritage features were identified on the subject site. The aqueduct located to the south of the site is connected to the Ottawa River and is considered to pose a natural heritage function. Wildlife and habitat in and adjacent to the waterway must be maintained, and disturbances minimised.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Scoped EIS is considered to be sufficient to conclude that the natural environment is not expected to be permanently negatively affected by the proposed construction works, provided appropriate mitigation measures are undertaken.

8.0 CONCLUSIONS

Assessment

Paterson Group was retained by Claridge Homes to prepare a Scoped Environmental Impact Statement (EIS) for a proposed development at 301 Lett Street, in the City of Ottawa, Ontario. The purpose of this Scoped EIS was to identify any sensitive species or habitats at the site or surrounding lands that may be affected by the proposed development, and to recommend appropriate mitigation measures.

The subject site is currently vacant and grass/weed covered. Historical research indicates that the site has been vacant since approximately 1962, and surrounding land use has been mainly residential with some commercial purposes. The site visit did not identify any vegetation communities or species at risk as identified by the Ministry of Natural Resources and Forestry (MNRF). The subject site is considered to provide potential nesting habitat for several bird species at risk (eastern meadowlark, bobolink). The aqueduct to the south is considered to provide potential habitat for species at risk.

The proposed works will generate dust, noise, increased suspended sediment in runoff, and will require removal of existing vegetation. Noise and dust may affect wildlife in the vicinity of the subject site, and removal of existing vegetation will remove habitat for some wildlife. Increased sediment in runoff will reduce the quality of aquatic habitat, including habitat for species at risk, if it reaches the aqueduct to the south.

Recommendations

Due to the proximity of the works to the aqueduct, which is considered to be potential habitat for wildlife including American eel, a species at risk, aquatic habitats may be affected by the proposed works, and mitigation measures should be undertaken to prevent adverse effects.

In order to prevent excessive dust/runoff migration into the aqueduct during the development works, it is recommended that geotextile barriers be used along the site boundaries and staging areas, especially where steeper slopes are present or lands between the source and aqueduct are sparsely vegetated. It is also recommended that reptile and amphibian exclusion fencing be installed along the same boundary (may be the same fence, with appropriate specifications), to prevent wildlife from accessing the subject property during the proposed development activities.

To avoid potential negative impacts to nesting birds on the subject site, and any small mammals which may be living below the surface of the subject property, timing windows / sensitive times as specified by the City of Ottawa and Ministry of Natural Resources and Forestry should be respected. The site should be pre-stressed to drive out wildlife residents, and a groundhog/fox/rabbit trap should be placed near the burrow entrance.

If any species at risk are present on the site during the proposed development project, activities should be stopped and the MNRF should be contacted for further instruction and/or wildlife removal.

9.0 STATEMENT OF LIMITATIONS

This Scoped Environmental Impact Statement report has been prepared in general accordance with the Environmental Assessment Act. The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The recommendations of the Scoped EIS are based on a review of readily available ecological and regulatory information and a cursory review made at the time of the field assessment. The research relies on information supplied by others, such as, local, provincial and federal agencies and was limited within the scope-of-work, time and budget of the project herein.

This report was prepared for the sole use of Claridge Homes. Permission and notification from Claridge and Paterson will be required to release this report to any other party.

Paterson Group Inc.

Anna Graham, M.E.S.

Report Distribution:

- Claridge Homes
- Paterson Group Inc.

10.0 REFERENCES

Federal Resources
Natural Resources Canada – The Atlas of Canada.
Fisheries and Oceans Canada, Measures to avoid causing harm to fish and fish habitat.

Provincial Resources
MNRF Areas of Natural Significance.
MECP/MNRF B-6 Guidelines for Evaluating Construction Activities Impacting on Water Resources.

Municipal Resources
The City of Ottawa geoOttawa website.

Local Information Sources
Ministry of Natural Resources and Forestry information guide.
Personal Interviews.

Public Information Sources
Google Earth.
Google Maps/Street View.
eBird online birding registry.

FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE4725-1 – SITE PLAN

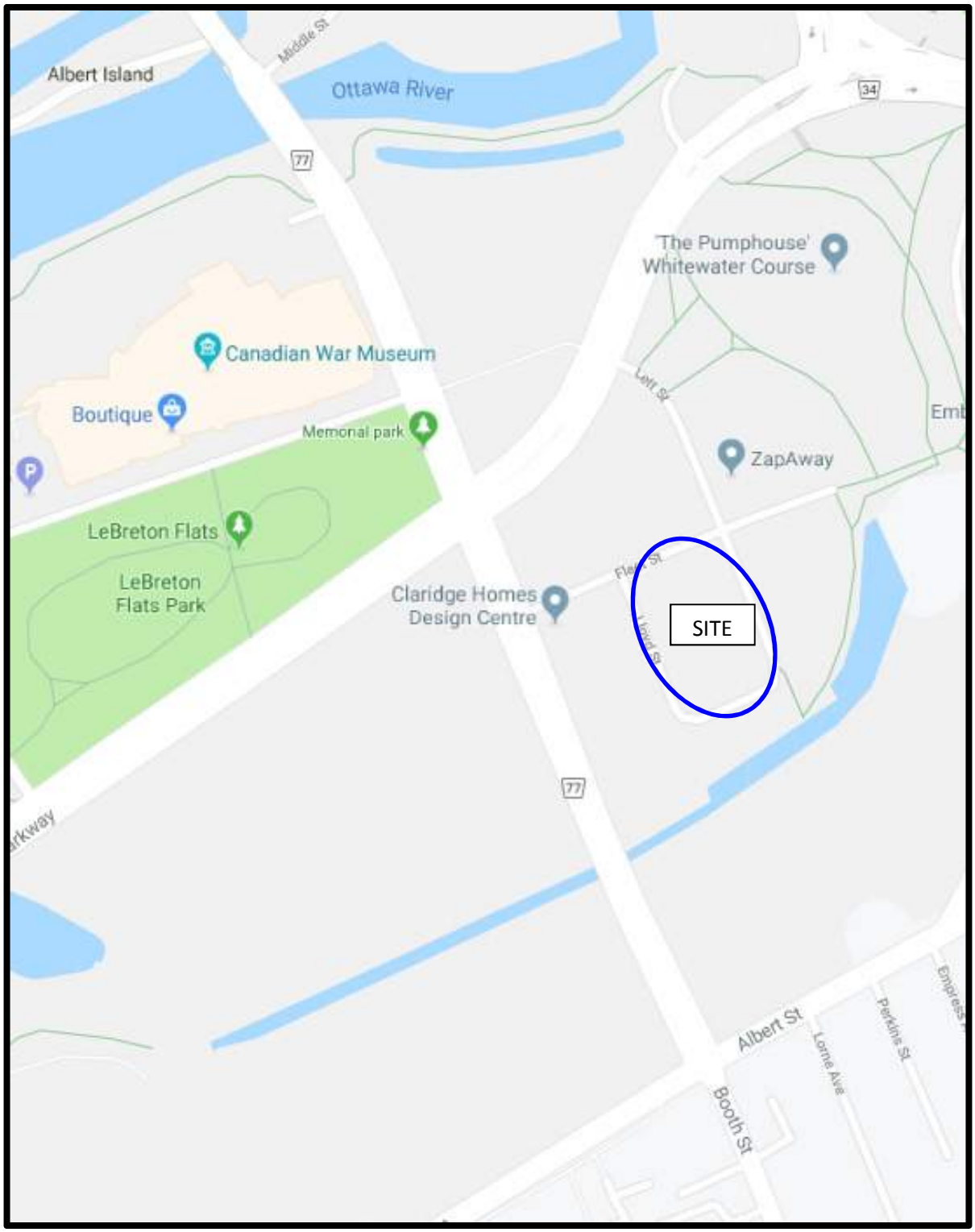
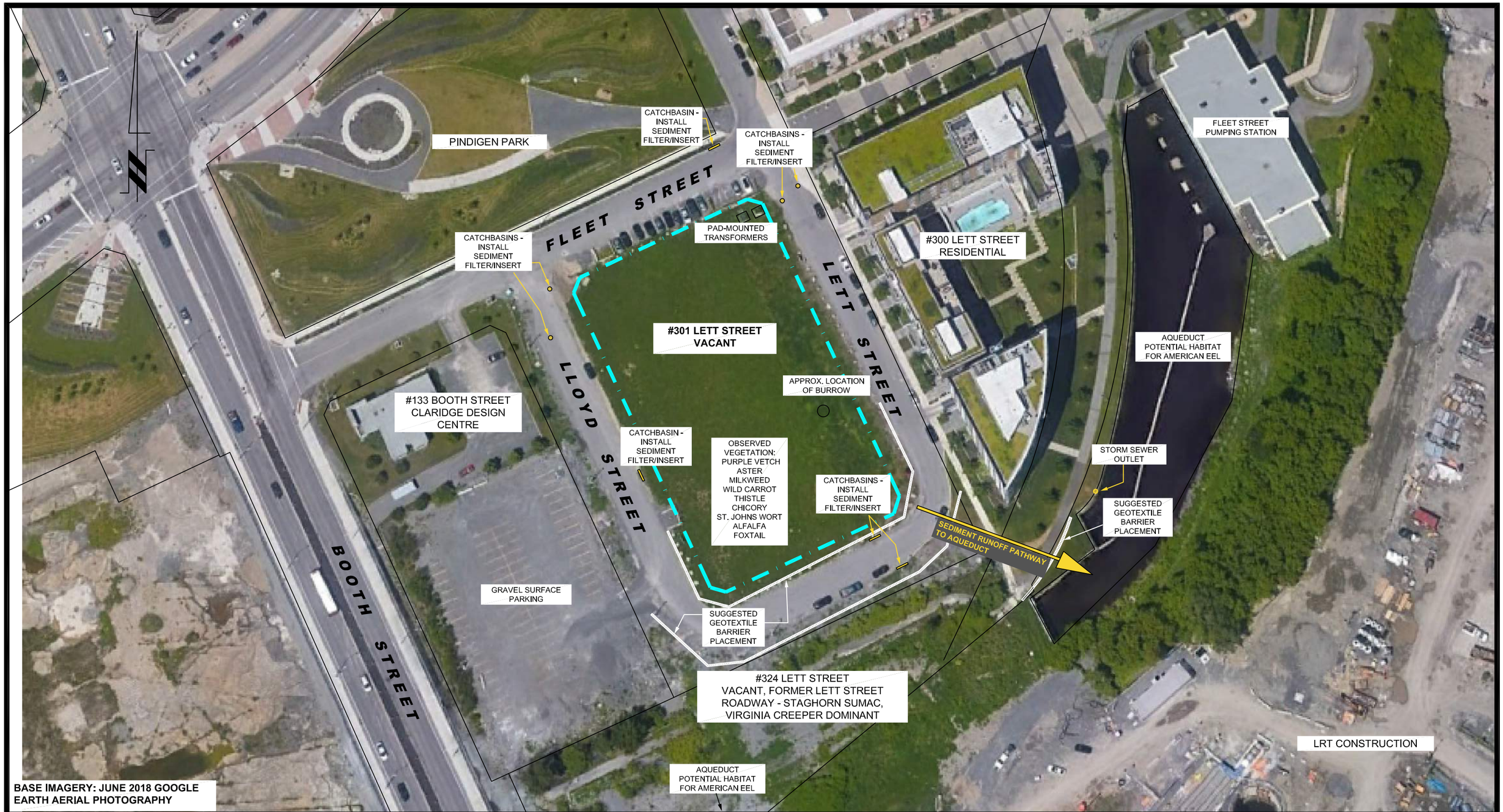


FIGURE 1

KEY PLAN



BASE IMAGERY: JUNE 2018 GOOGLE EARTH AERIAL PHOTOGRAPHY

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NO.	REVISIONS	DATE	INITIAL

CLARIDGE HOMES

SCOPED ENVIRONMENTAL IMPACT STATEMENT
301 LETT STREET

OTTAWA, ONTARIO

Title:

SITE PLAN

Scale: 1:1000	Date: 08/2019
Drawn by: AG	Report No.: PE4725-1
Checked by: MD	Drawing No.: PE4725-1
Approved by: MSD	

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APPENDIX 1

SCOPED EIS FORM

APPENDIX 1: SCOPED ENVIRONMENTAL IMPACT STATEMENT (EIS) FORM

This form is intended for use by applicants (primarily private landowners) who need to conduct a Scoped EIS in support of minor development applications such as single lot severances or minor changes in land use. Instructions on the types of information needed are included in the form, with additional information provided following the form. The form also includes references to specific sections of the City of Ottawa's Environmental Impact Statement (EIS) Guidelines for more detailed information on EIS requirements.

You may not need to complete every section of this form. City of Ottawa staff (the Environmental Planner, Development Review) can advise you which sections need to be completed for your specific project.

If you do not know the answer to a question, please enter "unknown." City staff may be able to assist you in answering the question during their review of the development application and EIS.

Completion of this form does not constitute or guarantee any type of planning approval.

When is an EIS Required? **(EIS Guidelines, Section 1.2)**

You have been asked to provide an EIS because you are proposing a development or site alteration project in or adjacent to environmentally designated lands or other significant parts of the City's natural heritage system (NHS). The EIS Decision Tool (Appendix 2 of the EIS Guidelines) provides a checklist of these EIS `triggers.' Note that the distances that trigger an EIS may be different for urban and rural areas. These distances are normally measured from your property boundary to the edge of the designated lands or natural feature.

In accordance with the Provincial Policy Statement and the Official Plan, the basic principle of the EIS Guidelines is that:

> At minimum, the EIS must demonstrate that the proposed development or site alteration will have no negative impacts on the values or ecological functions for which the triggering environmentally significant lands or natural heritage features have been identified.

In many cases, you can avoid or greatly reduce the risk of negative impacts by locating your project (whether it is a new building or a new lot) away from the significant natural features identified. In other cases, you may need to schedule parts of the work to occur outside of sensitive times of the year for wildlife.

REQUIREMENT FOR PRE-CONSULTATION
(EIS Guidelines, Sections 1.3, 2.1 and 2.2)

Before completing this form, you must discuss your proposed project with the Development Review planners of the City of Ottawa. They will determine if an EIS is required, and if so, whether you need to submit this form or a Detailed EIS report.

Please provide the name(s) of the City staff you have discussed this EIS with, and the date(s) of the discussion:

Andrew McCreight

1. Property Identification
(EIS Guidelines, Section 3.1)

1.1 Property Owner's Name:
Claridge Homes

1.2 Municipal Address of Property:
301 Lett Street, Ottawa, Ontario

1.3 Lot, Concession and Township (rural properties only):
Not applicable

1.4 Property Information Number(s): (available at http://ottawa.ca/en/city_hall/emaps/index.html)
04112-0160

1.5 Mailing Address (if different from property address):
2001-210 Gladstone Avenue, Ottawa, Ontario, K2P 0Y6

1.6 Land Use Designation[s] and Zoning from the Official Plan (http://www.ottawa.ca/en/city_hall/planningprojectsreports/ottawa2020/official_plan/index.html) and Zoning By-Law (http://www.ottawa.ca/en/licence_permit/bylaw/a_z/zoning/index.html):
Land Use Designation: Central Area (adjacent to Major Open Space)
Zoning: MD - Mixed Use Downtown Zone

1.7 Existing and past land uses:
Currently, the property is vacant and unused. In the past, the property was used for residential purposes, until all buildings were demolished in the 1960s.

Adjacent properties to the east were recently developed with residential structures. Lands to the south are vacant (or occupied by an aqueduct). Land to the north has recently been developed into a park space. Lands to the west are vacant, with the exception of one building (Claridge Design Centre).

REQUIREMENT FOR SITE VISIT
(EIS Guidelines, Sections 2.2 and 3.2)

If you currently live on the property, please indicate how long you have lived there:

You must have visited the site at least once during the growing season for the purpose of evaluating the proposed project impact on the natural environment. Please fill in the following table with the required site visit information.

Date	Time	Personnel Involved	Weather Conditions	Purpose of Visit
August 23, 2019	12pm	Anna Graham Biologist, Paterson Group	Overcast	Wildlife and vegetation observation

2. Description of the Site and the Natural Environment
(EIS Guidelines, Sections 1.5, 2.1, 2.2 and 3.2)

2.1 General Map of the Natural Environment
(EIS Guidelines, Section 3.2.1)

Please attach a map showing your property in relation to the surrounding environment, including the natural features on and/or adjacent to the site (note: your property line must be clearly indicated). Recent aerial images can be obtained through the City's interactive mapping tool at http://ottawa.ca/en/city_hall/emaps/index.html

Photographs of the property also help to illustrate the existing conditions on the site.

Please describe the significant natural feature(s) on or adjacent to your property and indicate the feature's location(s) relative to your project.

There are no significant natural features on the subject property.

An aqueduct is located to the south of the subject property, and is considered to be potential habitat for species at risk, namely, American eel. The aqueduct is covered (a tunnel) immediately to the south of the site, but is exposed water to the southeast and southwest (41 m and 65 m, respectively).

2.2 Landforms, Soils and Geology
(EIS Guidelines, Section 3.2.2)

Please describe the physical environment: the landform (e.g., sloped, flat, valley, hill, etc.) soils (e.g., silty, sandy, clay, peat, etc.) and depth to bedrock and type (e.g., limestone, shale, granite, etc.). Identify the source(s) of information used (e.g., personal knowledge, well record, available mapping). Attach copies of mapping and other supporting documentation when available.

According to aerial photographs, the subject property has been cleared of vegetation multiple times since the buildings were demolished in the 1960s. The ground surface is relatively flat, and consists of fill (negligible native overburden) overlying limestone and shale of the Verulam formation (according to Urban Geology of the National Capital Area mapping).

2.3 Surface Water, Groundwater and Fish Habitat
(EIS Guidelines, Section 3.2.3)

Please describe the surface water features (e.g., creeks, drains, ponds, etc.) including their approximate widths and depths, duration of flow (i.e., is water present all year round or not) and location relative to your project. Are there any places where ponds occur during springtime or after storms? Describe drainage and groundwater conditions, including depth to groundwater where known.

There are no surface water features on the subject property.

The aqueduct 40 m to the south of the property is present year-round. Water flows from southwest to northeast, and is considered to be potential American eel habitat (a species at risk - designated endangered).

Do any of the surface water features contain minnows or other fish? Please list the kinds of fish present (if known).

The aqueduct to the south of the subject property is potential habitat for minnows or other fish, including American eel.

2.4 Vegetation Cover
(EIS Guidelines, Section 3.2.4)

Describe each of the types of vegetation community shown on the natural environment map (e.g., lawn, cropped field, old field, marsh, thicket/scrub, swamp, woods, etc.). List the most common plants observed in each of these communities, if possible.

As an abandoned urban lot with surficial fill coverage, the only kind of vegetation community present on the site is similar to what would be found in grassland. The most common plants observed at the time of the site visit were alfalfa, purple vetch, St. John's wort, wild carrot (Queen Anne's lace), aster, field bindweed, foxtail, chicory, and common thistle.

2.5 Wildlife
(EIS Guidelines, Section 3.2.5)

List all wildlife species known or suspected to occur in the vicinity of the property. Where possible, specify whether the animal lives on the property or whether it is a visitor (e.g., looking for food or migrating through). Indicate why each species has been included on this list (e.g., seen, tracks found, call heard, reported previously).

Species Name	Resident/Visitor	Evidence
Groundhog Rabbit Red fox	Possible resident Possible resident Possible resident	Burrow on eastern side of the property
Bumblebee	Visitor, possible resident	Observed on thistle flowers

2.6 Habitat for Species At Risk
(EIS Guidelines, Section 3.2.6)

List any species at risk known or suspected to occur in the vicinity of the property. Indicate why each species has been included on this list (e.g., seen, tracks found, call heard, reported previously). Provide photographs if available.

American eel is suspected to occur in the aqueduct located 40 m to the southeast of the subject property. This species has been included based on the recommendation of the Ministry of Natural Resources and Forestry.

Other species at risk that may occur on the site include foraging/hunting birds (peregrine falcon, common nighthawk), nesting birds (bobolink, eastern meadowlark), mammals (little brown bat).

3. DESCRIPTION OF THE PROPOSED PROJECT
(EIS Guidelines, Section 3.3)

Please attach any available drawings or plans of your proposed project, to illustrate the information provided below.

3.1 What is the purpose of the development or site alteration? *(e.g., creation of a new lot for a single detached home, expansion of an existing home, etc.)*

Development of a residential structure on a vacant lot.

3.2 What site preparation, if any, will be required? *(e.g., brush-clearing, tree removal, blasting, grading, filling, etc.)*

Low herbaceous vegetation will be cleared. At least one animal burrow on the site will be destroyed.

3.3 What construction or demolition activities, if any, will be required? *(e.g., excavation, preparation of foundation/pad, installation of public or private utilities, construction/demolition of a building, landscaping, etc.)*

Excavation, utilities installation, building construction, and landscaping are anticipated to occur as part of the proposed development.

3.4 What ongoing activities, if any, will occur at the site? *(e.g., private residence, operation of a small business, farming, etc.)*

Residential.

3.5 Have you consulted with other regulatory agencies (e.g., Conservation Authority, Ministry of Natural Resources, Ministry of Environment) to determine whether your project will require their authorisation?

Email sent to Rideau Valley Conservation Authority. No response has been yet received.

4. IMPACTS AND MITIGATION
(EIS Guidelines, Sections 3.4 and 3.5)

4.1 Based on the information provided above, complete the attached summary table to identify the potential impacts of the various project activities on the natural environment on or adjacent to your property, and the mitigation measures that will be used to avoid or reduce these impacts.

4.2 Will the project result in any positive effects on the natural environment? Please include positive effects in the summary table, and provide a brief description below.

The project has the potential to result in positive effects on the natural environment, if due consideration is given to landscaping and providing space for potential wildlife habitat (native species planting, bird box placement, etc)

5. CONCLUSION
(EIS Guidelines, Section 3.7)

Will the proposed project result in any negative impacts to natural features or ecological functions, once the recommended mitigation measures have been implemented? *NOTE: residual negative impacts to significant natural features or ecological functions may mean that the project cannot be approved as proposed.*

No residual negative impacts to natural features or functions are anticipated. Temporary negative impacts will include dust and noise generation that may disturb local wildlife and loss of habitat. Loss of habitat may be mitigated by providing or preserving suitable habitat on adjacent lands (vacant land to the south), and by replacing vegetation on the subject site after development with suitable native species (for example, flowering plants favoured by bees, monarch butterflies, etc.).

6. DECLARATION
(EIS Guidelines, Section 3.7)

Please provide the names and affiliations of all individuals who contributed to the preparation of this EIS, and indicate their role(s) in the process (e.g., EIS author, biologist, planning consultant, geotechnical engineer). Attach resumés where needed to demonstrate professional qualifications

Anna Graham, B.Sc., M.E.S. - biologist and EIS author

I hereby certify that the information contained within this EIS is accurate and complete, to the best of my knowledge. I acknowledge that incomplete or incorrect information may delay the development review process.

Signature of Owner/Applicant — Date

Anna Graham — Sept. 5 2019

Signature of EIS Author (if different from above) — Date

NOTE: Completion of this EIS form does not constitute or guarantee any type of planning approval

EIS Form, Section 4.1: Impacts and Mitigation Summary Table

Activity	Natural Heritage Feature/Function	Potential Effect (may be positive or negative)	Proposed Mitigation	Residual Effect (may be positive or negative)
Site Preparation				
Vegetation clearing	Wildlife habitat (forage)	Loss of habitat	Revegetate	New habitat may be more suitable
Grading/excavation	Wildlife habitat (burrow)		Avoid active mammal times	Loss of burrow habitat. Land to
	Wildlife habitat (aqueduct)	Sediment in runoff	Install sediment barriers	south may replace lost habitat
				None (sediment barriers)
Construction				
Construction of new buildings	None	Dust, noise, dust, vibration may	Respect noise and vibration limits,	None
Landscaping	Wildlife habitat	disturb wildlife in area	reduce airborne dust generation	Potential positive effect of
		Potential for new, superior habitat	by watering surface, using geotex.	improved habitat for some species
		by planting appropriate vegetation	barriers	
Operation				
Residential	Wildlife habitat	Increased human activity/presence	Provide vegetation habitat away	None
		in area	from high traffic areas	
Other				
Examples				
Site Preparation: Vegetation clearing to allow for house construction	*Natural vegetation (note: no significant species or significant woodlands known to occur on site)*	*Loss of natural vegetation from site*	*Only clear the area that is required to allow for development (house, well, septic, laneway)*	*Loss of X ha of natural vegetation within development footprint*
OR				
Other: Severance of 2 ha vacant lot for sale	*Significant woodland on property*	*If new lot developed in woods, could lose up to 2 ha of woodland*	*New lot will be located outside of woodland*	*None*

APPENDIX 2

SITE PHOTOGRAPHS

MNRF INFORMATION REQUEST GUIDE

REPTILE AND AMPHIBIAN EXCLUSION FENCING TECHNICAL NOTE

FUGITIVE DUST TECHNICAL BULLETIN

OTTAWA SPECIES AT RISK HANDBOOK

PROTOCOL FOR THE PROTECTION OF WILDLIFE DURING CONSTRUCTION

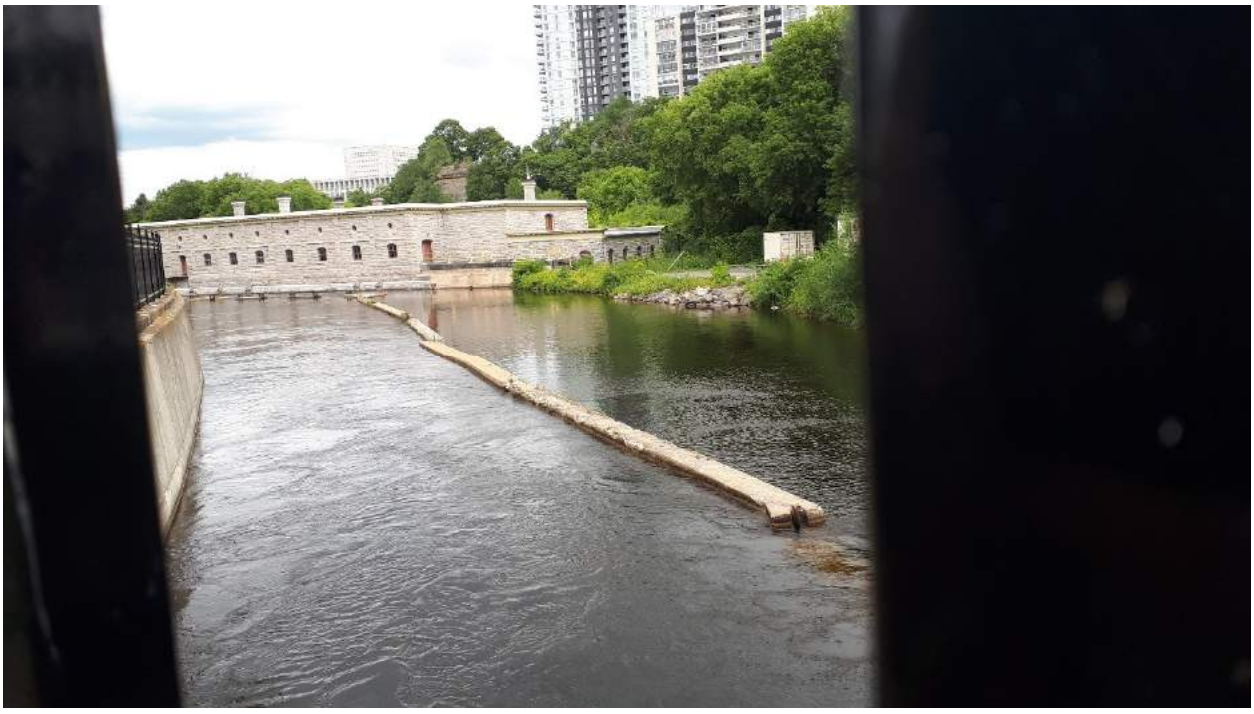
Site Photographs

PE4725 | 301 Lett Street, Ottawa, Ontario | August 23, 2019

Photograph 1: View of the subject property, looking northwest from the southeast side of the site. The Canadian War Museum is visible in the distance at centre.

Photograph 2: View of the subject site looking north from the corner of Lett Street and Lloyd Street.

Photograph 3: View of the space between the subject site and the aqueduct, looking southeast, from the southeast corner of the subject site.



Photograph 4: View of the aqueduct to the southeast of the subject site, looking northeast.

Photograph 5: Typical vegetation at the subject site: aster, vetch, St. John's wort.

Photograph 6: Typical vegetation at the subject site: alfalfa.

Photograph 7: View of the vacant space between the subject site and the aqueduct, looking west.

Photograph 8: View of the vacant space between the subject site and the aqueduct, looking south from the southern part of Lett Street. The ground surface drops down from the road level, rises, and drops again towards the location of the aqueduct (which is a tunnel directly south of the subject site).

Photograph 9: Small mammal burrow on the eastern side of the subject site.

Ministry of Natural Resources and Forestry

Ontario

Natural Heritage Information Request Guide

Regional Operations Division
Ministry of Natural Resources & Forestry

December 2018

Table of Contents

1.0 Background, Purpose and Scope

1.1 Background

The Ministry of Natural Resources and Forestry (MNRF) maintains a substantial amount of natural heritage information. The Government of Ontario is committed to transparency, customer service, and making information more publicly accessible. Access to natural heritage information is critical to informing municipal planning processes, development activities, and other initiatives such as science and research. To make natural heritage information more accessible and better understood, this document consolidates available MNRF natural heritage information and outlines how this information can be accessed.

1.2 Purpose of this Guide

The purpose of this guide is three-fold:

1. To provide a directory of natural heritage information sources available from the MNRF;
2. To reduce wait times for users to access the data, especially considering that much of the information is open and accessible; and
3. To help users efficiently access available data.

It remains the proponent's responsibility to:

- Complete a preliminary screening for their projects,
- Obtain available information from multiple sources,
- Conduct any necessary field studies, and
- Consider any potential environmental impacts that may result from a proposed activity.

To provide the most efficient service possible, proponents should complete natural heritage screenings **prior** to contacting Government of Ontario Ministry offices or other agencies for more detailed technical information and advice. This guide provides detailed information on where and how to access information to screen a study area in advance of consulting with Ministries.

1.3 Scope

MNRF maintains and provides information related to its resource management and land use planning mandate, including natural heritage, fisheries, wildlife, mineral aggregate resources, crown lands, protected lands and more. This information is made available to organizations, private individuals, consultants, and developers through online sources and is often considered under various pieces of legislation or as part of regulatory approvals and planning processes. This guide has been created to help users navigate the available natural heritage information to support various activities. This guide additionally provides a list of other sources of information beyond MNRF, although it is

not intended to be an exhaustive list of available sources.

This guide does not replace the Natural Heritage Reference Manual but is intended to support it. This guide is not intended to circumvent any field studies that may be necessary to document features and assess impacts.

This guide is a resource for proponents during project planning. Reviewing the layers listed in the appendices will enable proponents to prepare for both proponent and government led Environmental Assessments. For projects proposed on crown land, MNRF is the permitting agency and there may be additional initial screening requirements. Further studies may be required depending on the nature and location of the project.

1.4 Audience

The intent of this public guide is to make it easier for the proponents and consultants to access relevant information. This guide will also help internal Ministry staff who are responding to information requests or site screenings.

1.5 Disclaimer

The information available from MNRF and the sources listed below in the appendices should **not be considered as a substitute for site visits and appropriate field surveys.** Generally, information available from MNRF can be regarded as a starting point from which to conduct further field studies, if needed. While this data represents MNRF's best available current information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. There are many areas where MNRF does not currently have information. On-site assessments can better verify site conditions, identify natural features and values and confirm presence of species at risk and/or their habitats.

This guide will be updated from time to time. For a current version of this guide, please contact your local or regional Government of Ontario Ministry office. Up-to-date contact information for Ministry offices can be obtained through the Government of Ontario Employee and Organization Directory, Info-GO, available at http://www.infogo.gov.on.ca/infogo/home.html.

2.0 Data Resources

2.1 Make a Map: Natural Heritage Areas

The MNRF maintains the Make a Natural Heritage Area Map: http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US which provides public access to natural heritage information without the user needing to have Geographic Information

System (GIS) capability. It allows users to view and identify natural heritage features, mark areas of interest, and create and print a custom map directly from the web application. The tool also shows topographic information such as roads, rivers, contours and municipal boundaries.

Make a Natural Heritage Area Map should be consulted as a first step in screening for natural heritage features. This tool does not provide access to all of the MNRF's natural heritage information and some layers may be incomplete.

Users are advised that sensitive information has been removed from the natural areas dataset and the occurrences of species at risk, rare plant communities and wildlife concentration areas has been generalized to a 1-kilometre grid.

The web-based mapping tool displays natural heritage data, including:

- Generalized Species at risk occurrence data (based on a 1-km square grid),
- provincial parks,
- conservation reserves,
- Areas of Natural and Scientific Interest,
- Wetlands,
- Woodlands, and
- Natural Heritage Information Centre data.

Data cannot be downloaded directly from this web map, however, information included in this application is available digitally through Land Information Ontario: https://www.ontario.ca/page/land-information-ontario (LIO).

2.2 Land Information Ontario (LIO)

Most natural heritage data is publicly available. This data is managed in a large corporate database called the LIO Warehouse and can be discovered through the LIO Metadata Management Tool: https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home. This tool provides descriptive information about the characteristics, quality and context of the data. Publicly available geospatial data can be downloaded directly from this site.

The LIO Metadata Management Tool helps users to find, assess and access GIS data and houses up to 350 data and information products. Geospatial data are available through this tool, including (but not limited to):

- **Aquatic Resource Area (ARA) data classes:** general fisheries spatial data including water body type, thermal regime and fish species
- **Spawning Area (fish)**
- **Nursery Area (fish)**
- **Nesting Site (birds)**

- **Areas of Natural and Scientific Interest (ANSIs)**
- **Wetlands**
- **Wintering Area (deer, moose, etc.)**
- **Fire (Potential Hazardous Forest Types for Wildland Fire**

Appendix A links MNRF's authoritative, relevant data sets to the location in the LIO Database where the data can be downloaded.

Note that while most data is publicly available, some data may be considered highly sensitive (i.e., Nursery Areas for fish, species at risk observations), and as such, restrictions are in place limiting access to this information.

2.3 List of Species at Risk

In addition to the appendices in this document, the Ministry will provide a list of species at risk that should be considered when assessing potential negative impacts from a proposed development on features and their ecological functions.

2.4 Public Agencies

Ministries, Municipalities and Conservation Authorities may have proposed infrastructure work that requires screening. In these instances, these broader public sector organizations should contact the appropriate Ministry Office to explore more efficient ways to access information and make decisions. This could include entering into data sharing agreements. Please note that many public agencies already have ongoing data sharing agreements in place with LIO and the Natural Heritage Information Centre (NHIC).

2.5 For Additional Information

For information pertaining to corporate data, contact LIO for support by email at lio@ontario.ca or by telephone at 705-755-1878.

For further information pertaining to the NHIC, including data sharing agreements, please email NHICrequests@ontario.ca or call 705-755-2159.

There may be circumstances where a local Government of Ontario office should be consulted for additional information and/or technical advice. For instance, projects proposed on Crown Land should be discussed early in the project planning process with local MNRF District staff. A listing of District offices can be found on this web page https://www.ontario.ca/page/ministry-natural-resources-and-forestry-regional-and-district-offices

Appendix A: Natural Heritage Mapping Resources

The table below provides users links to maps and GIS data depicting natural heritage. This list is intended to help guide a natural heritage screening exercise. Click in the *Information Source* column for hyperlinks.

Information Source	Theme	Instructions for using this information
Wetland	Significant Wetlands	Use field" WETLAND_SIGNIFICANCE = Evaluated-Provincial" for provincially significant wetlands.
	Coastal Weltands	Use field"COASTAL_IND=Yes" for Coastal Wetlands
	Fish & Wildlife, Wetlands	Support evaluation and identification of habitat and wetlands. Please consult user guide for details. Consult the User Guide for more information.
Make a Natural Heritage Areas Map	Endangered and Threatened Species	Turn on the NHIC 1 km Grid square and use the Find… tool to query for species intersecting the grid. Consult the User guide for more information.
	Fish & Wildlife Habitat	Turn on the NHIC 1 km Grid square and use the Find… tool to query for species intersecting the grid. Consult the User guide for more information.
Provincially Tracked Species 1KM Grid	Endangered and Threatened Species	Use field "SARO_STAUS= 'Endangered' or SARO_STATUS='Threatened'" for Endangered and Threatened species.
Wintering Area	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Aquatic Feeding Area	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Breeding Area	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Calving Fawning Site	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.

Information Source	Theme	Instructions for using this information
Den Site	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Feeding Area, Wildlife	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Habitat Planning Range	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Mineral Lick	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Nesting Site	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Nursery Area, Wildlife	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Resting Area	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Staging Area, Wildlife	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
Travel Corridor, Wildlife	Wildlife Habitat	Supports evaluation and identification of wildlife habitat.
ANSI	Significant Areas of Natural and Scientific Interest	Use the field "ANSI_SIGNIFICANCE = Provincial" if you need to view only Provincially Significant ANSI. Consult the User Guide for more information.
Wooded Area	Woodlands	Supports evaluation and identification of significant woodlands and wildlife habitat
ARA Line Segment	Fish Species and Habitat	Supports evaluation and identification of fish habitat by indicating fish species present in the water feature. Consult the User Guide for more information.

Information Source	Theme	Instructions for using this information
ARA Polygon Segment	Fish Species and Habitat	Supports evaluation and identification of fish habitat by indicating fish species present in the water feature. Consult the User Guide for more information.
	At Capacity Lake Trout Lakes	Use field" AT_DEVELOPMENT_CAPACITY_IND = Yes" for designated at capacity lakes
Aquatic Resource Area (ARA) Survey Point	Fish Species	Supports evaluation and identification of fish habitat by indicating fish species present at that location. Consult the User Guide for more information.
Spawning Area	Fish Habitat	Supports evaluation and identification of fish habitat
Nursery Area, Fish	Fish Habitat	Supports evaluation and identification of fish habitat
Staging Area, Fish	Fish Habitat	Supports evaluation and identification of fish habitat
Feeding Area, Fish	Fish Habitat	Supports evaluation and identification of fish habitat
Travel Corridor Fish	Fish Habitat	Supports evaluation and identification of fish habitat
Ecoregion	Ecoregions	Used to determine what ecoregion covers your area
Natural heritage System Area	Natural Heritage System	Identifies Natural Heritage System Areas within the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, the Niagara Escarpment Plan and the Growth Plan for the Greater Golden Horseshoe. Consult this guide for more information.
Breeding Bird Atlas	Wildlife Habitat	Provides additional information on the location of Breeding Birds
eBird	Wildlife Habitat	Provides additional information on bird sightings

Information Source	Theme	Instructions for using this information
Ontario Reptile and Amphibian Atlas	Wildlife Habitat	Provides additional information on Reptile and Amphibian sightings
iNaturalist	Fish & Wildlife Habitat	Provides additional information on fish & wildlife sightings

Appendix B: Natural Heritage Information Resources

The table below provides users links to Natural Heritage policies and documentation that should be referenced when conducting a natural heritage screening exercise. Click in the *Information Source* column for hyperlinks

Information Source	Theme	Description
https://www.ontario.ca/document/water-work-timing-window-guidelines	Water Work Timing windows	An information source that can be used to determine in-water work timing windows
Inland Lakes designated for Lake Trout management	Fish Habitat	A list of lakes in Ontario that are managed as Lake Trout lakes
Significant wildlife habitat guide	Wildlife Habitat	Provides detailed information on the identification, description and prioritization of significant wildlife habitat.
Significant wildlife habitat ecoregional criteria schedules: Ecoregion 6E	Wildlife Habitat	Provides detailed information on the description, criteria, information sources and assessment methods for significant wildlife habitat in Ecoregion 6E
Significant wildlife habitat ecoregional criteria schedules: Ecoregion 7E	Wildlife Habitat	Provides detailed information on the description, criteria, information sources and assessment methods for significant wildlife habitat in Ecoregion 7E
Significant wildlife habitat ecoregional criteria schedules: Ecoregion 5E	Wildlife Habitat	Provides detailed information on the description, criteria, information sources and assessment methods for significant wildlife habitat in Ecoregion 5E
Significant wildlife habitat ecoregional criteria schedules: Ecoregion 3E	Wildlife Habitat	Provides detailed information on the description, criteria, information sources and assessment methods for significant wildlife habitat in Ecoregion 3E
Significant wildlife habitat ecoregional criteria schedules: Ecoregion 3W	Wildlife Habitat	Provides detailed information on the description, criteria, information sources and assessment methods for significant wildlife habitat in Ecoregion 3E
Significant wildlife habitat ecoregional criteria schedules: Ecoregion 4E	Wildlife Habitat	Provides detailed information on the description, criteria, information sources and assessment methods for significant wildlife habitat in Ecoregion 3E
Significant wildlife habitat mitigation support tool	Wildlife Habitat	Provides advice and recommendations on how to mitigate wildlife habitat during a development process
Natural heritage reference manual	Natural Heritage	Provides guidance for implementing the natural heritage policies of the Provincial Policy Statement

Information Source	Theme	Description
Natural Heritage Information Centre Species of Conservation Concern	Species of Conservation Concern	Provides a link to view species of conservation concern including S (Sub-national) and G (Global) and N (National) rankings for each species. Definitions: Global rank (GRank): Experts from across the NatureServe network work together to assign global ranks. A global rank represents a species conservation status across its entire range. The most important factors biologists consider when they assign global ranks are the total number of known sites that exist world-wide, and the degree to which these sites are potentially or actively threatened with destruction. Other criteria include the number of known populations considered securely protected, the sizes of various populations, and the ability of the taxon to persist at its known sites. Global ranks are defined the same way as subnational ranks (SRanks). See subnational rank (SRank) for definitions. National rank (NRank): A national rank represents a species conservation status across its Canadian range. National ranks are the same as Canada general status ranks. National ranks are defined the same way as subnational ranks (SRanks). See subnational rank (SRank) for definitions.

Appendix C: Other information Sources

The table below provides users links to other data and resources that could be relevant when screening for development. Click in the *Information Source* column for hyperlinks

Information Source	Theme
Crown Land Use Policy Atlas	Crown Land
Make a Topographic Map	Base Data Mapping
Pits and Quarries	Aggregates
Aggregate resources policies and procedures	Aggregates
Aggregate resources study	Aggregates
Exploring for and extracting oil, natural gas and salt resources	Oil, Gas and Salt Resources
Petroleum wells	Oil, Gas and Salt Resources
Great Lakes – St. Lawrence River System and Large inland lakes: Technical Guides for flooding, erosion and dynamic beaches in support of natural hazards policies 3.1 of the provincial policy statement	Hazards
Adaptive Management of Stream Corridors in Ontario including Natural Hazards Technical Guides	Hazards
The Wildland Fire Risk Assessment and Mitigation Reference Manual	Hazards
Public Lands Act	Crown Land

Information Source	Theme
Crown land work permits	Crown Land
Aggregate resources	Aggregates
Lakes and Rivers Improvement Act	Crown Land
Licence to collect fish for scientific or education purposes	Fish
https://www.ontario.ca/search/data-catalogue	Base Data mapping
Fire - Potential Hazardous Forest Types for Wildland Fire	Hazards
MNR Region	Base Data mapping
MNR District	Base Data mapping
GeoBase	Base Data mapping
Mining Lands Administration System (MLAS) – Map Viewer	Mines
Geoconnections	Base Data mapping
Ministry of Northern Development and Mines Mapping and link to Geology Ontario databases	Mines

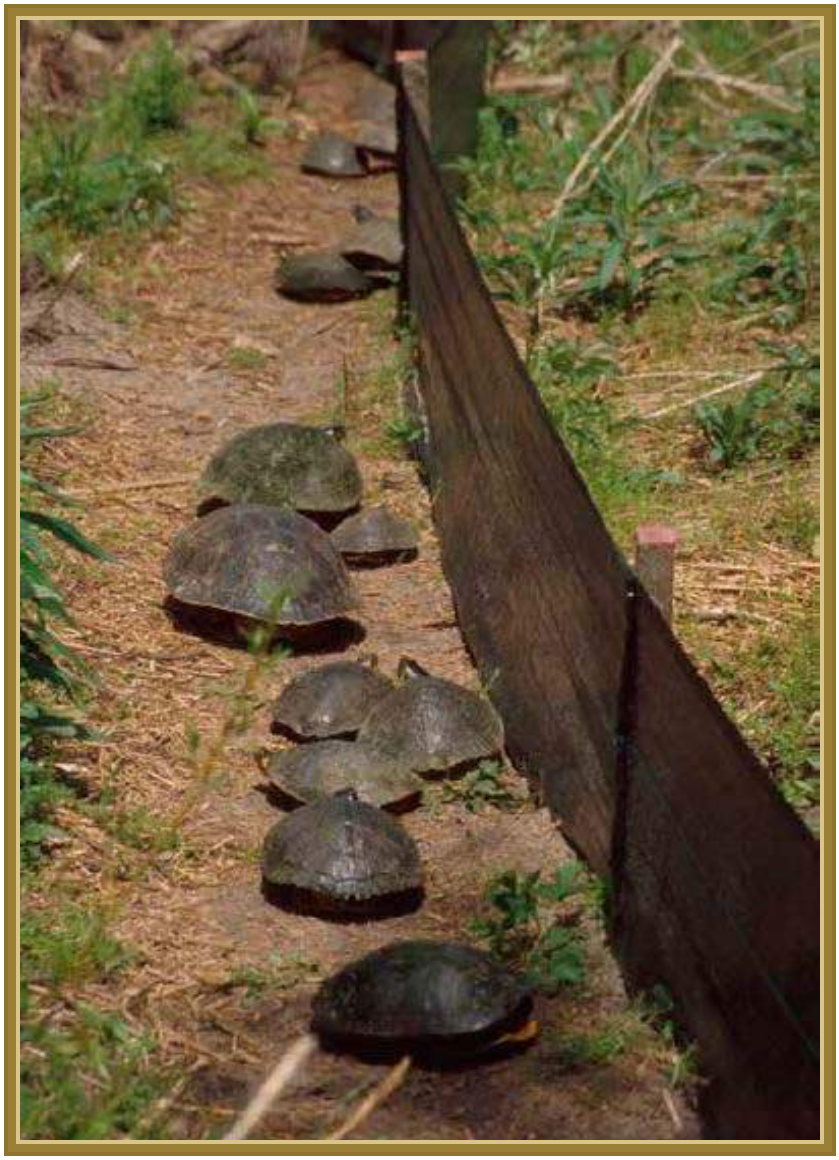
Information Source	Theme
Ministry of Environment, Conservation and Parks Data	Environment
National Air Photo Library	Aerial photos
Archives Ontario Aerial Photography	Aerial photos
GEOGratis	Base Data mapping
County Soils Maps	Base Data mapping
Forest Fire Info Map	Hazards
Agricultural Information Atlas	Agriculture
Crown Land Automated Internet Mapping System	Mines
COSINE	Base Data mapping
GEONAME	Base Data mapping
Government-wide data inventory	Base Data mapping

SPECIES AT RISK BRANCH
BEST PRACTICES TECHNICAL NOTE

REPTILE AND AMPHIBIAN EXCLUSION FENCING

Version 1.1

July 2013



Ministry of Natural Resources

Ontario

July 2013

Ontario Ministry of Natural Resources
Species at Risk Branch

Recommended Citation:
OMNR. 2013. Reptile and Amphibian Exclusion Fencing: Best Practices, Version 1.0. Species at Risk Branch Technical Note. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. 11 pp.

Cover illustration: Photograph by Matthew J. Aresco, Conservation Director, Nokuse Plantation

Before an activity can be initiated, permissions, approvals or authorizations may be required from MNR (e.g. Endangered Species Act authorization, Wildlife Scientific Collector's Authorization) or other agencies, levels of government (e.g. a conservation authority, municipality, federal or provincial government), or landowners. It is your responsibility to ensure that all necessary permissions, approvals and authorizations are acquired prior to proceeding with your activity.

This document presents information as of the point in time of publication and is meant to be updated through time as improved information becomes available.

Cette publication hautement spécialisée, Reptile and Amphibian Exclusion Fencing Best Practices n'est disponible qu'en anglais en vertu du Règlement 671/92 qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec le ministère des Richesses naturelles au Pamela Wesley,705-755-5217.

Document History

Revision Number	Revision Date	Summary of Changes	Originated	Reviewed	Authorized
1.1	**June, 2013**	**Pre-publishing edits**	**June, 2013**	**June, 2013**	**June, 2013**

REPTILE AND AMPHIBIAN EXCLUSION FENCING - BEST PRACTICES -

The purpose of this guidance document is to provide an overview of proven design and installation techniques for reptile and amphibian exclusion fencing. Though this document points to site and species-specific design requirements, it is important to recognize that every situation is different. This guidance is not meant to replace site-specific advice obtained from local MNR staff or experienced exclusion fencing contractors. Moreover, exclusion fences are only effective when well planned, properly constructed, and maintained.

Exclusion fencing seeks to eliminate access to specific areas where activities that could harm animals are occurring (e.g. active aggregate operations, construction sites, and roads). The selection and installation of exclusion fencing can present some challenges, particularly if multiple species are being excluded. For example, some reptiles and amphibians are able to dig under fencing while others can climb over. Some may also take advantage of burrows dug by other animals. To maintain effectiveness, the bottom of the fence should be buried or secured firmly to the ground and minimum height recommendations (Table 1) are considered.

Exclusion fence design should consider the target species as well as those that might be unintentionally impacted. Fencing material should not pose a risk of entanglement or permit individuals to pass underneath or between openings. Landscape features such as topography and substrate need to be considered as they may constrain fencing design.

Including plans for fencing in advance of a project can increase efficiency and fence effectiveness. For example, long-term road projects that will include a permanent sound barrier could design the sound barrier such that it also meets the specifications of the required exclusion fence.

EFFECTIVE FENCE CHARACTERISTICS

The fence burial and height recommendations listed in Table 1 below have been compiled from scientific literature, established management practices, and practitioner best advice. These are general recommendations and at times other specifications may be more appropriate. For instance, in areas where the substrate does not permit fence burial, weighing down the fence with heavy items (e.g. sand bags) or backfilling may be acceptable. Where needed, speak with your local MNR staff or experienced exclusion fencing contractor to develop site-specific plans.

If multiple species are being excluded from the same area, and the species-specific fencing specifications differ, the uppermost minimum height and greatest depth recommendation should be used (Table 1). If you are excluding both Blanding's Turtle and Gray Ratsnake, for example, the exclusion fence should be a minimum of 2 m tall (see Gray Ratsnake section below for additional details).

Exclusion fences should be installed prior to emergence from hibernation. A survey of the enclosed/secluded area should be conducted immediately following fence installation to ensure that no individuals have been trapped on the wrong side of the fence.

Table 1. Recommended burial depth and height requirements of exclusion fencing for reptiles and amphibians. Recommended height is the height of the fence after it has been installed including the buried components and any installed overhangs or extended lips.

SPECIES	RECOMMENDED DEPTH OF FENCE BURIED (cm) *	RECOMMENDED HEIGHT OF FENCE (cm) **
Turtles – general	10 – 20	60
Eastern Musk Turtle, Wood Turtle	10 – 20	50
Massasauga, Eastern Hog-nosed Snake, Butler's Gartersnake, Queensnake	10 – 20	60
Gray Ratsnake & Eastern Foxsnake	10 – 20	200
Fowler's Toad	10 – 20	50
Snakes - general	10 – 20	100
Common Five-lined Skink	10 – 20	unknown
Salamanders	10 – 20	30

*** does not include the 10 cm horizontal lip that should extend outward an additional 10 – 20 cm (see Figure 2)**
**** the height of fencing has been provided as an approximate. Fencing materials may in fact not be available in proportions that would allow for these precise measurements. It is most effective, if the height and burial depth recommendations are met.**

DURATION OF ACTIVITIES & DEGREE OF ANTICIPATED DISTURBANCE

The type of disturbance, the proximity to disturbance, and the planned fence longevity are factors that influence which type of exclusion fence is most effective. For short-term activities (i.e. 1 to 6 months) such as minor road repairs, a light-duty geotextile fence is appropriate. Longer term or permanent fencing projects, however, require more durable materials such as – heavy-duty geotextile, wood, concrete, woven-wire, sheet metal, vinyl panels, or galvanized mesh.

GEOTEXTILE FENCES

Geotextile fences (e.g. silt fences) come in many types and qualities. They can be very effective for the temporary exclusion of reptiles and amphibians. For the purposes of this document, temporary use ranges from a few months up to 2-3 years. Winter weather is generally damaging to geotextile materials and the cost of maintenance over the long-term should be considered during the planning phase. Depending upon the quality, geotextile can be resistant to UV degradation and the bio-chemical soil environment.

Light-duty Geotextile Fencing:

Light-duty geotextile fencing is made of nylon material and is typically purchased with wooden stakes pre-attached at 2 m to 3 m intervals (Plate 1). It can also come without pre-attached stakes. Light-duty geotextiles are largely intended for projects with shorter durations of only a few months in duration and up to one season.

Geotextile fencing with nylon mesh lining should be avoided due to the risk of entanglement by snakes.

To use light-duty geotextile fencing:

- Fencing fabric is effective if attached to wooden, heavy plastic or metal stakes using heavy-duty wire staples or tie-wire (Figure 2).
- Secure the fence on posts that are placed at 2 m to 3 m apart. If using the greater recommended distance between posts, additional maintenance may be required to maintain effectiveness.
- Securely drive the stakes into the ground to a recommended depth of 30 cm. The fencing fabric should be buried to the recommended specifications in Table 1 and back-filled with soil.
- For snakes, supporting posts should be staked on the activity side (e.g. on the side facing the aggregate stock pile or the road - Figure 2).
- Light-duty geotextile fences are not effective where rocks or other hard surfaces prevent proper anchoring of fence posts and burial of the fence fabric.
- Light-duty geotextile fences are not effective where a large amount of concentrated run-off is likely or to cross streams, ditches or waterways without specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice and recommendations.
- See general best practices section below for additional details.

Generally, light-duty geotextile fences are not effective if they exceed 1 metre in height unless purposely manufactured for greater height (e.g. stakes placed at closer intervals or cross braces). If greater height is required consider using heavy duty geotextile, hardware cloth or other fencing materials.

Plate 1. Light-duty geotextile fencing with pre-attached wooden stakes used to exclude turtles from a road as seen on a regular maintenance check (photo credit: Brad Steinberg).

Heavy-duty Geotextile Fencing:

Heavy-duty geotextile fencing is typically constructed of a thick felt-like fabric. It may also be called ‘double row’ or ‘trenched’ fencing. For support, this fencing uses a woven wire fence (e.g. chain link) or some other structure (Plate 2). It is recommended that a minimum density of 270R or equivalent woven geotextile fabric is used.

Heavy-duty geotextile material can be effective for up to 2 or 3 years with proper maintenance. This type of fencing can be damaged by small mammals chewing through or torn by heavy debris (e.g. tree branches). Therefore, it may be best suited to turtles, which are less likely to take advantage of holes or tears in the fabric. If

used to exclude snakes or other animals, more maintenance may be required.

Heavy-duty geotextile fencing:

- The wire fence should be installed on the activity side to prevent animals from leveraging and climbing into the exclusion area while allowing the animal to escape if they find themselves on the wrong side (Figure 2).
- Geotextile fences across streams, ditches or waterways should have case-specific modifications.
- Contact your local MNR staff or experienced exclusion fencing contractor for advice.
- See light-duty geotextile section above and general best practices below for additional details.

Plate 2. Example of a heavy-duty geotextile fencing used to exclude snake species (photo credit: Jeremy Rouse).

HARDWARE CLOTH FENCES

Hardware cloth (also known as galvanized mesh or Birdscreen) is durable, cost effective and useful for excluding reptiles and amphibians. The fence should be made of heavy galvanized hardware cloth with a ¼ inch mesh. For fences intended to exclude small snakes, a ⅛ inch mesh may be more effective. In contrast, fencing intended to exclude turtle species can have a larger mesh size (e.g. ½ inch). Larger mesh may have a longer lifespan as it is constructed from a thicker material compared to smaller mesh sizes.

To use hardware cloth fencing:

- Secure the fence on posts placed a recommended 2.5 m apart with the stakes on the activity side (Figure 2).
- Pull the mesh taught and staple or secure with screws and a metal stripping to prevent the mesh from being ripped when pressure is applied.
- Installing a top rail or folding the mesh over a taut smooth wire reduces tearing (Plates 3 and 4).
- An outward facing lip installed on the species side ensures that snakes and amphibians are unable to climb or jump over the fence (Figure 2; Plate 4)
- Tears can be mended with 18-gauge galvanized wire.
- See general best practices section below for additional details.

Plate 3. Example of a galvanized mesh fencing used for the long-term exclusion of snakes and turtles from the adjacent highway (photo credit: Megan Bonenfant).

Plate 4. Long-term to permanent exclusion fencing using galvanized mesh with over-hanging lip to prevent animals from climbing or jumping over (photo credit: Megan Bonenfant).

WOOD LATH SNOW FENCING

In certain circumstances, wood lath snow fencing can be effective at excluding turtles. This fencing is typically constructed from soft wood slats that have been woven together with 13-gauge wire and is then attached to steel fence posts which have been driven into the ground.

Wood lath fencing is cost effective and can easily be laid down during the winter to prevent damage. The durability of the material, however, is not meant for very long-term use (e.g. more than 3 years), unless regular maintenance occurs.

To use wood lath snow fencing:

- The fencing should be attached to heavy plastic or metal stakes using heavy-duty wire staples or tie-wire.
- The stakes are recommended to be placed at 2 to 3 m intervals and securely driven into the ground 30 cm or more.
- Wood lath snow fencing across streams, ditches or waterways should have case-specific modifications.
- Wood lath snow fencing lends itself well to being combined with other types of material to ensure complete exclusion.
- See general best practices section below for additional details.

Plate 5. Example of a wood lath snow fencing used to exclude turtles (photo credit: Karine Beriault).

EXCLUSION FENCING FOR GRAY RATSNAKE AND EASTERN FOXSNAKE

Gray Ratsnake and Eastern Foxsnake are the largest snakes in Ontario - reaching nearly 2 m in length. They are also excellent climbers. For this reason, fencing intended to exclude either of these species has additional recommended design specifications.

- The fence should be at least 2 m high.
- The material on the species side (Figure 2) should be smooth to prevent the snakes from climbing into the excluded area.
- Stakes should be on the activity side of the fence (Figure 2).
- Due to the increase in fence height, it is valuable to decrease the distance between posts or install diagonal braces.
- See general best practices section below for additional details.

CONCRETE, SHEET METAL & VINYL WALLS

Concrete, metal or vinyl walls can stand alone or be combined with woven wire or chain link fences. They are durable, require minimal maintenance and are effective in excluding target species from high risk areas and guiding them to crossing structures or other desired locations (Plates 6 and 7). This fence type is comprised of a continuous vertical face of concrete, metal or vinyl sheeting with no gaps. Concrete walls can be installed as either pre-cast sections or pour directly in place.

Plate 6. Stand-alone continuous concrete wall used to exclude salamander species installed as pre-cast forms (photo credit: Steven Roorda).

Plate 7. Pre-formed vinyl sheeting fence intended to exclude salamanders for a construction site (photo credit: Herpetosure Ltd.)

The wall height depends upon the target species, but they are usually between 45 and 60 cm tall and buried 25 cm. Concrete, metal or vinyl exclusion fencing is most appropriate for salamanders, skinks, small snakes, and small turtles. For large turtle species, a chain link fence can be installed directly on top of the concrete wall for complete exclusion.

HABITAT CONNECTIVITY

Habitat connectivity is the connectedness between patches of suitable habitat or the degree to which the landscape facilitates animal movement. Exclusion fencing installed along roads or other large projects can effectively reduce or eliminate habitat connectivity for animals. In these scenarios, exclusion fencing should be considered with eco-passages in order to maintain connectivity. Fencing in isolation should be viewed as a temporary method to reduce mortality until species movement can be restored. Where eco-passages are not feasible they should be identified for consideration with any future road work or development to improve connectivity.

During the installation of fencing with an eco-passage, it is important that the fencing sits flush with the passage to ensure that

there are no gaps where animals can squeeze through.

Plate 7. A wood turtle travelling through a dry eco-passage. Ecopassages such as this help to ensure the long-term connectivity of seasonal habitat for this and other reptile and amphibian species (photo credit: Amy Mui).

GENERAL BEST PRACTICES:

- To deter digging, bury the fence 10 cm down with an additional 10 cm horizontal lip (Figure 2).
- Backfill and compact soil along the entire length on both sides of the fence (Figure 2).
- Once the fence is installed, a survey should be done to ensure that no individuals have been trapped inside (speak with MNR for survey advice).
- Exclusion fencing intended to exclude snakes should have the stakes installed on the activity side (opposite the normal requirement for sediment control fencing) to prevent snakes from using the stakes to maneuver over the fencing.
- For snakes and toads, the fence should have an overhanging lip on the species side (Figure 2).
- Fences should be inspected after spring thaw and at regular intervals throughout the active season, especially following heavy rain events. This is particularly important for geotextile fences. Any damage that affects the integrity of the fence (e.g. tears, loose edges, collapses, etc.) should be fixed promptly.
- Tall or woody vegetation on the species side of the fence should be managed if there is a risk that it may enable the animals to climb over. This is most important during spring and fall. Proceed cautiously to not harm animals protected plant species during vegetation removal.
- When installing an eco-passage, fencing or exclusion walls should be used as a guiding system to direct animals to passage openings.
- Natural screens such as trees or shrubs can help to reduce road access and can be combined with fencing to provide protection of individuals from predation.
- Install fences with a turn-around at the ends furthest from the wetland habitat and at any access areas to assist in redirecting animals away from any fence openings (Figure 1).
- Curving the ends of the fencing inward (i.e. away from the road or construction site) may help to reduce access to these locations. The ends may also be tied off to natural features on the landscape such as trees or rock cuts.

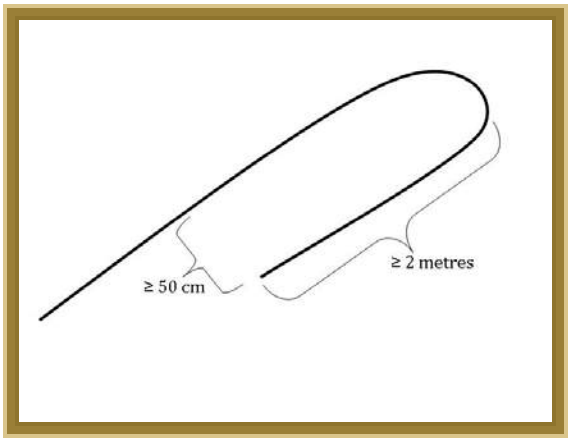


Figure 1. Diagram of the ends of the fence designed to curve inward in order to direct animals away from the area of exclusion.

WATER MOVEMENT & DRAINAGE

- In areas where surface water run-off may erode a soil-based backfill, consider using rocks or sand bags. Ensure these materials cannot be used by animals to climb over the fence.
- Where possible, minimize the number of water crossings: when necessary, it should occur where flow is minimal.
- Fence posts in waterways or areas prone to seasonal flooding should be driven rather than dug – unless following established best practices.
- Fencing should be placed above the high water mark anticipated for high water events such as spring freshet or periods of heavy or continuous rainfall.

TOPOGRAPHY:

- Fence posts should be closer together in undulating topography.
- Fences installed on slopes have a different effective height depending upon whether the animal will be approaching from the up or down slope. The fence height can be adjusted accordingly.

Improvements or questions regarding exclusion fencing can be brought to the local MNR Species at Risk Biologist or other MNR staff.

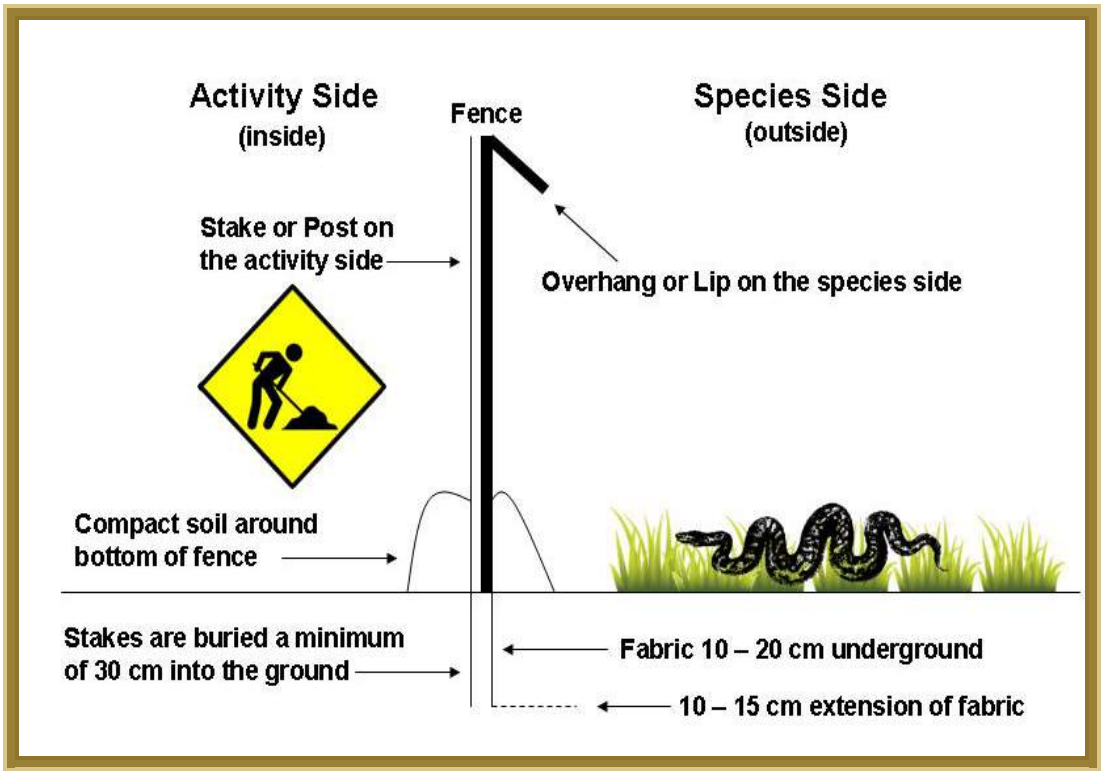


Figure 1. A side view of a basic exclusion fence including an overhang or flexible lip to deter animals from climbing or jumping over the fence. Placement of the stake on the Activity Side or on the inside of excluded area is also illustrated. This is particularly important for snake species which may use the stakes to maneuver over the fence.

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For additional information:

Visit the species at risk website at
ontario.ca/speciesatrisk
Contact your MNR district office
Contact the Natural Resources Information Centre
1-800-667-1940
TTY 1-866-686-6072
mnr.nric.mnr@ontario.ca
ontario.ca/mnr

TECHNICAL BULLETIN

Standards Development Branch **December 2015**

MANAGEMENT APPROACHES FOR INDUSTRIAL FUGITIVE DUST SOURCES

The Procedure for Preparing an Emission Summary and Dispersion Modelling Report (Guideline A-10) (Chapter 7.4) sets out criteria for assessment of suspended particulate matter (SPM) from fugitive dust sources. In some cases, SPM emissions may be excluded from an ESDM report if: 1) the fugitive dust emissions do not contain contaminants with health-based standards (i.e. metals); and 2) the emissions are negligible or are minimized through the effective implementation of a fugitive dust control plan, consistent with best management practices.

This technical bulletin is intended as an overview of best management practices for industrial sources of fugitive dust emissions. The information includes typical sources, their impact and the common abatement technologies and techniques considered to be effective at the time of issuance. If a facility has been issued a legal instrument with more specific requirements for fugitive dust control, or is registered to a technical standard, or is operating under a site-specific standard under Ontario Regulation 419/05 (O. Reg. 419/05[1]) that may have more specific requirements prescribed, and these other legal instruments shall take precedence over this technical bulletin.

1.0 INTRODUCTION

In this document, dust is defined as small solid particles which settle out under their own weight but which may remain suspended for some time[15]. Mechanical disturbance of granular material can generate a significant amount of dust[2]. The amount of dust emission is affected by a wide range of factors such as material characteristics (e.g. particulate size distribution), climatic conditions (e.g. wind and precipitation), control measures in place (e.g. wind screen, stabilizers, wet suppression), and the amount and frequency of mechanical disturbance to which the material is exposed[5].

Once dust is emitted (put in suspension), it will travel away from the source again affected by various parameters, including meteorological conditions and particulate size distribution. For a typical mean wind speed of 16 km/hr, particles larger than 100 μm in size are likely to settle within 6 to 9 metres of the source, particles between 30 to 100 μm in size are likely to undergo impeded settling, and depending upon the extent of atmospheric turbulence, are likely to settle more than 100 metres from the source. Particulates that are less than 30 μm in size do not settle as easily and can travel even longer distances before deposition[3]. Wind speed and direction have a significant influence on the dispersion of the dust.

Fugitive dust emissions are recognized as a significant issue by regulatory agencies such as the United States Environmental Protection Agency (USEPA)[9] and the Ontario Ministry of the Environment and Climate Change (MOECC). The effects of the dust are related to the particle size distribution, the composition, the amount emitted and the dispersion pattern. These effects can range from surface staining to health impacts, depending upon the factors involved.

Past reviews of facilities have shown that unless appropriately controlled, fugitive sources often contribute to the total site emissions as much as or greater than process sources. As a result it is important to include fugitive sources in the modelling assessment of off-site concentration levels of contaminants.

Best management practices (BMP) plans are normally in place for a wide variety of facilities where dust, also known as suspended particulate matter (SPM), is generated and emitted from open sources including roads, storage piles and other sources related to materials management. BMP plans may include the introduction of control or cleaning equipment and may also include implementation of new procedures. There is a significant amount of published information on the control of fugitive dust emissions[3,4,5,6,7,8,9,12,13,14].

2.0 MAIN SOURCES OF FUGITIVE DUST EMISSIONS

Fugitive dust can be emitted from vehicle traffic on paved or unpaved roads (or surfaces), blow-off from the load during haulage, loading and unloading of materials, products or packaging, handling of materials, screening and sorting, dry sweeping, and wind erosion of storage piles, berms and road surfaces[3,4,5,6,7,8,9].

Open storage of granular materials and material handling can result in dispersion of the dust to a wider area, which may then be re-suspended by vehicle traffic or wind. Fugitive dust is also formed by wind erosion of exposed surfaces and piles. By reducing the primary emission source, less effort is required on the secondary sources, which typically result from re-entrainment/re-suspension.

Other common industrial activities that may contribute to fugitive dust emissions include but are not limited to welding, torch cutting, trimming, blasting, drilling, crushing, grinding, sawing and screening.

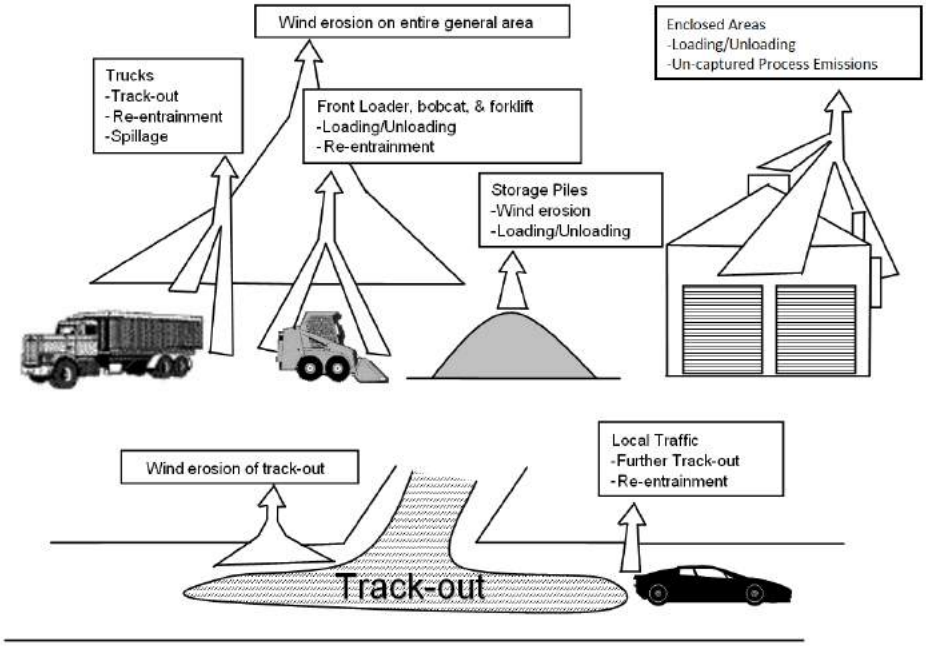

Figure 1: Examples of Common Sources of Industrial Fugitive Dust

3.0 ELEMENTS OF A BEST MANAGEMENT PRACTICES (BMP) PLAN

The key to an effective fugitive dust control program at a facility is the implementation of a Best Management Practices (BMP) plan specific for the site. A BMP plan should include the following elements:

a) Plan
- identify and characterize the sources of fugitive dust emissions within the facility
- identify nearby potential receptors that may be impacted by dust emissions
- develop a site map and/or figures to identify the locations of fugitive sources (such as storage piles and roadways) and potential receptors
- characterize dust parameters such as silt loading, moisture content, metal content etc. as applicable
- review the composition and particle size distribution of dust generated by each significant fugitive source where available
- identify the contributing factors for each significant source that favour the generation of fugitive dust emissions (e.g. predominant wind direction, location of storage pile, frequency of activity, process operating parameters, control efficiency etc.)
- prioritize the use of resources based on the relative contributions of fugitive sources
- describe how fugitive dust will be controlled from each significant source

b) Do
- document how the control measures will be implemented with timelines
- describe proper operating, maintenance, calibration, monitoring, sampling and record-keeping procedures of control and monitoring equipment
- include a program for site-wide training for facility personnel and contractors

c) Check
- implement a regular inspection, maintenance and calibration program
- describe methods of reviewing information collected from monitoring, sampling and record-keeping to verify and document ongoing implementation of the plan

d) Act
- review the effectiveness of control measures using available data from site inspections, silt loading analysis etc. as applicable on a regular basis to identify opportunities for continuous improvement
- update the BMP plan as required.

4.0 BEST MANAGEMENT PRACTICES

For any source of fugitive dust, preventative measures should first be considered in order to eliminate or reduce the primary generation of dust emitted and the ensuing secondary re-entrainment. However, mitigation measures (such as dust collection, dust suppressant application, solid fence etc.) may be necessary in order to achieve the required level of control. In addition, other measures (such as monitoring and sampling, inspection etc.) may be required to determine whether the fugitive dust control program is effective.

4.1 Process Sources

Fugitive dust generated from industrial processes varies significantly from sector to sector. In general, it may be originated from an indoor process that emits dust to the natural environment through a door, window, opening, vent or stack, or an outdoor activity such as storage, transfer and handling of materials or products.

Fugitive dust emissions generated from an indoor or outdoor process source should be minimized by:

- Considering alternative processes/equipment to eliminate or minimize primary dust generation
- Eliminating open burning
- Minimizing outdoor activities involved with fabrication of materials such as cutting, grinding etc.
- Relocating an outdoor activity indoors for better fugitive dust control where feasible
- For indoor processes, ensuring that doors, windows and other building openings are kept closed where practical
- Maintaining processes and controls under negative pressure to minimize escape of fugitive emissions into the natural environment where feasible
- Reviewing and maintaining dust capture efficiencies of air handling systems (hood location, enclosure, velocities, overall air balancing)
- Ensuring integrity of material transfer equipment
- Wetting material prior to processing or loading where possible
- Fitting silos with overfill detection using automatic shut-off valves
- Installing and maintaining process containment and redirecting dust emissions to the dust collection system such as baghouse, scrubber etc.
- Implementing a preventative maintenance program for processes and control equipment

4.2 Storage Piles

Emissions from storage piles can result from dust pick-up at wind speeds over 5 m/s[13]. Emissions can also occur as material is dropped from a conveyor, loader or other equipment where there is an associated drop height onto the storage pile.

The dust control options for storage piles can include enclosures, barriers, shelters, proper layout, covers, and water application.

4.2.1 Enclosures

Covered storage of very fine materials with a high dust emitting potential should be considered especially where emissions may impact a sensitive receptor. Silos, bunkers or hoppers should be used where feasible. Their doors should be kept closed. Properly designed ventilation and filtering systems should be used as appropriate.

Enclosures (full or partial) for inactive piles are effective in reducing wind erosion and controlling fugitive dust emissions from storage piles. Examples of enclosures include:

- A three-sided bunker that is at least as high as the storage pile – The length of the sides should be at least the length of the pile; the distance of the sides from the pile should be no more than twice the height of the pile; the height of the sides should be

equal to the pile height; and the material of which the sides are made should be no more than 50% porous;

- A storage silo – Bulk cement, bentonite and similar fine dry materials (e.g. less than 3 millimetres in particle size) should be stored in silos. Silos should be equipped with dust control technology (e.g. fabric filters); and

- Buildings - Open-ended buildings or completely enclosing the pile within a building furnished with dust control technology[14].

4.2.2 Barrier and Shelter

Wind erosion can be reduced by locating storage piles against one or more barriers made of durable materials such as cement block. Very fine materials should be stored in a sheltered area where feasible.

4.2.3 Location, Height and Slope of Piles

Storage piles should be located away from the prevailing downwind site boundaries where practical, or in designated areas with windbreaks and restricted traffic, and as far away from residents and other sensitive receptors as possible. Where seasonal variability is significant for processes, wind direction or precipitation patterns, the worst case scenario should be considered where feasible.

Wind effects can be reduced by keeping the storage pile heights below the level of the windbreak. In addition, storage piles should be maintained so that the longitudinal axis is parallel with the prevailing wind.

Limiting the height and slope of storage piles can reduce wind erosion and entrainment. For example, a flat shallow storage pile is subject to less wind turbulence than one with a tall conical shape.

The number of piles should be kept to a minimum for the same material (i.e. one pile instead of multiple piles will reduce fugitive emissions)[12].

4.2.4 Covers on Piles

Open storage piles may be covered with durable materials such as tarpaulins or plastic. Alternatively, soil or latex binder may be applied on the top of the pile to reduce wind erosion of the material. For piles that are inactive, a vegetative cover may also be used.

When covers are used, they should be anchored to prevent being blown away. Small or short-term inactive storage piles should be enclosed or kept under sheeting while larger inactive storage piles should be shrouded, capped or grassed over[12].

4.2.5 Water/Dust Suppressant Application

Where feasible, smaller particulate matter or fines should be rinsed out prior to stockpiling.

Water or dust suppressant that is compatible with the stored material can be applied to the surface of the storage pile to reduce wind erosion by keeping the material moist. This control

measure also applies to other sources of dust including unpaved roads, conveyors etc. This option is also discussed under Section 4.5 Yard Management.

4.3 Transport of Materials

Appropriate techniques for controlling fugitive dust along the haul roads include: paving roadways, covering loads in the bed of the truck, cleaning the bed of the truck after unloading and cleaning the wheels of the truck after unloading. These techniques are summarized below.

4.3.1 Paved Surfaces (including Paved Roads)

Dust deposits on paved surfaces (or hard unsurfaced material) can be re-dispersed by wind or by vehicle movements. Dust pick-up by wind is usually only significant at wind speeds above 5 m/s, but vehicle re-entrainment can occur under any conditions.

Dust emissions from paved surfaces can be minimized through the use of the following practices:

- Control movement and handling of fine materials to prevent spillages onto paved surfaces
- Regular cleaning of paved surfaces, using a mobile sweeper in conjunction with vacuuming, or a water truck (see Section 4.3.5)
- Speed controls on vehicle movements (see Section 4.3.4)
- Windbreak measures (see Section 4.5.1)[13].

4.3.2 Unpaved Surfaces (including Unpaved Roads)

For the control of fugitive dust emissions from truck traffic on haul roads and parking lots, paving of these areas must be considered. Hard surfaces of asphalt or concrete may be applied. Paving can be highly effective but it may be unsuitable for surfaces used by very heavy vehicles or subject to spillages of material in transport.

If paving is not practical, the high traffic areas of unpaved roads should be covered with large aggregates or lower silt materials (such as gravel) to reduce track-out. The use of gravel can be moderately effective, but repeated additions will usually be required.

Dust emissions from unpaved surfaces can be controlled using the following practices:

- Wet suppressant should be applied during dry period using a water truck and/or fixed sprinklers. As a general guide, the typical water requirements are up to 1 litre per square metre per hour and vary depending on the precipitation.
- Chemical stabilization can be used in conjunction with wet suppression, and is best suited for permanent site roads. This involves the use of chemical additives in the water, which help to form a crust on the surface and bind the dust particles together, Chemical stabilization reduces the watering requirements, but any savings can be offset by the cost of the additives. Repeat treatments are usually required at intervals of 1 – 4 weeks. (Note: chemical suppressants must not cause any adverse effects on the environment)[13].
- Mud and dust track-out from unpaved roads should be minimized by the use of wheel wash facilities.

4.3.3 Truck Travel Route

Truck traffic should be restricted to defined roads and monitored where feasible. The travel routes for haul trucks should be established and demarcated in order to minimize vehicular disturbances of erodible surfaces. Travel distances can be minimized through effective site layout and design.

4.3.4 Speed Controls on Vehicle Movements

Reduced speed limits should be enforced within the site on the truck travel routes, with clear signs posted at areas most susceptible to high levels of fugitive dust. A speed limit of 10 – 15 km/hr is commonly applied. Dust emissions increase approximately linearly with the vehicle speeds. In other words, a speed reduction from 30 km/hr to 15 km/hr is expected to achieve about a 50% reduction in dust emissions[13].

4.3.5 Road Maintenance/Cleaning

Any mud, dirt, or debris on paved roads should be removed on a regular basis. A dry street sweeper/vacuum system can be used, although it is more effective to use water flush in combination. If water is used, runoff should be controlled in order not to enhance track-out by saturating the surface of adjacent roads.

For unpaved roads dry sweeping is generally not recommended. This measure may cause elevated dust emissions and should be avoided unless there is no other option.

Water or dust suppressant should be applied on unpaved roads to reduce fugitive dust emissions caused by traffic and track-out. Since this control measure also applies to other sources, it is discussed in detail under Section 4.5 Yard Management.

4.3.6 Freeboard for Truck Loads

To prevent air entrainment and spillage during transportation, bulk materials must be transported in trucks with adequate freeboard, so that no part of the load should come within a safe distance of the top of any side board, side panel or tail gate of the truck. If feasible, trucks should be loaded such that the freeboard is at least 7 cm[14].

4.3.7 Covers on Truck Loads

All vehicles entering and leaving the site and carrying a load that may generate dust should be covered whenever feasible, except during loading and unloading of materials. Bulk materials transported by trucks may be covered with durable materials such as tarpaulins or screening material that are extended over the truck bed and secured to the truck.

4.3.8 Cleaning of Trucks and Covers After Each Load

After each hauling trip, particulate adhering to the wheels, tires, roof, undercarriage, and other exterior surfaces of the vehicle should be removed before leaving the site. This can be accomplished by installing a wheel washing station and maintaining replenishment of the wash water. Other mechanical equipment such as truck shaker may also be effective for removing the larger particles. In addition, all surfaces that are in contact with the bulk materials should be regularly cleaned to prevent the buildup of excessive dust in and on the truck over time. As an additional measure, the truck cover should be regularly replaced with a cleaned one as applicable.

4.3.9 Sampling of Road Dust and Storage Piles

The Procedure for Preparing an Emission Summary and Dispersion Modelling Report (Guideline A-10) (Chapter 7.4) sets out criteria for assessment of suspended particulate matter (SPM) from fugitive dust sources. Certain sectors as listed in Table 7-2 of the Procedure may be subject to determination of metal content.

Samples of road dust should be collected and analyzed for the silt loading, particle size distribution and metallic composition as required. The recommended protocols for sampling and analysis of road dust can be found respectively in USEPA AP-42, *Compilation of Air Pollution Emission Factors, Appendix C.1 Procedures for Sampling Surface/Bulk Dust Loading*[10], and USEPA AP-42, *Compilation of Air Pollution Emission Factors, Appendix C.2 Procedures for Laboratory Analysis of Surface/Bulk Dust Loading Samples*[11]. Since the composition and loading of silt can vary significantly throughout the year, assessment should be based on a series of tests, not a single value. The dust control plan should reflect these analyses and ongoing visual inspections of the site.

4.4 Material Handling/Transfer Activities

Control of dust emissions generated during material handling activities is primarily accomplished by preventing dust emissions due to loading, unloading and transfer activities in the open air.

Where feasible, activities that take place at an existing storage pile (i.e., loading and unloading) should be confined to the downwind side of the storage pile.

4.4.1 Use of Conveyors and Enclosures

Dust emissions from conveyors can be caused by wind pick-up and through losses during loading, discharge, and at transfer points, depending on the particle size distribution of the material.

In general, conveyors should be designed to minimize material overflow or spillage. Where feasible, they should be enclosed and filtered through a dust collection system. Continuous transport such as conveyors should be applied because it generates less dust emissions than discontinuous transport such as shovel or truck. However this measure may not be feasible or cost effective for an existing facility.

Dust emissions from conveyors can be controlled using the following practices[12,13]:

- Optimize the conveyor speed
- Avoid loading conveyor belt up to its edges
- Use enclosures or housings for conveyors for fine material
- Use water sprays or sprinklers at conveyor transfer points
- Minimize drop heights at transfer points, including use of conveyors that can be raised and lowered
- Perform regular clean-up of spillages around transfer points.

4.4.2 Transfer Techniques

Material handling using front-end loaders or mechanical grabs is another potential source of dust emissions. These mainly occur when the load is dropped into a truck or hopper, but can

also be caused by spillages during handling. Similar problems can occur when dusty loads are transferred by gravity discharge from hoppers into trucks[12].

There are numerous techniques that can reduce dust emissions from the transfer and handling of solid materials. Below are a few examples[12]:

- Empty a truck in a roofed or partly enclosed unloading station
- Minimize the speed of descent
- Minimize the free fall height (drop height)
- Optimize the use of mechanical grabs (geometric shape, load capacity, smooth surface)
- Use sprinklers or water sprays around hoppers and other transfer points
- Install hooding or enclosure for significant fugitive sources such as hopper load systems, with the emissions being ducted to bag filters or other dust control equipment
- Conduct regular maintenance of hydraulic grabs to ensure complete closure
- Design hopper load systems to ensure a good match with truck size.

4.4.3 Water Application

Water spray can be applied to the conveyor belt and transfer points to reduce wind erosion by keeping the material moist. Since this control measure also applies to other sources, it is discussed in detail under Section 4.5 Yard Management.

4.4.4 Scheduling of Loading/Unloading Activities

Where feasible, the loading and unloading activities should be conducted when the wind speed is low in order to minimize fugitive dust emissions. In very high wind conditions, these activities should be suspended where practical.

4.5 Yard Management

4.5.1 Windbreak Measures

Wind is a major cause of dust emissions from industrial sites. Wind speed near the pile surface is the primary factor affecting particle uptake from storage piles.

The effects can be partially mitigated through the use of shelter belts or temporary screening. It may also be possible to make use of natural land features, or artificial features such as noise barriers, to provide a degree of wind protection. This option should be considered in the initial development of the site layout and design[13].

Berms, tree lines or vegetation should be used in the surrounding areas of the yard where practical. Professional horticultural advice should be sought regarding suitable species for any specific site[13].

A windbreak can be effective when constructed to the following specifications[13]:

- minimum height equal to the pile height,
- minimum length equal to the pile length at the base,
- located at a maximum distance of one pile height from the base of the pile.

Windbreaks can be constructed using horticultural cloth supported on poles. Solid or fabric fences may also be used as an effective wind protection measure. Detailed guidance on wind fencing includes the following:

- One to two-metre high barriers with 50% or less porosity should be used[14].
- The bottom of wind fences should be sufficiently anchored to the ground to prevent material from blowing underneath the fence.

Barriers placed at right angles to prevailing wind currents at intervals of 15 times the barrier height are suggested to be the most effective in controlling wind erosion.

- Windbreaks and fabric fences should be maintained in an upright and functional condition at all times.
- All accumulated material on the windward side of the windbreak should be periodically removed to prevent failure of the windbreak[14].

4.5.2 Re-vegetation

Re-vegetation of exposed surfaces should be conducted wherever practicable at mines, quarries and construction sites, and any other similar activities subject to ongoing site development.

A progressive re-vegetation plan should be implemented to reduce wind and rain erosion of berms or disturbed areas within 10 days after active operations have ceased, where feasible. This plan should include consideration for a downwind shelter belt, identification of plant species mix, a planting schedule and maintenance program. Techniques such as hydro-seeding and the use of geotextiles should be used on sloping ground and other difficult surfaces.

Ground cover should be of sufficient density to expose less than 30% of unstabilized ground within 90 days of planting, and all times thereafter. Such restoration control measures should be maintained[14].

4.5.3 Water/Dust Suppressant Application

Application of water or approved dust suppressant is a common practice used on wind exposed storage piles, conveyor belts, connection points, drop points, truck loads, unpaved roads, and excavation areas. Water can be applied by a variety of methods, for instance water trucks, water pulls, water cannons, hoses, fire hydrants, sprinklers, etc.[14] However, application of this control measure may be limited by the risk of freezing, slippery situations or water shortage. In addition, there are also potential environmental consequences resulting from over-application of water that must be considered. These include: runoff problems, soil instability, spreading of contaminants (e.g. oil or coolant from engines), and erosion.

Chemical dust suppressants can be more effective than water in controlling dust with less frequent applications. However, the selection of chemical dust suppressant must take into consideration the hazardous, biodegradable and water-soluble properties of the substance and the effect of its application on the surrounding environment[14].

The rate of water or suppressant application varies with the site and material, and should be determined by the local weather conditions such as rainfall, relative humidity, temperature, evaporation rate and wind speed.

The control efficiency of water or suppressant application depends on the traffic volume, application rates, wind direction and other weather conditions. In addition, the equipment such as water trucks and sprinkler systems must be properly maintained to be effective.

4.5.4 Weather Monitoring

The local weather forecast including wind direction, wind speed, rainfall, relative humidity, temperature and evaporation rate should be monitored using available resources or meteorological instruments such as an anemometer (or wind meter), in order to optimize the application rates of water or dust suppressant.

Continuous monitoring of wind conditions should be considered when dust generating activities are to be carried out in a sensitive location. The information can be used as a trigger for increased dust control activities (e.g. wind speed above 5 m/s), or even as a signal for work to cease (e.g. wind speed above 10 m/s)[13].

4.5.5 Spillage/Overflow

Good housekeeping is the key to reducing wind erosion and track-out. Limiting the load size, and controlling the movement and handling of fine materials can avoid spills. Any material spillage or overflow at loading/unloading areas or on roads should be cleaned up immediately before they are picked up by high winds or disturbed by vehicle traffic. Off-site spillage should be collected and returned to the site for proper disposal.

4.5.6 Record-keeping

Procedures should be implemented to ensure that any documentation and information recorded as a result of any activity included in the BMP plan, including but not limited to monitoring, measurement, sampling, maintenance, analysis, activity logging, site inspection, training and community feedback, is retained at the facility for a minimum period of two years, or as required by a facility specific Environmental Compliance Approval, and is made available to the ministry upon request as soon as practicable.

4.5.7 Site Inspections

A site inspection plan should be developed that includes procedures for visual inspections of fugitive dust emissions throughout the site. Appropriate control measures should be applied promptly to address any excessive emissions, with follow-up observations to ensure the effectiveness of the measures. A formal inspection form should be used (example shown in Appendix A) for listing the inspection items and recording any observations of potential issues and/or corrective actions for follow-up.

Storage piles and open un-vegetated areas should be observed for fugitive dust. Water or suppressant application should be conducted as required. Plant equipment, conveyors and enclosures should be inspected for physical integrity. Any equipment or seal leaks should be repaired as soon as practicable.

Site inspections should be conducted according to need, with special emphasis on the dry season. Observations for the conditions that contribute to generation of fugitive dust emissions should be made. Issues identified through the site inspection may necessitate a revision to the BMP plan.

4.5.8 Training

A formal training program should be developed for all personnel including contractors, including their roles and responsibilities in terms of developing and implementing actions with respect to the facility's BMP plan. The training frequency, topics, and methods, as well as record-keeping procedures should be clearly identified.
All staff responsible for site inspections should be appropriately trained on the inspection criteria, including the proper completion of inspection forms, and response procedures to excessive visible dust.

Surveys should be conducted regularly to solicit feedback from site personnel and contractors on the effectiveness of dust control measures in order to identify opportunities for continuous improvement.

4.5.9 Community Feedback

When regular complaints occur, procedures for regular consultation and communication with the affected community should be set up. Where appropriate, a dust monitoring program with trigger levels for actions should be considered.

Prompt responses to complaints can be important in developing strong communications with the surrounding community. Effective complaint investigation is important for identifying areas of the operation where dust control procedures need improvement.

5.0 CONTINUOUS IMPROVEMENT

A BMP plan should be a comprehensive site-specific document that identifies all fugitive sources of dust emissions from the site and the best management practices for controlling these sources. This plan must be reviewed and updated on a regular basis. It should build on current and known practices with a commitment to continuous improvement. In addition, consideration should be given to process changes or material substitution that would result in reduction of fugitive dust. Where justified, the plan should be adjusted where improvements in other areas may have made a control measure unnecessary.

For more information on this technical bulletin, please contact:
Ontario Ministry of the Environment and Climate Change
Standards Development Branch, Local Air Quality Section
40 St. Clair Avenue West, 7th Floor
Toronto, Ontario, Canada M4V 1M2
Telephone: 416-327-5519

REFERENCES

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APPENDIX A

Figure 2: Example of a Site Inspection Form

Fugitive Dust Site Inspection Form (Example)

Date: _____ **Time:** _____

Inspector Name: _____ **Inspector Signature:** _____

Areas Inspected (Identify road segments/storage piles/activity):

_____ Paved Roadways: ☐PR1 ☐PR2 ☐PR3 ☐PR4 ☐PR5 ☐PR6 ☐PR7 ☐PR8 ☐PR9 ☐PR10

_____ Unpaved Roadways: ☐UR1 ☐UR2 ☐UR3 ☐UR4 ☐UR5 ☐UR6 ☐UR7 ☐UR8 ☐UR9 ☐UR10

_____ Storage Piles: ☐SP1 ☐SP2 ☐SP3 ☐SP4 ☐SP5 ☐SP6 ☐SP7 ☐SP8 ☐SP9 ☐SP10

_____ Loading/Unloading: ☐LU1 ☐LU2 ☐LU3 ☐LU4 ☐LU5 ☐LU6 ☐LU7 ☐LU8 ☐LU9 ☐LU10

Weather Conditions:

Wind Direction _____ Temperature (°C) _____

Wind Speed (m/s) _____ Precipitation ☐ None ☐ Rain ☐ Snow

☐ <5 ☐ 5-10 ☐ >10

Inspection Criteria	Observations	Follow-up Action	Responsibility	Status
Is visible dust observed at the area inspected?				
Is the area well maintained (i.e. good housekeeping, spillage cleaned up)?				
Are proper control measures used (e.g. vacuum sweeper, water truck etc.)?				
Are vehicles moving below speed limit (if applicable)?				
Are appropriate load sizes maintained on haul vehicles (if applicable)?				
Are the haul vehicles regularly cleaned before leaving the site?				
Are storage pile heights maintained below the level of windbreak (if applicable)?				
Are low drop heights maintained for material handling activity?				

APPENDIX B – EXAMPLES OF BEST MANAGEMENT PRACTICES IN ONTARIO FACILITIES

Figure 3. Wetting of Storage Pile using Water Cannon

Figure 4. Immediate Clean-up of Overflow/Spills

Figure 5. Installation of Environmental Barrier

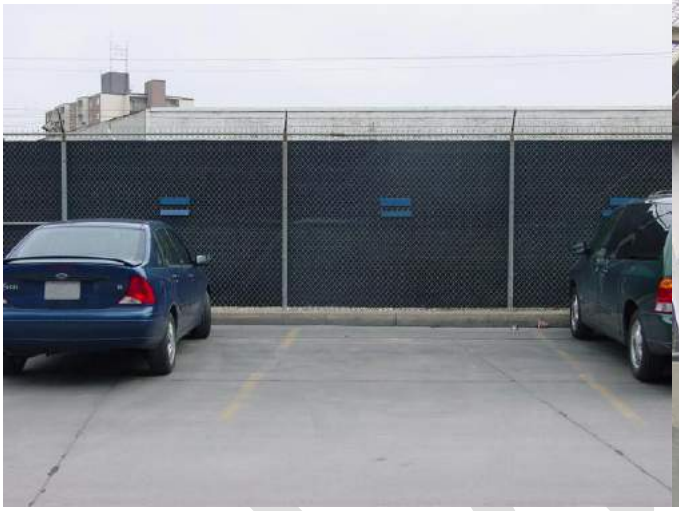

Figure 6. Wetting of Material

Figure 7. Vacuum Sweeping

Figure 8. Wind Protection for Unloading of Fine PM

Figure 9. Truck Washing

Figure 10. Well Vegetated Grounds

Figure 11. Pneumatic Loading

Figure 12. Water Truck on Unpaved Road

Figure 13. Shelter for Storage Pile

Figure 14. Barrier for Storage Piles

APPENDIX C - EXAMPLES OF IMPROVEMENT OPPORTUNITIES

Figure 15. Dry Sweeping

Figure 16. Unprotected Storage Piles

Figure 17. Large un-vegetated surfaces

Figure 18. Poor Housekeeping

Figure 19. Open Loading

Figure 20. High Drop Height

THE SPECIES AT RISK HANDBOOK FOR OTTAWA

Ottawa Stewardship Council

CONTENTS

STÉPHANE BOISVENUE

INTRODUCTION

The City of Ottawa is located in the Mixedwood Plains Ecozone of southern and eastern Ontario, near the boundary of northern Ontario's Canadian Shield Region. The area is rich in natural and man-made green spaces and is home to a vast array of species. Many of these species have been identified as Species at Risk (SAR) for reasons such as overexploitation, pollution, introduction of invasive species, climate change and/or habitat loss. Within Canada over 500 species are listed as extirpated, endangered, threatened or of special concern and the number continues to grow. Species at Risk include a variety of birds, mammals, fish, reptiles, amphibians, insects and plant life.

The federal Species at Risk Act (SARA) and Ontario's Endangered Species Act, 2007 (ESA) demonstrate Canada's and Ontario's commitment to protect species at risk and their critical habitats and to take additional steps where necessary to recover the species. Each statute listed the species as Extirpated, Endangered, Threatened or Special Concern.

Ontario's Provincial Policy Statement (2014) and the City of Ottawa's Official Plan (Section 4.7.4) prohibit development or site alteration within the habitat for endangered or threatened species and require an Environmental Impact Statement (EIS) to demonstrate that no negative impacts will occur for development or site alteration adjacent to such habitat. Species of Special Concern (SC) (which is the lowest risk category) may be protected under various existing laws (e.g., Fish and Wildlife Conservation Act, Migratory Birds Convention Act, Fisheries Act).

To increase knowledge and raise awareness about the SAR known, unconfirmed or suspected to be living within the City's boundaries and to provide a general reference to everyone interested, the Ottawa Stewardship Council (OSC) has created this illustrated Species at Risk Handbook. The Handbook provides a photo (usually donated by local residents) and a description of each species and its habitat for a selection of SAR in the City of Ottawa as currently listed under federal Species at Risk Act (SARA) and/or the Ontario Endangered Species Act (ESA), 2007.

Every form of life is unique, warranting respect regardless of its worth to man, and, to accord other organisms such recognition; man must be guided by a moral code of action. United Nations'

– World Charter for Nature (1982, p.1)

DOMINIQUE CHALIFOUX

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The Ottawa Stewardship Council could not have completed this handbook without financial and technical contributions from organizations, individuals and government.

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- The City of Ottawa .
- South Nation Conservation Authority (SNCA).
- Mississippi Valley Conservation Authority (MVCA).
- Rideau Valley Conservation Authority (RVCA).
- Ontario Ministry of Natural Resources (OMNR).
- Ottawa Field Naturalists' Club (OFNC).
- Nature Canada (NC).
- The Canadian Museum of Nature (CMN).
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DOMINIQUE CHALIFOUX

WHAT YOU CAN DO TO HELP SPECIES AT RISK (SAR):

You play an important role in the protection and recovery of SAR. Whether you own property on the water or grassy fields and hedgerows, grow crops or raise livestock, take walks through an urban woodlot, or cultivate a garden in the city, here are some things you can do:

- Learn more about SAR and report any sightings to the Ministry of Natural Resources' Kemptville District Office (Kemptville.Inforequest@ontario.ca and/or sar.kemptville@ontario.ca) and Natural Heritage Information Center: http://nhic.mnr.gov.on.ca/MNR/nhic/species/species_report.cfm).
- In Ottawa, Nature Canada's NatureHood program focuses on one of the region's most important wildlife habitats, the Lac Deschênes-Ottawa River Important Bird Area (IBA), which spans almost 300 km2 along the shores of the Ottawa River from downtown Ottawa to Fitzroy Harbour in the west. The IBA is a great place to get to know the local wildlife – including species at risk and their habitats – all year long. For more information visit www.lacdeschenes.ca
- Do not collect or relocate them.
- Be respectful, and observe from a distance.
- Report any illegal activity to the MNR: 1-877-TIPS-MNR (847-7667).
- Engage in active stewardship of SAR habitat on private property. Landowners may qualify for provincial tax incentive programs or funding for projects that benefit specific species (Contact the MNR for more information: 1-800-667-1940).
- Volunteer with your local area stewardship councils, provincial parks, nature clubs, etc;
  - For example, Bird Studies Canada is working to advance the understanding, appreciation and conservation of wild birds and their habitats. For more information on how you can help, visit: www.birdscanada.org.
  - Ottawa Bird Count is a volunteer based, scientifically Rigorous Survey of Birds in a Expanding City , see www.ottawabirds.ca for more information
- Start and/or participate in a community or school program.
- Protect our green spaces and choose native species when you plant trees and gardens.
- Properly dispose of waste and garbage.
- Invasive plants can pose a threat to some SAR and other native plants. When planting on your property, be sure to check with your local garden centre or native plant nurseries for a list of native species.
- The Ottawa area has many local groups that you can join or volunteer with, to support SAR habitat conservation. A list of just a few of them is provided below.
  - The Ottawa Field-Naturalists' Club.
  - The McNamara Field Naturalists' Club.
  - The Ottawa Riverkeeper.
  - The Ottawa Stewardship Council.
  - The RVCA's City Stream Watch program.

ACRONYMS:

- **COSEWIC:** Committee on the Status of Endangered Wildlife in Canada
- **COSSARO:** Committee on the Status of Species at Risk in Ontario
- **ESA:** Endangered Species Act (Ontario)
- **OMNR:** Ontario Ministry of Natural Resources
- **OMOE:** Ontario Ministry of Environment
- **SARA:** Species at Risk Act (Federal)


DOMINIQUE CHALIFOUX

DEFINITIONS:

SPECIES AT RISK or SAR - any plant or animal listed as endangered, threatened or of special concern, which is vulnerable to extinction or extirpation

EXTINCTION (OMNR) - no longer lives anywhere in the world (e.g. Passenger Pigeon)

EXTIRPATED (OMNR) - lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario (e.g., Eastern Tiger Salamander)

ENDANGERED (OMNR) - lives in the wild in Ontario but is facing imminent extinction or extirpation (e.g. Butternut tree, Spotted Turtle)

THREATENED (OMNR) - lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it (e.g. Bobolink, Blanding's Turtle)

SPECIAL CONCERN (OMNR) - lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats (e.g. Monarch butterfly, Peregrine Falcon)

HABITAT- areas where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter, and space needed to sustain their populations

- Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle, and areas which are important to migratory or non -migratory species

OTTAWA STEWARDSHIP COUNCIL- a volunteer, community-based Stewardship Council that works on environmental enhancement/stewardship projects

BIRDS

SPECIES

Common Name: Bald Eagle
Latin Name/Scientific Name: *Haliaeetus leucocephalus*

STATUS

Ontario ESA: Special Concern
Federal SARA: None

Description:

- The Bald Eagle is a very large bird of prey with a wingspan of just over two meters.
- Adult Bald Eagles are easy to identify, with a bright white head, neck and tail, and a dark brown body.
- Their eyes are pale yellow, and their beak, feet and legs are bright yellow.
- Young eagles are mostly brown, with patchy white spots. Their eyes and beak are dark brown. Bald Eagles take about five years to develop adult coloration.

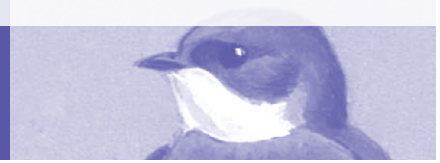
Habitat:

- Nests in a variety of forests and habitats, preferably near a lake or river for hunting. Typically nest in large trees (e.g., mature pine or poplar).
- During the winter, Bald Eagles sometimes congregate near areas of open water, or in places where large numbers of carcasses might be found.

What you can do:

- Do not disturb eagles when they are feeding or nesting.
- Do not disrupt their habitat.

BIRDS



SPECIES

Common Name: Bank Swallow
Latin Name/Scientific Name: *Chlidonias niger*

STATUS

Ontario ESA: Threatened
Federal SARA: None

Description:

- Approximately 12 cm long and weighs 10 to 18 grams (our smallest swallow).
- Males and females are similar in colour and size.
- Brown with a white front, except for the brown band running across the chest.
- Long wings, which reach down to the tip of the tail (when folded).
- Their feet and legs are gray and their bills are black, short and curved.
- Variety of calls including a “tchirrt tchirrit” accompanied with a long twittering.
- Eat a variety of flying insects, with their main food source consisting of dragonflies, flies, mayflies and beetles.
- In flight the swallow moves quickly, with erratic wing beats and constant vocalizations.

Habitat:

- Nest colonially in burrows in naturally or artificially exposed vertical faces of silt and sand deposits (e.g., riverbanks, bluffs, sand or gravel pits).
- Fledglings move with their parents to communal roosts, usually on telephone and hydro lines, which may be quite far from their nesting site.
- Colonies may consist of several to a few thousand pairs.
- In the winter they migrate south, usually to South America.

What you can do:

- Be mindful of possible locations of their nests and do not disturb them.

BIRDS

SPECIES

Common Name: Barn Swallow
Latin Name/Scientific Name: *Hirundo rustica*

STATUS

Ontario ESA: Threatened
Federal SARA: None

Description:
- Medium-sized songbird that is about 15-18 cm long.
- Males have a glossy dark blue back and upper wings, a rusty-red forehead and throat and a tawny belly. They have long tail feathers that form a distinctive, deep fork and a line of white spots across the outer end of the upper tail.
- The female's tail feathers are slightly shorter and her underside is a paler buff colour.
- Young swallows look similar to the adult female, but have much shorter tail feathers and yellow lower bills.

Habitat:
- Nests in barns, under bridges and in culverts.
- Forages widely in adjacent open areas and over water.
- Builds cup-shaped mud nests.

What you can do:
- If you have a barn on your property, leave a way for Barn Swallows to enter the building.
- You can also provide a source of mud nearby for nest-building.

BIRDS

SPECIES

Common Name: Black Tern
Latin Name/Scientific Name: *Chlidonias niger*

STATUS

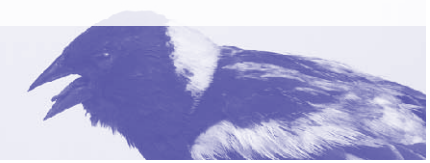
Ontario ESA: Special Concern
Federal SARA: None

Description:
- Small, graceful water bird approximately 20-26 cm long (slightly smaller than a Robin).
- Black head and under parts during the breeding season.
- Forked tail and long, narrow grey wings.
- Straight, pointed bill.

Habitat:
- Builds floating nests in shallow marshes, especially in cattails. Usually nests in groups (colonies) and forages as part of a flock.
- Migrates to the coast of northern South America in the winter.

What you can do:
- Conserve wetland habitat.
- Avoid disturbing nesting colonies.
- When boating or using powered watercraft, treat nesting colonies as “no-wake” zones to avoid swamping the floating nests.

BIRDS



SPECIES

Common Name: Bobolink
Latin Name/Scientific Name: *Dolichonyx oryzivorus*

STATUS

Ontario ESA: Threatened
Federal SARA: None

Description:
- Medium-sized songbird that may reach 20 cm in length.
- In the spring and summer, male Bobolinks are black with a white back and yellow head. By late summer, males lose their conspicuous breeding colours, changing to resemble the female's tan with black stripes.
- Bubbling, musical song.

Habitat:
- Bobolinks usually nest on the ground in dense, tall grasses.
- They prefer native prairies, savannahs, hayfields, and grasslands but may also be found in weedy meadows or overgrown fields.

What you can do:
- Do not disturb or harass them and do not mow/disturb fields during nesting season (early May-end of July).

BIRDS

SPECIES

Common Name: Canada Warbler
Latin Name/Scientific Name: *Cardellina canadensis*

STATUS

Ontario ESA: Special Concern
Federal SARA: Threatened

Description:

- Small songbird about 12-15 cm long.
- Blue-grey upper body with yellow on the throat, chest and belly. Black forehead and "sideburns" joining into a necklace across the chest.
- Males are more brightly coloured than females.
- Males sing a distinctive song of clear, liquid notes ending emphatically.

Habitat:

- Breeds in deciduous and coniferous forests.
- Prefers wet forests with a dense shrub layer.
- Nests are built on or near the ground.

What you can do:

- Conserve forests and surrounding natural vegetation on your property.

BIRDS

SPECIES

Common Name: Cerulean Warbler
Latin Name/Scientific Name: *Setophaga cerulea*

STATUS

Ontario ESA: Threatened
Federal SARA: Special Concern

Description:

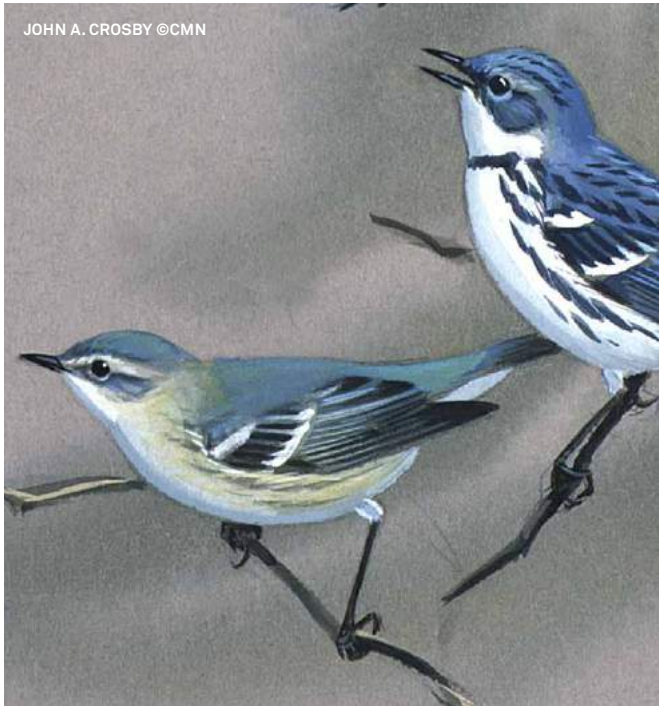
- Small songbird that is approximately 10-12 cm long.
- Males are blue above, with black markings on their wings and back, and white underneath with a dark band across their throat and blue striping along their sides.
- Females are greenish-blue above and white underneath.
- Males and females both have two broad white wing bars and white tail spots.

Habitat:

- Prefers large, mature, deciduous forests with open understoreys.
- Overwinters in the Andes Mountains of South America.

What you can do:

- Conserve large areas of mature deciduous forests, with tall trees for nesting.



BIRDS

SPECIES

Common Name: Chimney Swift
Latin Name/Scientific Name: *Chaetura pelagica*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

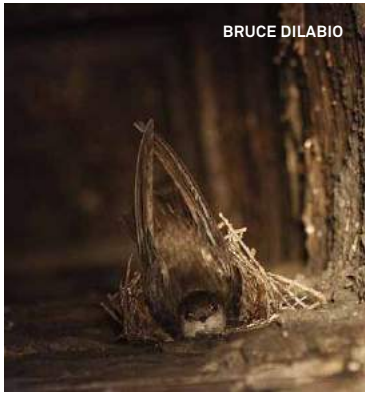
- Small, swallow-like bird approximately 12-14 cm long with a “cigar” shaped body and long, slender curved wings.
- Dull greyish-brown with a pale throat.
- Recognized by its high-pitched twittering and chipping call and erratic flight pattern.

Habitat:

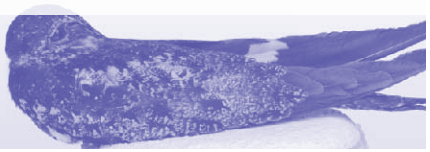
- Nests and roosts in chimneys and other man-made structures (historically, in caves and tree cavities).
- Tends to stay close to water bodies for foraging.

What you can do:

- Don’t cap or demolish chimneys that could provide habitat.
- Do not alter or disturb nesting sites, such as a cavity tree or chimney, during the breeding season (have your chimney’s annual maintenance done during the early spring or fall, when the birds are not using it).
- Join volunteer groups to monitor their locations.
- Review the OSC’s website for the Chimney Swift Monitoring and Outreach Report.



BIRDS



SPECIES

Common Name: Common Nighthawk
Latin Name/Scientific Name: *Chordeiles minor*

STATUS

Ontario ESA: Special Concern
Federal SARA: Threatened

Description:

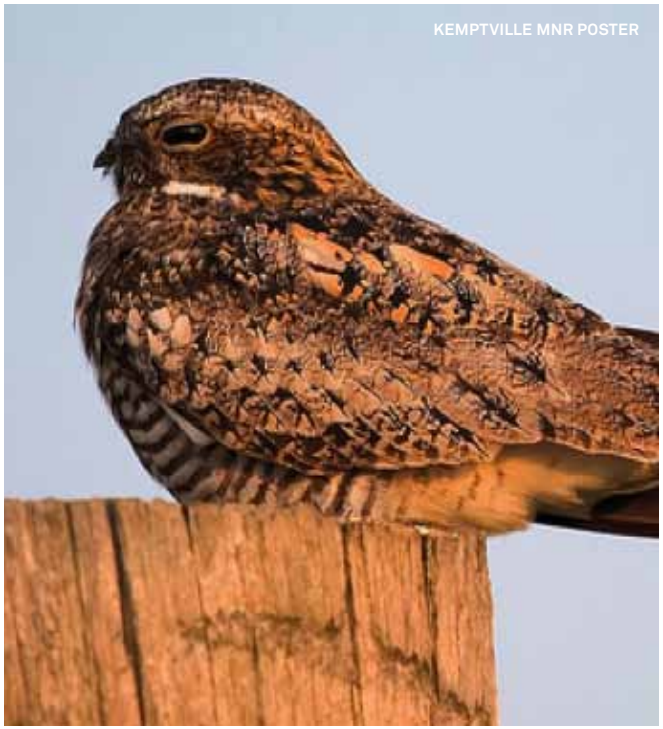
- Medium-sized bird, approximately 25 cm long.
- Large head and eyes with long, narrow, pointed wings and a long tail.
- Dark brown with numerous black, white and buff specks, which let it blend in with its surroundings while roosting on the ground.
- A broad white stripe can be seen near each wingtip during flight.
- Females have a buff-coloured throat, while males have a white throat.
- Usually seen flying during the evenings or early mornings, swooping overhead to catch insects.
- Call is a sharp “peent, peent”.

Habitat:

- Does not build a nest, just lays eggs on the ground.
- Prefers open areas with little or no ground vegetation, such as rocky outcrops, recently cleared or burned-over woodlands, forest clearings, peat bogs, or lake shores.
- Can also be found on gravel rooftops, in cultivated fields or orchards, or along gravel roads and rail corridors.

What you can do:

- Watch out for nests on the ground (or roof).
- Do not disturb them if found.



BIRDS

SPECIES

Common Name: Eastern Meadowlark
Latin Name/Scientific Name: *Sturnella magna*

STATUS

Ontario ESA: Threatened
Federal SARA: None

Description:

- Medium-sized songbird that is approximately 22-28 cm in length.
- Bright yellow on the throat and belly with a black “V” on its chest.
- The flanks are white and the backs are brown with black streaks.
- Their song consists of a series of two to eight clear whistles, often slurred, that descend in pitch.

Habitat:

- Prefer to nest in moderately tall grasslands (pastures and hayfields) but also found in alfalfa fields, croplands, roadsides, orchards, airports and overgrown fields.
- Uses small trees, shrubs or fence posts as perches for singing.
- Nests are built on the ground and well-camouflaged with a roof woven from grasses.

What you can do:

- Do not disturb or harass them and do not mow/disturb fields during nesting season (early May to mid-August).

BIRDS

SPECIES

Common Name: Eastern Whip-poor-will
Latin Name/Scientific Name: *Caprimulgus vociferus/Antrostomus vociferus*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

- Approximately 22-26 cm long.
- Large, broad head with big black eyes.
- Blotchy brown and grey all over.
- As a nocturnal species, it is more commonly heard than seen.
- They are most vocal during bright, moonlit nights, repeatedly calling their name, "Whip-poor-will".

Habitat:

- Prefers a mixture of forests and open land (savannahs, open woodlands, or mature forests of any type with open areas).
- Roosts in the forest during the day and forages in open areas at night.
- Lays its eggs on the ground in the forest.

What you can do:

- Watch out for nests on the ground.
- Do not disturb them if found.

BIRDS

SPECIES

Common Name: Eastern Wood-Pewee
Latin Name/Scientific Name: *Contopus virens*

STATUS

Ontario ESA: Special Concern
Federal SARA: None

Description:

- Small, inconspicuous songbird approximately 15 cm long.
- Olive-grey overall with whitish throat and belly and the head is slightly crested.
- Dark wings with two thin white bars (young birds have buff wingbars).
- Bill is black on top and yellow underneath; feet and legs are black.
- Males and females are similar in colour and size.
- Sing regularly throughout the day and sometimes at night. Song is composed of three slurred notes and is usually recorded as “pee-ah-wee”.
- They are flycatchers, flitting out repeatedly from perches to catch and eat flies, beetles, bees, ants and other flying insects.

Habitat:

- Live and forage in the mid-canopy layer of deciduous or mixed forests, and are usually found around clearings and edges.
- Preferred hunting perches are usually dead branches in the mid-canopy.
- Typically nest in forest edges (near clearings, roadways, etc.) on horizontal tree branches, usually in deciduous trees. Nests are placed far from the trunk and approximately 5 to 20 meters from the ground.

What you can do:

- Join the Ottawa Bird Count so you can learn to identify their easily recognizable song and help monitor bird populations in the city (www.ottawabirds.ca).

BIRDS

SPECIES

Common Name: Golden-winged Warbler
Latin Name/Scientific Name: *Vermivora chrysoptera*

STATUS

Ontario ESA: Special Concern
Federal SARA: Threatened

Description:

- Small songbird that is approximately 11 cm long.
- Grey above with white undersides, bright yellow wing patches and forehead.
- Males have a black throat and black eye mask; females have the same markings in grey.

Habitat:

- Prefers to nest in shrubby areas surrounded by mature forests (e.g., forest edges, or recently disturbed or logged areas).
- Nests are often built on the ground.

What you can do:

- Do not disturb nests.

BIRDS

SPECIES

Common Name: Henslow's Sparrow
Latin Name/Scientific Name: *Ammodramus henslowii*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- Small, inconspicuous songbird, approximately 11-13 cm long.
- Chestnut brown wings, olive-green head and neck, and brown back, with black streaks over much of its body.
- They are most often heard rather than seen and make an insect-like "tsi-lik" sound.

Habitat:

- Found in open fields with tall grass and scattered shrubs (e.g., prairies, abandoned farm fields, wet meadows).
- Prefers tall, dense grasses to cover its ground nest.

What you can do:

- Help maintain grasslands to provide a healthy habitat.

BIRDS

SPECIES

Common Name: Least Bittern
Latin Name/Scientific Name: *Ixobrychus exilis*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

- Very small heron approximately 30 cm in length.
- Mainly warm brown and beige, with dark chestnut patches on the wings, a tan and white streaked throat and a white belly.
- Yellow beak, legs and feet.
- Males have a black crown and back.
- Makes a chuckling “coo-coo-coo” noise.

Habitat:

- Prefers cattail marshes with a mixture of open pools and channels, but can sometimes be found in other wetland habitats.
- Nests above the water in thick vegetation.

What you can do:

- Conserve wetland habitat.
- Help control non-native wetland plants.
- Do not disturb areas where least bitterns may live, especially in May to mid-July (they are very shy and nesting could be disrupted).
- Participate in one of Bird Studies Canada’s Marsh Monitoring Programs (volunteer@birdscanada.org, www.birdscanada.org).

BIRDS

SPECIES

Common Name: Peregrine Falcon
Latin Name/Scientific Name: *Falco peregrinus* (Subspecies: *anatum*)

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- Large falcon, approximately 36-49 cm long (crow-sized) with long pointed wings that can span a metre or more.
- Females are larger than males.
- Adults have a dark head and blue-grey back, with a cream-coloured chest covered in small dark bars.
- Juveniles are brownish-grey above, without the dark head, and their underparts are heavily streaked rather than barred.
- Adults and juveniles both have a prominent dark “moustache”.
- Bright yellow legs and feet, with sharp talons.

Habitat:

- Nests on cliffs near large bodies of water. In urban areas, uses tall buildings or other structures instead of cliffs.

What you can do:

- Join a volunteer watch group or report any sightings to help keep track of their locations.
- Avoid using pesticides to control pigeons, as pesticides may harm nearby Peregrine Falcons.

BIRDS

SPECIES

Common Name: Short-eared Owl
Latin Name/Scientific Name: *Asio flammeus*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- Medium-sized owl approximately 34-42 cm long, with long wings and a short tail.
- Large round head, with small tufts of feathers that resemble ears.
- Adults have a mottled brown back and pale chest with brown streaks. Females are slightly larger than males and tend to be darker.
- Most often seen at dusk or dawn, flying in an irregular pattern over open grasslands or marshes with deep wing beats, hovering and skimming the ground.

Habitat:

- Found in open areas such as marshes and grasslands.
- Nests on the ground.

What you can do:

- Conserve open habitats.
- Do not disturb the birds, especially while feeding or nesting.

BIRDS

SPECIES

Common Name: Wood Thrush
Latin Name/Scientific Name: *Hylocichla mustelina*

STATUS

Ontario ESA: Special Concern
Federal SARA: None

Description:

- Medium sized songbird, approximately 20 cm long.
- Rich rusty-brown colour on the head fades to brown on the back, wings and tail.
- Underside white with numerous large dark spots on the breast and sides. Bright white eye-ring.
- Feet and legs are pink or greyish-pink.
- Adults and young look similar, although the young have streaks and spots on their back, neck and wings.
- Song consists of a varied series of clear flute-like phrases, “ee oh lee ee oh lay”.
- Feeds on insects and other invertebrates foraged on the ground or in trees and some fruits.
- Males usually feed young while females start a second nest, allowing pairs to raise more than one brood per year.

Habitat:

- Live in mature deciduous and mixed forests, preferring moist stands of trees that have both well-developed undergrowth and tall trees with perches for singing.
- Usually found in large forests, although they will use smaller ones as well. Smaller forest patches present a greater risk of predation or nest parasitism by brown-headed cowbirds.
- In the winter they fly south to Mexico or Central America.

What you can do:

- Conserve areas of mature forest habitat, especially large unfragmented areas.
- Join the Ottawa Bird Count so you can learn to identify their easily recognizable song and help monitor bird populations in the city (www.ottawabirds.ca).

SPECIES

Common Name: Yellow Rail
Latin Name/Scientific Name: *Coturnicops noveboracensis*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- Small marsh bird that is approximately 13-18 cm long.
- Short yellow or blackish bill and short tail.
- Buff-yellow chest and face, with a dark crown and dark stripes through its eyes. Bold dark streaks on its yellowish back and white wing patches distinguish it from other rails.
- In the breeding season, the males make characteristic clicking sounds at night, that sound like two rocks tapping together.

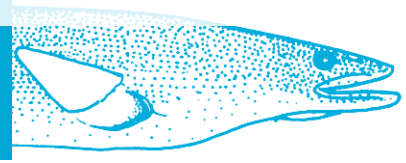
Habitat:

- Large, shallow wetlands, usually marshes with abundant reeds and sedges.
- Nests on the ground, using existing mats of dried vegetation as cover.

What you can do:

- Conserve shallow marsh habitat.
- Help control non-native wetland plants.
- Participate in one of Bird Studies Canada's Marsh Monitoring Programs (volunteer@birdscanada.org, www.birdscanada.org).

FISH



SPECIES

Common Name: American Eel
Latin Name/Scientific Name: *Anguilla rostrata*

STATUS

Ontario ESA: Endangered
Federal SARA: None

Description:

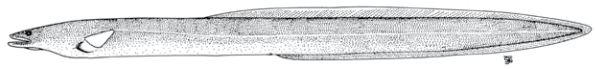
- Adult females may reach over a meter in length while males reach less than 40 centimeters.
- Long, snake-like body and fins that extend along its back, around the tail and along its underside.
- Thick lips with a lower jaw that is slightly longer than its upper jaw, making it look like it has an under bite.
- Juveniles are yellowish-green or brown.
- Adults are grey with a white or cream belly.

Habitat:

- Can be found in both salt and fresh water.
- Some scientists consider the American Eel to have the broadest diversity of habitats of any fish species in the world.

What you can do:

- Keep lakes and rivers clean.
- Volunteer with a local nature club or provincial park to participate in surveys or stewardship work focused on species at risk.
- Release unharmed if caught while fishing, and report sighting to MNR



SALLY GAN©CMN

FISH

SPECIES

Common Name: Channel Darter
Latin Name/Scientific Name: *Percina copelandi*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

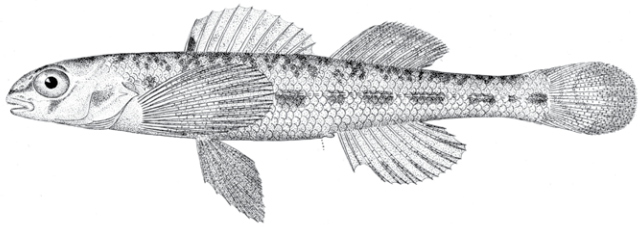
- Small member of the perch family.
- Typically grows between 3-7 cm in length.
- Light sand or olive colour body, with brown markings on its back with dark cross- shaped markings or oblong blotches on its sides and a whitish belly.
- Fins are usually clear, but can also be lightly speckled.
- It looks similar to other darter species, (e.g. Johnny Darter), experts can tell these two fish species apart by looking at the small spines on the anal fin near the tail.

Habitat:

- Lives in clean streams and lakes with sandy or gravel bottoms.
- During the breeding season in late spring, it prefers riffle areas with fairly fast moving water but spends the winter in deeper, calmer water.
- It eats mostly aquatic insect larvae from the bottom of the stream.

What you can do:

- The main threat is poor habitat quality, so you can help by aiding in maintaining a healthy vegetation buffer between the shore and the creeks, rivers and lakes.
- Don't use pesticides near watercourses.



JOHN L. TOTTENHAM ©CMN

SPECIES

Common Name: Lake Sturgeon
Latin Name/Scientific Name: *Acipenser fulvescens*

STATUS

Ontario ESA: Threatened
Federal SARA: None

KEMPTVILLE MNR POSTER

THREATENED

Description:

- Canada's largest freshwater fish, weighing up to 180 kg (approximately 400 lbs) and reaching over two meters long.
- Extended snout with four whisker-like organs hanging near the mouth.
- The body is covered with large bony plates.
- Dark to light brown or grey colour on its back and sides, with a lighter belly.
- Has a skeleton made up of cartilage instead of bones.
- Have ancestral ties to related species dating back 200 million years. It can live more than 100 years.

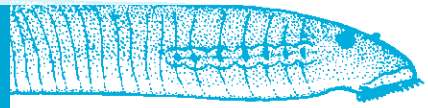
JOHN L. TOTTENHAM ©CMN

Habitat:

- Lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel.
- Found at depths of five to 20 meters.
- Spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom, in deeper water where habitat is available and/or in open shoals in large rivers with strong currents.

What you can do:

- Keep lakes and rivers clean.
- Read the MNR Report ***A synoptic review of the history and our knowledge of lake sturgeon on the Ottawa River*** which is available on the Ottawa Riverkeeper web site http://ottawariverkeeper.ca/river/sturgeon_species_at_risk/
- Contact your local Ministry of Natural Resources office to find out how you can become involved in hands-on fish and wildlife management activities.



SPECIES

Common Name: Northern Brook Lamprey
Latin Name/Scientific Name: *Ichthyomyzon fossor*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- Small fish with an eel-like appearance that can grow up to 16 cm long.
- Features of a lamprey include a round, jawless mouth with teeth in a circle, seven gill openings and no pectoral or pelvic fins.
- Adults are dark greyish-brown on the back and sides, with pale grey or silvery white on the belly.
- They have two stages of development – larval and adult.
- It is very difficult to distinguish this species from the other native lamprey. Biologists rely on its small size, continuous dorsal fin, and the teeth.

Habitat:

- Prefers clear/cool water streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream.
- Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel.
- Spawning occurs in May and June.
- Requires silt or sand water bottoms during the larval stage.
- Prefers riffles with rock or gravel during adulthood.

What you can do:

- Maintain a healthy vegetation buffer between the shore and the creeks, rivers and lakes, by planting trees and shrubs and allowing grasses to grow to prevent soil erosion and filter stormwater and pollutants.

SUSAN LAURIE BOURQUE ©CMN

FISH

SPECIES

Common Name: River Redhorse
Latin Name/Scientific Name: *Moxostoma carinatum*

STATUS

Ontario ESA: Special Concern
Federal SARA: None

Description:

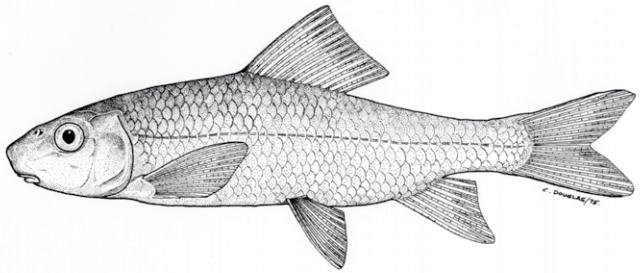
- Can grow up to 80 centimeters and weigh more than 5.5 kg (12 lbs).Large, thick-bodied sucker with a large, flat-topped head, a prominent snout and a red-tinted tail fin.
- The belly is white, the back is brown or olive green and has brassy, yellowish-green or coppery sides

Habitat:

- Lives in medium to large rivers with a strong flow.
- In May and June, adults migrate from deeper, slower moving pools and run habitats to shallow riffle-run habitats having coarse substrate and moderate to swift flow.
- Requires clear and unpolluted water and is therefore susceptible to siltation and turbidity that can result from farming and urban development.

What you can do:

- Support the development of passageways for migrating fish at dams and other man made obstructions.



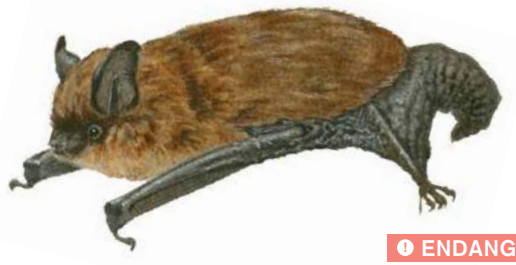
CHARLES DOUGLAS ©CMN

MAMMALS

SPECIES

Common Name: Eastern Small-Footed Bat
Latin Name/Scientific Name: *Myotis leibii*

PAUL GERAGHTY ©CMN



ENDANGERED

STATUS

Ontario ESA: Endangered
Federal SARA: None

Description:

- Approximately 7-8 cm long and weighs from 3-8 grams, about as much as a Canadian nickel.
- Wingspan approximately 21 to 25 cm.
- Glossy yellowish brown to grey or even coppery brown fur.
- Underside is whitish or a pale yellow-brown colour.
- From one ear to the other there is a dark brown or black “Mask” and the wings and ears are black.
- They have small-feet and that are about 6-8 mm in length.
- The males and females look similar in size and colour.
- They live to about 6 up to 12 years old in the wild.
- They mostly eat small flying insects.
- The have one young for each females from June to July in small nursery colonies.

Habitat:

- They prefer hilly regions with deciduous and/or evergreen forests, sometimes they will be found in open farmland and grassy areas.
- During the spring and summer they are known to change their roosting location every day and they consist of rock outcrops and ledges, under bridges, sometimes in or under the eaves of buildings, caves, mines and/or hollow trees.
- They hibernate in winter either alone in cracks and crevices or in a group in caves and mines, which are usually in drier and colder conditions when compared to other bat species.
- The nursery colonies can occur in bank crevices, under bridges or shingles on buildings.

What you can do:

- Consider installing a bat box on your property to provide roosting habitat for bats. For more information on building and installing a bat box, check out the Ottawa Stewardships Website for information on Bat Boxes from the Toronto Zoo Bat Box Program, Canadian Wildlife Federation and Bat Conservation International http://www.ottawastewardship.org/landowner-resources/

MAMMALS

SPECIES

Common Name: Little Brown Bat (Myotis)
Latin Name/Scientific Name: *Myotis lucifugus*

STATUS

Ontario ESA: Endangered
Federal SARA: None

PAUL GERAGHTY ©CMN

ENDANGERED

Description:

- Approximately 4-5 cm long and from 4 to 11 grams in weight.
- Wingspan approximately 22 to 27 cm.
- Brown in colour.
- Look similar to many other bats, especially northern long-eared bats (which are also endangered).
- Scientists distinguish between them using their calls, or by the fleshy projection that covers the entrance to the ear, which in little brown bats is long and thin, but rounded at the tip.
- Eat insects and feed at night, usually most active in the two to three hours after sunset.
- Females usually gives birth to only one young, which is able to fly and obtain its own food when just three weeks old.

Habitat:

- During the day they roost in trees and buildings.
- They often select attics, abandoned buildings and barns for summer colonies where they can raise their young.
- They can squeeze through very tiny spaces and this is how they access many roosting areas.
- Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing.

What you can do:

- Stay out of caves and abandoned mines where bats may live, so you don't disturb them or contribute to the spread of white nose syndrome, a potentially deadly fungal infection believed to have been inadvertently introduced to North America from Europe. The fungus grows in humid cold environments, including in caves and mines. The syndrome disrupts the bats' hibernation cycle, making it harder for them to survive the winter.

KEMPTVILLE MNR POSTER

LESLEY HALE

MAMMALS

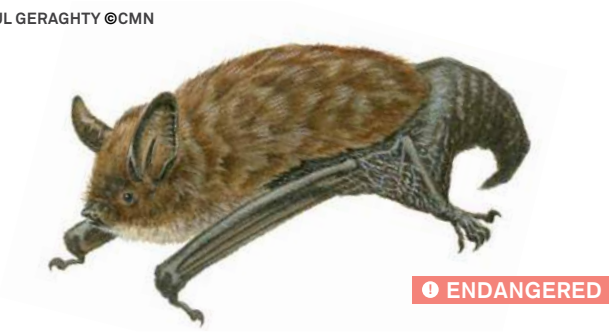
SPECIES

Common Name: Northern Myotis/Northern Long-eared Bat
Latin Name/Scientific Name: *Myotis septentrionalis*

STATUS

Ontario ESA: Endangered
Federal SARA: None

PAUL GERAGHTY ©CMN



ENDANGERED

Description:

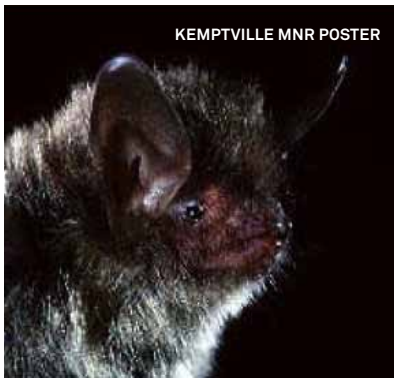
- Dull yellow-brown fur with pale grey bellies.
- Typically 8 centimeters long, with a wingspan of about 25 centimeters.
- Usually weigh between 6 and 9 grams.
- They have long (rounded) ears.
- Look similar to other bats, especially little brown bats.
- Scientists distinguish between them using their calls, or by the fleshy projection that covers the entrance to the ear, which in the northern long-eared bat is long and thin, with a pointed tip.
- Females usually give birth to one young, which is able to fly and obtain its own food when just a month old.

Habitat:

- Associated with boreal forests, roosting under loose bark and in the cavities of trees
- Hibernate from October or November until March or April, usually in caves or abandoned mines

What you can do:

- Please report any unusual bat behaviour or deaths to the Canadian Cooperative Wildlife Health Centre at 1-866-673-4781 or the Natural Resources Information Centre at 1-800-667-1940.



KEMPTVILLE MNR POSTER

LESLEY HALE

REPTILES

SPECIES

Common Name: Blanding's Turtle
Latin Name/Scientific Name: *Emydoidea blandingii*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

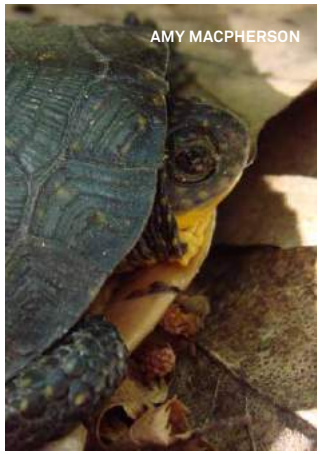
- Medium-sized turtle easily identified by its bright yellow throat and chin.
- Unlike most Ontario turtles that have wide, flatter shells, the Blanding's Turtle has a domed shell that resembles an army helmet.
- Its shell is black to brown with yellow flecks and streaks and can reach 27 centimeters long
- The head and limbs are black-grey and the bottom shell is rich yellow.

Habitat:

- Live in shallow water, usually in large wetlands and shallow lakes with lots of water plants.
- It is not unusual, to find them hundreds of meters from the nearest water body, especially while they are searching for a mate or traveling to a nesting site, which is usually contains gravel or cobble.
- Hibernate in the mud at the bottom of permanent water bodies from late October until the end of April.

What you can do:

- Watch out for turtles crossing roads during the active season (May through October).
- Maintain and protect wetlands.
- Never buy native species of turtles or any turtles that have been caught in the wild.
- If you see native species of turtles for sale in a pet store or food market, please contact the Ministry of Natural Resources.



REPTILES

SPECIES

Common Name: Eastern Musk Turtle (Stinkpot)
Latin Name/Scientific Name: *Sternotherus odoratus*

STATUS

Ontario ESA: Special Concern
Federal SARA: Threatened

Description:

- A small freshwater turtle named for the musky, skunk-like odour it produces when disturbed.
- Its narrow, highly arched shell, less than 13 centimeters long, easily distinguishes this species from most other Ontario turtles that have wide, flatter shells.
- The Eastern Musk Turtle has a dull black-brown body except for two distinctive yellow stripes often found on the side of the head.

Habitat:

- Found in ponds, lakes, marshes and rivers that are generally slow-moving with abundant emergent vegetation and muddy bottoms that they burrow into for winter hibernation.
- Nesting habitat is variable, but it must be close to the water and exposed to direct sunlight.
- Nesting females dig shallow excavations in soil, decaying vegetation and rotting wood or lay eggs in muskrat lodges, on the open ground or in rock crevices.

What you can do:

- Maintain a buffer of natural shoreline vegetation and do not disturb aquatic vegetation (Old muskrat lodges, in particular, can be popular Eastern Musk Turtle nesting areas).
- Be careful when boating in areas where Eastern Musk Turtles live, since they often bask in shallow water and can be easily hit by boats coming in to shore.

REPTILES

SPECIES

Common Name: Eastern Ribbonsnake
Latin Name/Scientific Name: *Thamnophis sauritus*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- A slender snake with three bright yellow stripes running down its back and sides, contrasting sharply with its black back.
- White chin, whitish-yellow belly and a distinct white crescent in front of each eye that can be used to distinguish it from a garter snake.
- Adults grow to about 70 centimeters long, and females are typically larger than males.
- Active during the day and feed primarily on amphibians, particularly frogs.
- Females give birth of between five and 12 live young in late summer.
- Newly born snakes are independent and begin hunting for insects to eat almost immediately.

Habitat:

- Found close to water, especially in marshes, where it hunts for frogs and small fish.
- A good swimmer, it will dive in shallow water especially when fleeing from a potential predator.
- At the onset of cold weather, these snakes congregate in underground burrows or rock crevices to hibernate together.

What you can do:

- Watch for snakes that may be crossing roads between May and October.
- Road mortality is a serious threat to snakes because they are slow moving, hard to see on the road and are sometimes intentionally run over
- If it is safe to do so, help snakes across the road in the direction they were headed.

REPTILES

SPECIES

Common Name: Milksnake
Latin Name/Scientific Name: *Lampropeltis triangulum*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

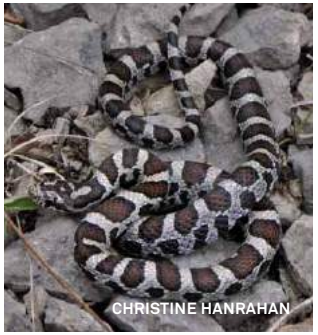
- Can grow to be one meter or more, although most are smaller.
- Its distinctive dorsal blotches are usually red with black borders.
- The belly has a black and white checkerboard pattern.
- When startled they raise their head and shake their tail, but are not venomous.
- It may also attempt to bite in defence, but only if it is attacked or picked up.
- It captures its prey, usually mice and small ground-nesting birds, with its mouth, and subdues them by constriction.
- It hunts for prey at night and remains hidden away in the daytime.
- Breeds in the spring.
- Females lay from three to 24 eggs, often in rotting logs, stumps or the burrows of small mammals.
- Eggs hatch in seven to 10 weeks, and the snakes mature in three to four years.

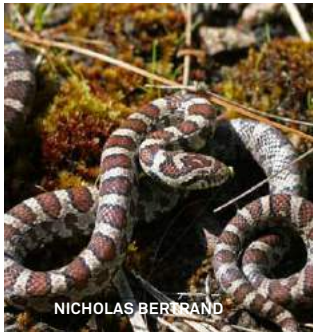
Habitat:

- Found in a range of habitats including rocky outcrops, fields and forest edges.
- Hibernates underground, in rotting logs or in the foundations of old buildings.

What you can do:

- Don't harm, harass or try to capture snakes.
- Watch out for snakes that may be basking on or crossing roads.
- Never buy snakes that have been caught in the wild and never buy a native species of any kind that's being sold as a pet.





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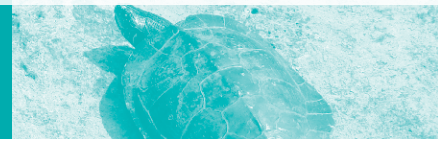


SPECIES

Common Name: Northern Map Turtle
Latin Name/Scientific Name: *Graptemys geographica*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

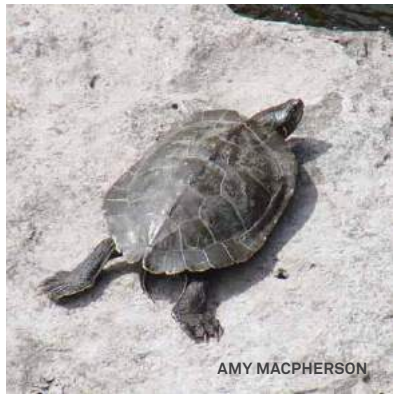
- Its name is from the lines on the upper shell (carapace) that resemble contour lines on a map.
- The lines on the carapace are shades of yellow, tan, or orange and are surrounded by dark borders and the rest of the carapace is olive green or greyish brown.
- The lower shell (plastron) is light yellow to cream.
- Yellow spot located behind the eyes, and both the head and legs, have an intricate pattern of bright yellow lines.
- Females can grow to about twice the size of males in length and may exceed 25 centimeters versus an average of only 14 centimeters for males.
- Females eat molluscs including clams and snails as well as crayfish and some fish.
- Males and young map turtles eat mainly insects and crayfish.
- Female may take more than 10 years to reach maturity.
- They nest from June through July and lay a single clutch of 10 to 17 eggs per year.
- Eggs hatch in the fall and sometimes the hatchlings overwinter in the nest.

Habitat:

- Rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer.
- In winter, the turtles hibernate on the bottom of deep, slow-moving sections of river.
- They require high-quality water that supports the female's mollusc prey.
- Habitat must contain suitable basking sites, such as rocks and deadheads, with an unobstructed view from which a turtle can drop immediately into the water if startled.

What you can do:

- Protect wetlands and large ponds, streams and rivers that don't freeze solid in the winter.
- Visit the Ontario Nature Ontario Reptile and Amphibian Atlas (www.ontarionature.org/atlas) or Toronto Zoo Adopt-a-Pond website (www.torontozoo.com/Adoptapond) to learn more about Ontario's rare turtles, their habitat and related conservation initiatives.
- Register with the Herpetofaunal Atlas, a program to improve our knowledge of Ontario's reptiles and amphibians, to receive e-mail newsletters, event notifications, and other updates.



REPTILES

SPECIES

Common Name: Snapping Turtle
Latin Name/Scientific Name: *Chelydra serpentina*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- Canada's largest freshwater turtle, reaching an average length of 20 - 36 centimeters and a weight of 4.5 - 16.0 kilograms (approximately 10 to 35 lbs).
- Large black, olive or brown shells typically covered in algae.
- Their tails, which can be longer than their bodies, have "dinosaur-like" triangular crests along their length.
- Hatchlings are about the size of a Loonie and are smaller and darker than adults, with pronounced ridges along the length of their shell.

Habitat:

- Spend most of their lives in water.
- Prefer shallow waters so they can hide under the soft mud and leaf litter with only their noses exposed to the surface to breathe.
- During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams.
- Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.

What you can do:

- Watch out for turtles on the roads, especially between May and October.
- Don't personally consume the turtles.

REPTILES

SPECIES

Common Name: Spiny Softshell
Latin Name/Scientific Name: *Apalone spinifera*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

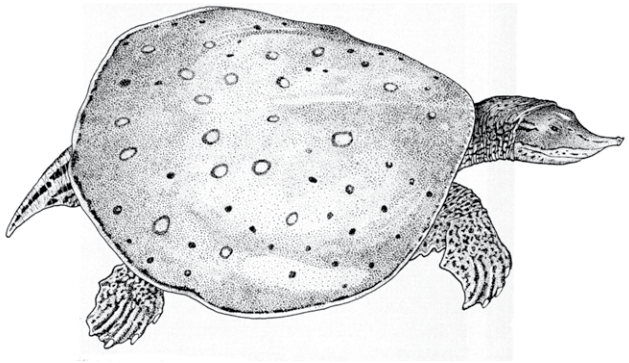
- Medium to large freshwater turtle that is easily recognized by its shell, which is round, rather flat, leathery and can reach up to 54 centimeters long.
- Distinguished by its snorkel-like snout.
- Spiny Softshell are the only turtles in Ontario with a soft shell.
- The shell is olive or tan in colour with dark blotches and tiny spine projections along the front edge.
- The body is usually olive, brown or grey in colour.

Habitat:

- Highly aquatic turtles that rarely travel far from water.
- They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers.
- Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species.
- Habitat features may be distributed over an extensive area, as long as the intervening habitat doesn't prevent the turtles from traveling between them.

What you can do:

- Keep watch for swimming turtles when boating. Because they capture food by hiding in the mud of shallow waters, they are at risk of colliding with boats coming in to shore. They often travel across the middle of lakes or bays.



CHARLES DOUGLAS ©CMN

REPTILES

SPECIES

Common Name: Spotted Turtle
Latin Name/Scientific Name: *Clemmys guttata*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- One of Ontario's smallest turtles with a shell that is rarely more than 13 centimeters long.
- It is easily recognized by its smooth black shell, which is spattered with bright yellow-orange spots.
- The head and limbs are also black with yellow-orange markings.
- These turtles eat aquatic insects, crustaceans and worms.

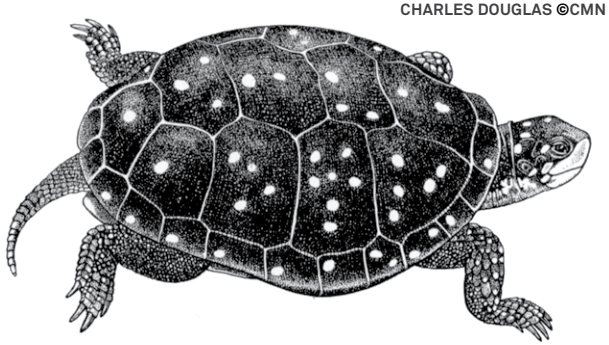
Habitat:

- Semi-aquatic, preferring ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation.
- They are found in different types of wetlands throughout the province.
- Females dig their nests in sunny locations where there is not a lot of woody vegetation.
- This species usually hibernates in wetlands or seasonally wet areas associated with structures including overhanging banks, hummocks, tree roots, or aquatic animal burrows.

What you can do:

- Don't disturb nesting sites. They return to use the same nesting and hibernation sites over several years. These areas can be crucial for survival of the local population.
- If you find a Spotted Turtle or nest on your property, you may be eligible for stewardship programs that support the protection and recovery of species at risk and their habitats.
- Never buy native species of turtles or any turtles that have been caught in the wild.
- If you see native species of turtles for sale in a pet store or food market, please contact the Ministry of Natural Resources.

CHARLES DOUGLAS ©CMN



SPECIES

Common Name: American Ginseng
Latin Name/Scientific Name: *Panax quinquefolius*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- A perennial herb that grows up to 60 centimeters tall.
- Individual plants take several years to reach reproductive maturity.
- The root of this plant resembles a gnarly parsnip.
- The single stem ends in a whorl of one to four or occasionally five leaves.
- Each leaf typically has five leaflets radiating from a central point at the end of the leaf stem.
- Mature plants have an erect stem originating from the top of the main stem, at the center of the whorl of leaves, with a cluster of six to 20 inconspicuous greenish-white flowers.
- The fruit consists of fleshy, bright-red berries in a semi-spherical cluster.

Habitat:

- Typically grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple (Acer saccharum), White Ash (Fraxinus americana) and American Basswood (Tilia americana).
- It usually grows in deep, nutrient rich soil over limestone or marble bedrock.

What you can do:

- Report any observations of ginseng to the Ministry of Natural Resources – but keep the location secret otherwise, to reduce the risk of poaching.
- Report any incidents of poaching to 1-877-TIPS-MNR (847-7667).
- Volunteer with your local nature club or provincial park to participate in surveys or stewardship work focused on species at risk.

PLANTS

SPECIES

Common Name: Butternut
Latin Name/Scientific Name: *Juglans cinerea*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- Medium-sized tree that can reach up to 30 meters in height.
- It belongs to the walnut family and produces edible nuts in the fall.
- Bark on a younger tree is grey and smooth, becoming ridged as it ages.
- Easily recognized by its compound leaves, which are made up of 11 to 17 leaflets (each nine to 15 centimeters long) arranged in a feather-like pattern. The terminal leaflet at the end of each leaf is usually the same size as the other leaflets (in the closely related black walnut, the terminal leaflet is usually much smaller or even missing entirely).
- The fruit is a large nut that contains a single seed surrounded by a light green, sticky, fuzzy husk. It resembles a lime or a lemon.

Habitat:

- Very common in Ottawa, and usually grows alone or in small groups in deciduous forests.
- Prefers moist, well-drained soil and is often found along streams.
- It is also found on well-drained gravel sites and rarely on dry rocky soil.
- This species does not do well in the shade, and often grows in sunny openings and near forest edges.

What you can do:

- Consider removing trees that are shading Butternuts in order to help keep them strong and encourage seed production.
- The Forest Gene Conservation Association is interested in learning where Butternuts are surviving the Butternut Canker disease. To report Butternut trees or for help getting trees assessed for Butternut Canker or finding seed and seedlings, contact the Ontario Woodlot Association at www.ont-woodlot-assoc.org or visit the Forest Gene Conservation Association website at www.fgca.net

SPECIES

Common Name: Eastern Prairie Fringed-Orchid
Latin Name/Scientific Name: *Platanthera leucophaea*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- Rare orchid that is native to Ontario.
- The plant has fringed white flowers (up to 3 cm wide), with a characteristic “lip” that serves as a landing platform for pollinating insects.
- Each flower has a very deep “nectar spur” that contains lots of nectar, which only large insects such as Hawkmoths with long probosci (mouthparts) can access.
- Flowers open gradually, starting from the bottom of the stalk, and last for about ten days.
- A large plant may have flowers for a total of three weeks.
- If you are watching the same plants from year to year, keep in mind that this orchid may not flower every year.
- It can lie dormant for several years in between flowering.

Habitat:

- Grows in wetlands, fens, swamps and tallgrass prairie.
- It has been found in ditches and railroad rights of ways.

What you can do:

- Habitat destruction is one of the leading threats to this orchid.
- Conserve wetland habitat.
- “Mud bogging” by all-terrain vehicles is a threat to this species locally. Be responsible in your use of such vehicles – don’t trespass, stay on approved trails, and encourage others to do the same.
- Get involved with a habitat creation or restoration project in your area, or even on your own property.

LICHENS

SPECIES

Common Name: Flooded Jellyskin
Latin Name/Scientific Name: *Leptogium rivulare*

STATUS

Ontario ESA: Threatened
Federal SARA: Threatened

Description:

- A leaf-like lichen with bluish-grey lobes, a smooth, unwrinkled surface, with numerous small brown discs which are the fruiting bodies.
- When it gets wet, the lobes become gelatinous and translucent, resulting in the name "jellyskin".
- Lichens grow slowly – perhaps only one to two millimeters per year.
- Individuals can grow to about 6 centimeters, but are more often found in clusters that can form large aggregations on tree bases, and sometimes rocks, up to half a meter wide.

Habitat:

- Mainly found growing on the bark at the base of trees that are periodically flooded, typically during the spring.
- The trees are species that can withstand substantial flooding such as: Black Ash, Red Maple, American Elm and more rarely, Balsam Poplar.
- It can also be found growing on rocks that are subject to similar periodic flooding.

What you can do:

- Conserve forest and wetland habitat.
- Contact local naturalist groups such as the Ontario Vernal Pool Association www.ontariovernalpools.org to find out how you can help improve habitat for Flooded Jellyskin.

LICHENS

SPECIES

Common Name: Pale-Bellied Frost Lichen
Latin Name/Scientific Name: *Physconia subpallida*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- Was named for its pale lower surface and sometimes bright white crust-like growth on the upper surface that resembles a dusting of frost.
- It is usually found in wooded areas where its light colour can be eye catching against the darker surfaces on which it grows (e.g., trees, boulders).
- The undersurface is light in colour in comparison to the undersurfaces of its closest relatives, which can be much darker, even black.

Habitat:

- Grows on the bark of hardwood trees such as; Ironwood, White Ash, Black Walnut, and American Elm.
- It has also historically been found growing on fence posts and boulders.
- In Ontario, grows on Hop Hornbeam (also known as Ironwood) trunks at a height of 0.5 to 2 meters in shaded mature wooded areas.

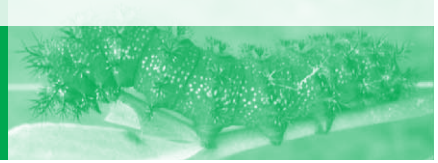
What you can do:

- Conserve forests and surrounding natural vegetation on your property.

KEMPTVILLE MNR POSTER


CHRIS LEWIS ©CMN

INSECTS



SPECIES

Common Name: Bogbean Buckmoth
Latin Name/Scientific Name: *Hemileuca species*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- Medium to large-sized moth with forewings about 26 to 36 millimeters long.
- Body is largely black with a white collar and both white and orange markings on the thorax and abdomen.
- Each wing is dark with a thick white band and small dark spot either wholly or mostly within the band.
- The larvae, which are mostly black with reddish-orange branched spines along the back, feed primarily on the bogbean plant.
- Has a one-year life cycle.
- These moths spend the winter as eggs and emerge as larvae the next spring, becoming adults in mid- to late September.
- They are active during the day, typically only in warm, sunny weather.
- Adults are capable of flying for several kilometers, but rarely leave the fens where they live

Habitat:

- Is restricted to open, chalky, low shrub fens containing large amounts of bogbean, an emergent wetland flowering plant.

What you can do:

- Conserve fen habitat. If walking in or near a fen, be careful to not disrupt the habitat.
- Control invasive species such as the European Common Reed, which can out-compete the native bogbean and is therefore a threat to the Bogbean Buckmoth.
- To learn what you can do to help reduce the threat of invasive species, visit: ontario.ca/invasivespecies; www.invadingspecies.com; www.ontarioinvasiveplants.ca; and, www.invasivespecies.gc.ca.

INSECTS

SPECIES

Common Name: Monarch Butterfly
Latin Name/Scientific Name: *Danaus plexippus*

STATUS

Ontario ESA: Special Concern
Federal SARA: Special Concern

Description:

- Orange and black butterfly with small white spots.
- Relatively large species with a wingspan reaching 93-105 millimeters.
- The Monarch's caterpillar is easily recognized: It has black, white and yellow stripes and can be found feeding on milkweed plants.
- After their feeding and growth stage, the Monarch caterpillar molts into a striking jade-coloured chrysalis with golden spots.

Habitat:

- Throughout their life cycle, Monarchs use three different types of habitat.
- Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows.
- Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers.
- Monarchs spend the winter in Oyamel Fir forests found in central Mexico.

What you can do:

- Allow milkweed to grow and flower.
- Journey North is an online project that tracks the migration of Monarchs. Classrooms can participate by sharing their sightings at: www.learner.org/jnorth/monarch.
- Pesticides can be harmful to Monarch habitat. To learn how to keep your lawn and garden healthy and green without using pesticides visit: www.ene.gov.on.ca/environment/en/category/pesticides/STDPROD_085338.html

INSECTS

SPECIES

Common Name: Rusty Patched Bumblebee
Latin Name/Scientific Name: *Bombus afinis*

STATUS

Ontario ESA: Endangered
Federal SARA: Endangered

Description:

- A medium to large bee, ranging from about one to two centimeters long with queens being at the higher end of this range.
- Like most bumble bees, it is yellow and black, but males and workers have a distinctive rusty-coloured patch on the second segment of the abdomen.

Habitat:

- Typically to bumble bees, this species can be found in open habitat such as mixed farmland, urban settings, savannah, open woods and sand dunes.
- The most recent sightings (all of which were in southwestern Ontario) have been in oak savannah, which contains both woodland and grassland flora and fauna.

What you can do:

- To provide nectar and pollen for bumble bees, plant a variety of native flowering plants in your garden. Bees tend to prefer pink, purple, and yellow flowers and need food from early spring to late fall.

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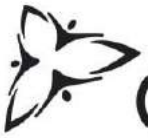
PARTNERSHIPS & CONTRIBUTIONS

South Nation Conservation
De la Nation Sud



Ontario
Ministry of Natural Resources
Ontario Stewardship

Ottawa Stewardship Council

Office de protection de la nature de la vallée Rideau
Rideau Valley Conservation Authority

Mississippi Valley Conservation Authority

NCC CCN Canada

OBC
Ottawa Bird Count
www.ottawabirds.ca

Ottawa Field Naturalists

Emerald Links

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Ontario Trillium Foundation
Fondation Trillium de l'Ontario

Harold Crabtree Foundation


Ottawa Stewardship Council

PLANNING AND GROWTH MANAGEMENT
URBANISME ET GESTION DE LA CROISSANCE

Protocol for
Wildlife Protection
during Construction

August 2015

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City of Ottawa Protocol for Wildlife Protection during Construction

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City of Ottawa Protocol for Wildlife Protection during Construction

PREAMBLE

The updated City of Ottawa Protocol for Wildlife Protection during Construction has been developed in response to a direction provided by Council on July 17, 2013, as part of the City's Wildlife Strategy. The protocol is a compilation of best practices that serves as a guide and a common frame of reference for the City and the development industry in addressing wildlife protection during construction. The protocol also serves as a guide and frame of reference for City staff involved in planning and carrying out capital projects or other activities that may affect wildlife and wildlife habitat. The protocol itself is not intended to define new requirements for wildlife protection during construction, nor does the protocol provide for proponents of development a means to not adhere to other applicable legislation such as the *Endangered Species Act, 2007* or the *Migratory Birds Convention Act*. The techniques and methods to provide for wildlife protection will continue to be identified by proponents of development through studies that are required as set out in the Official Plan (e.g., Environmental Impact Statements, Tree Conservation Reports) to meet legislative requirements and with consideration to best practices as compiled within this document. Specific requirements for wildlife protection will continue to be defined by staff in consultation with proponents and their consultants, and included as conditions of approval where appropriate through subdivision, condominium and site plans.

1 Introduction

This protocol is intended to help reduce the direct impacts of development on wildlife that occur during construction. It also provides some guidance on how to help reduce conflicts between residents and wildlife in newly-constructed neighbourhoods, through better wildlife-proofing and awareness. The protocol complements and supports the City's Environmental Impact Statement (EIS) Guidelines, which address impact assessment and mitigation in a more general way during the development planning and review process, and the Tree Conservation Report (TCR) Guidelines, which address impact assessment and mitigation for trees. The protocol promotes best management practices relating to sensitive timing windows for clearing, pre-stressing, site clearing, construction site management, wildlife encounters, wildlife-proofing, and owner awareness.

1.1 Application of protocol

This protocol may be used to guide wildlife protection planning in plans of subdivision, plans of condominium, and site control plans for properties that include or are located adjacent to wildlife habitat, including:

- areas of tall grass;
- shrubs;
- trees or woodlands;
- watercourses;
- wetlands; or,
- complex features such as rock piles, junk heaps, or vacant structures.

Applicants will be advised of the protocol's relevance to their site at pre-consultation.

If a proposed development requires an Environmental Impact Statement or a Tree Conservation Report under the policies of the Official Plan, any recommendations in the EIS/TCR related to mitigating impacts to wildlife from construction activity will be expected to meet or exceed the standard of protection established in this protocol. The recommendations from the EIS/TCR will be used by City staff during the development review process to develop conditions of approval for the project.

This protocol also provides useful information for City staff and members of the public, which can be referred to when planning other projects and activities, such as the development of single lots under a building permit, the construction of new infrastructure, or in non-development related vegetation clearing.

1.2 Other Legislative Requirements

This protocol provides guidance on best practices to protect Ottawa's wildlife during construction and related activities. There are several legislative requirements for the protection of various species or groups of wildlife (e.g., provincial *Fish and Wildlife Conservation Act, 1997* and *Endangered Species Act, 2007*; federal *Species at Risk Act, Migratory Birds Convention Act*, and *Fisheries Act*). It remains the responsibility of the property owners and their agents to ensure that their actions comply with all applicable legal requirements.

1.3 Wildlife Expertise

Project proponents will typically rely on professional biologists or environmental consultants to advise them with respect to wildlife. Other potential sources of information and advice on wildlife include wildlife service providers, wildlife rehabilitators and other local experts, as well as relevant agency staff (e.g., Ministry of Natural Resources and Forestry, Canadian Wildlife Service). Links to various sources of additional information that may be useful in wildlife protection planning are provided in Section 4 of this protocol.

Wildlife rehabilitators provide care for orphaned or recuperating wildlife, with the aim of returning them to the wild when they are able to care for themselves. Rehabilitators must receive authorisation from the Ministry of Natural Resources and Forestry (and/or Environment Canada, for migratory birds) on an annual basis. There are very few authorised rehabilitators in the Ottawa area (see links in Section 4). By making pre-arrangements with wildlife rehabilitators, as recommended in this protocol, project proponents can help rehabilitators to

determine whether local capacity exists to handle their potential needs. Rehabilitators and other local experts can also advise proponents on ways to avoid injuring or orphaning wildlife, thus reducing the need for rehabilitation. Similarly, pre-arrangements should be made with local veterinarians to ensure that they are able to treat injured wildlife.

2 Best Practices

2.1 Project-specific Wildlife Protocol

For some projects where an EIS has identified large areas of wildlife habitat, or particularly sensitive areas of wildlife habitat, a project-specific wildlife protocol may be needed to ensure that the recommendations in the EIS are appropriately implemented during construction. The following information should be clearly conveyed to the on-site staff as part of the project-specific wildlife protocol, via notes on plans, handouts and/or on-site briefings:

- Schedule for pre-construction activities such as inspections for wildlife, installation of protective fencing, pre-stressing, and on-site briefings for contractors;
- Description of wildlife mitigation measures to be used during construction, including;
    - Identification of any natural areas, trees or other features to be retained;
    - Placement and specifications of required protection measures (e.g., fencing, signs);
    - Phasing and direction of site clearing activities;
    - Any recommendations regarding internal access routes for vehicles and other heavy equipment, vehicle parking, materials staging and stockpiling, fuel storage and handling, etc.; and,
- Guidance on how to deal with wildlife encounters, including any species at risk that may be present, and arrangements for dealing with injured or orphaned wildlife. This guidance should be summarized in a handout suitable for quick reference by on-site staff (see example in Appendix 1).

When a project-specific wildlife protocol is needed, it should typically be developed close to or following approval of the project, when the plans have been finalized and more information on scheduling is available. For projects involving early servicing or other site preparation activities in advance of approval, the EIS consultant should provide appropriate advice on wildlife protection measures prior to the commencement of on-site activities. This can be done in conjunction with the Tree Conservation Report requirements, where applicable.

2.2 Sensitive Timing Windows

The greatest disruption to wildlife generally occurs when a site is cleared, removing the existing habitat. The timing of site clearing should be carefully considered, because the impacts to wildlife will be greater during sensitive times of the year. During the winter, overwintering and hibernating wildlife may be physically unable to escape from the site, or may freeze or starve to death if forced to leave their dens and food caches. In the spring and summer, most species are more mobile, but mothers will be laying eggs or bearing young. The most profound impacts to wildlife occur when they are displaced from their habitat at such critical times during their life cycle. Table 1 identifies sensitive times of the year for various habitat types and wildlife. This information can be used to determine what time(s) of year may be sensitive at a particular site, based on which types of habitat and wildlife are actually

present. Where possible, site clearing should be planned to occur outside of the applicable sensitive time(s); otherwise, additional mitigation measures should be employed to reduce the impacts.

These timing windows are provided for guidance only, and should not be relied upon in cases where legislated restrictions apply (e.g., under the *Endangered Species Act, 2007*). The federal *Migratory Birds Convention Act* prohibits the unauthorized killing or harassment of migratory birds and the disturbance or taking of their nests and eggs, but does not refer to specific timing windows. The Canadian Wildlife Service (Environment Canada) provides information on how to avoid impacts to migratory birds and their nests during construction, including the timing of bird breeding seasons in Canada (see list of Additional Resources in Section 4.0 below) in order to assist proponents in their project planning; however, these are not legislated dates, and the federal prohibitions apply throughout the year.

All sites should be inspected by a biologist prior to clearing, to identify any potential wildlife issues (e.g., hibernating animals or nursing mothers and their young, etc.) and to inform or adjust mitigation planning as needed. The timing and scope of this inspection will vary depending on the type and extent of habitat to be affected, the availability of existing information about the wildlife on the site (from an EIS or other sources), and the anticipated timing for site clearing. Table 1 includes recommendations for specific habitat searches that should be included in the scope of the EIS, where applicable, or the site inspection. For more information about the timing of site inspections and associated pre-stressing activities that should occur prior to clearing, see Section 2.3, Pre-stressing below.

In cases where site clearing needs to occur during sensitive times of the year (and no regulated restrictions apply) additional mitigation measures may be needed to reduce impacts to wildlife. Potential mitigation measures include:

- More intensive pre-stressing to encourage resident wildlife to leave the site;
- Installation of appropriate nesting boxes around the periphery of the site, to compensate for nesting sites (e.g., cavity trees, squirrel dreys) that will be removed;
- In some cases, where winter food caches will be lost and other sources of food are scarce, supplemental food sources may need to be temporarily provided in safe locations away from the work space;
- Retention of qualified agents to provide on-site monitoring during site clearing, and/or on-call advice and assistance;
- Pre-arrangements made with wildlife rehabilitators and qualified veterinarians to ensure appropriate care of orphaned or injured wildlife.

2.3 Pre-stressing

“Pre-stressing” is a term used to describe actions taken to encourage wildlife to move away from a site prior to the onset of construction. Common methods of pre-stressing include having one or more people walk the site while talking loudly or playing loud music, or placing pieces of cloth or other objects that carry a strong human scent into animal dens. To be effective, these measures may need to be combined and repeated several times over the course of two to three weeks. Some common pre-construction activities, such as surveying, or installing protective fencing, can contribute to pre-stressing. In urban areas where wildlife are already accustomed to human presence, pre-stressing using human sounds and scents may be less effective; other repellants may be needed.

Table 1: Sensitive times for wildlife in various habitats, with recommendations for reducing impacts of construction*

Habitat Type	Wildlife	Sensitive time(s)	Recommendations
Grasslands and old fields	Migratory birds and raptors Small mammals and other wildlife Note: several Species at Risk birds use grasslands and open habitats; consult Ministry of Natural Resources and Forestry (MNRF).	April through mid-August (breeding season for most species) Mid-October through March (for overwintering woodchucks, if present)	Reduce potential wildlife usage by mowing outside of breeding season, then maintain as mowed grass until on-site work begins. Woodchucks, if present, may persist on mowed sites. Avoid impacting burrows during sensitive times for this species, where possible.
Shrubs or trees (growing as individuals or in small clumps or hedgerows)	Migratory birds and raptors Small mammals and other wildlife	The following only apply if wildlife are actually using the habitat: March through mid-August (breeding season for most species) Mid-October through March (for cavity trees or other den sites)	Retain a biologist to inspect habitat. If no active nests or dens are present, clearing should be done within a few days of inspection (during sensitive times of year, clearing should occur the same day if possible).
Thickets or woodlands	Migratory birds and raptors Mammals and other wildlife Note: several Species at Risk use thicket, edge and woodland habitats; consult MNRF.	March through mid-August (breeding season for most species) Mid-October through March (for overwintering wildlife)	Do not clear during sensitive times of the year, unless mitigation measures are used to reduce risks to wildlife. The Canadian Wildlife Service does not support relying on inspections for migratory bird nests in such habitats, due to the difficulty of locating all nests and the risk to the birds.
Complex features (e.g., piles of	Mammals and other wildlife (e.g., snakes)	March through July (breeding season for most	Retain a biologist to inspect habitat prior to removal. In cases where

*NOTE: The information in this Table can be used to determine what time(s) of year may be sensitive at a particular site, based on which types of habitat and wildlife are actually present. Where possible, site clearing should be planned to occur outside of the applicable sensitive time(s); otherwise, additional mitigation measures should be employed to reduce the impacts. The recommendations provided do not address Species at Risk requirements under the *Endangered Species Act, 2007*. For situations involving Species at Risk, regulated timing restrictions, mitigation measures or compensation requirements may apply (consult the Ministry of Natural Resources and Forestry for more information).

Table 1: Sensitive times for wildlife in various habitats, with recommendations for reducing impacts of construction*

Habitat Type	Wildlife	Sensitive time(s)	Recommendations
rock or wood, stone walls, derelict vehicles, junk heaps, etc.)		species) October through March (for overwintering wildlife, including snakes)	presence of wildlife is confirmed or uncertain, disassemble slowly, outside of relevant sensitive time(s), to reduce potential impacts and allow wildlife time to relocate.
Vacant buildings or other structures	Some birds Small mammals and other wildlife (e.g., snakes) Note: some Species at Risk, including barn swallows and little brown bats, use buildings and other structures; consult MNRF.	March through mid-August (breeding season for most species) Mid-October through March (for overwintering wildlife)	Retain a biologist to inspect habitat prior to removal. In cases where presence of wildlife is confirmed or uncertain, demolition may need to be done in controlled stages, outside of relevant sensitive time(s), to reduce potential impacts and allow wildlife time to relocate.
Wetlands and waterbodies	Migratory birds, including waterfowl Mammals Aquatic reptiles and amphibians Fish Note: many Species at Risk use wetlands and other aquatic habitats; consult MNRF.	March through August (breeding season for most species); note that this includes regulated in-water timing restriction for warmwater fishes (March 15 to June 30) August through October (emergence of hatchling turtles, if turtle nests are present) Mid-October through March (for overwintering wildlife, including turtles)	Do not clear during sensitive times of the year, except in cases where exclusion fencing or other mitigation measures can be used to reduce risks to wildlife. Exclusion fencing can be useful when working in or around these habitats, to prevent wildlife (especially turtles) from entering work areas. Fish and other highly aquatic wildlife such as turtles and frogs may need to be relocated prior to commencing work (permits required from MNRF for relocation).

*NOTE: The information in this Table can be used to determine what time(s) of year may be sensitive at a particular site, based on which types of habitat and wildlife are actually present. Where possible, site clearing should be planned to occur outside of the applicable sensitive time(s); otherwise, additional mitigation measures should be employed to reduce the impacts. The recommendations provided do not address Species at Risk requirements under the *Endangered Species Act, 2007*. For situations involving Species at Risk, regulated timing restrictions, mitigation measures or compensation requirements may apply (consult the Ministry of Natural Resources and Forestry for more information).

Timing and frequency of pre-stressing activities will vary depending on the site context, the amount of information known about wildlife at the site, and the proposed schedule for site clearing. Suggested site inspection and pre-stressing schedules are as follows:

- For sites with good wildlife information and/or little habitat to be affected, that will be cleared outside of any applicable sensitive timing windows (low risk of impacts): one site inspection combined with pre-stressing within a few days prior to clearing.
- For sites with poor wildlife information and/or larger areas of habitat being affected, that will be cleared outside of any known sensitive timing windows (moderate risk of impacts): first site inspection 2-3 weeks in advance, with pre-stressing and follow up inspections as needed based on results; final inspection/pre-stressing on the day before clearing for each phase.
- For sites that will be cleared during sensitive times of the year (high risk of impacts): first site inspection 3+ weeks in advance with multiple pre-stressing and follow up inspections; final inspection/pre-stressing on the day before clearing for each phase.

Note: for sites located within or adjacent to existing developed areas, nearby residents should be informed about the onset of pre-stressing activities and the potential for increased encounters with wildlife dispersing from the site. Sources of information on avoiding conflicts with wildlife should be provided (see Section 4). The City's Noise By-law needs to be respected.

2.4 Site Clearing

Vegetation removal (including mowing of tall grass) and other site clearing activities should proceed in phases, generally moving from the most disturbed part of the site (closest to existing development) towards the least disturbed part of the site. Even on small sites that can be cleared in a single day, it is important to follow this pattern in order to "herd" wildlife out of the site into adjacent undisturbed habitat, or towards the nearest habitat. Some examples of possible scenarios are provided below. Site clearing should be timed to avoid disturbance of habitat areas during sensitive times of the year (see Section 2.2) where possible.

Scenario 1: The work space directly abuts a natural area or open space that will be protected and retained.

Site clearing activities should begin at the far side of the property from the retained natural area and proceed towards it. The goal is to ensure that any wildlife within the work space can retreat into the retained natural area without having to cross cleared lands.

Scenario 2: There is an existing natural connection (stream corridor, hedgerow or other natural linkage) between the work site and a nearby natural area.

Site clearing activities should be phased to funnel wildlife towards the existing connection. Areas of habitat within the work space should not become isolated from the connection until the final stages of this process.

Scenario 3: The site includes one or more isolated areas of habitat to be cleared, with no existing connection to other natural areas nearby.

One or more open "escape routes" between the habitat and the edge of the site should be maintained until the final phases of vegetation clearing are completed. These escape routes should be defined on the site with fencing to ensure they stay open, and to help channel wildlife movement. Clearing should begin at the far side of the habitat and proceed towards the designated escape route.

In all cases, each area to be cleared should be inspected (and, if necessary, pre-stressed) by the project biologist one more time the day before clearing, to determine whether any trees or other habitat features are still being used by wildlife. Any occupied trees/features should be flagged for temporary retention for at least one additional day, to allow wildlife a last chance to move out. In cases where occupancy is uncertain, the same precaution should apply. If they do not leave on their own, then it may be necessary to have a professional wildlife service provider relocate them, in accordance with applicable laws (e.g., *Fish and Wildlife Conservation Act*, *1997* for most commonly encountered wildlife species). Relocation is not an option for some species; for example, if a migratory bird is nesting on site, a protected buffer zone may need to be established and maintained until the birds are finished nesting (the width of such buffer zones varies depending on the species, and should be determined by the project biologist in consultation with Environment Canada). This may affect the phasing or overall schedule for site clearing and subsequent on-site activities.

Any fencing between the work space and the natural habitat to which wildlife are being directed during site clearing must allow for wildlife passage; otherwise, wildlife may be unable to escape from the site. Acceptable fencing options are those which provide low gaps at the bottom of the fence to permit passage by small to medium species, and which are no more than 1.2 m high for larger species such as deer to leap over. Plastic snow fencing can be used, if suitable gaps are provided at intervals along the bottom edge (these can be cut out, or natural gaps caused by uneven terrain at the base of the fence). Once the work space has been cleared, these gaps should be closed or a more secure perimeter fence can be installed to reduce the risk of wildlife returning to the site.

2.5 Construction Site Management

Construction sites are normally managed to promote safety, efficiency and legal compliance. Site management is a key factor in reducing the overall environmental impact of the project, by controlling the risks of environmental contamination, soil compaction, and damage to trees and other natural features intended for retention. It also helps to reduce the risks to wildlife, by controlling the activities on-site that could directly or indirectly harm them.

All personnel should be briefed about wildlife protection measures at the outset of the project, in order to ensure that these measures are clearly understood and appropriately implemented. The briefing needs to provide an overview of the mitigation measures that are being used at the site, as well as instructions on what do to if and when wildlife are encountered during the work. It should also include information on any species at risk that may be present, and what to do if one is seen. A laminated handout summarising key information on wildlife protection should be kept on-site at all times for reference by staff (see example of a handout in Appendix 1). The handout should be tailored to suit the needs of each specific project, but should address the following subjects:

- General provisions – e.g., do not harm, feed or unnecessarily harass wildlife; drive slowly and avoid hitting wildlife where possible; keep site tidy and secure
- Species at risk – basic identification tips and recommendations (needs to be modified to address species most likely to be encountered at the site)
- Contact information for:
    - Project biologist / wildlife service provider
    - Ministry of Natural Resources and Forestry, Kemptville (for species at risk)
    - Wildlife rehabilitators and veterinarians (for orphaned or injured wildlife)

The management of the site needs to specifically address how to avoid attracting wildlife to the work space. Although on-site activities will generally discourage wildlife from entering the work space during the day, they may be drawn to the site at night (or on weekends) if it appears to provide sources of food, water or shelter. The following common attractants should be controlled or eliminated:

- Food wastes and other garbage – effective mitigation measures include waste control (prevent littering); keeping all trash secured in wildlife-proof containers, and prompt removal from the site (especially in warm weather).
- Water – effective mitigation measures include ensuring proper site drainage to limit standing pools of water; fencing off temporary storm ponds and other waterbodies within the work space (and not permitting wildlife access to any potentially contaminated waterbodies); and, use appropriate sediment and erosion control measures to protect the quality of surface water adjacent to or downstream of the work space.
- Shelter – effective mitigation measures include covering or containing piles of soil, fill, brush, rocks and other loose materials; capping ends of pipes where necessary to keep wildlife out; ensuring that trailers, bins, boxes, and vacant buildings are secured at the end of each work day to prevent access by wildlife.

While all personnel need to be aware of the wildlife protection measures, one or more people should be specifically tasked with ensuring that those measures are properly implemented, by performing the following duties:

- Checking the work site (including previously cleared areas) for wildlife, prior to beginning work each day;
- Regularly inspecting protective fencing or other installed measures to ensure their integrity and continued function; and,
- Monitoring construction activities to ensure compliance with the project-specific protocol (where applicable) or any other requirements.

For simple, low-risk projects, construction staff may be able to undertake this work (with help from contracted professionals if any issues arise). Large-scale or complex projects may benefit from the presence of a part or full time specialist such as an environmental officer, biologist or wildlife service provider, particularly during site clearing. Professional expertise is strongly recommended in cases where site clearing is being carried out during sensitive times of the year.

2.6 Wildlife Encounters

Ideally, the mitigation measures described above would allow all local wildlife to vacate the site before it was cleared, and no wildlife would return until the project was completed. In reality, however, it is very likely that wildlife will be encountered on-site at some point during the construction process. Wildlife may return to the site after dark, seeking the habitat that used to

be there. They may also be attracted to the site if it appears to provide food, water or shelter, as previously described in Section 2.5. Proper site management will reduce the risk of wildlife trying to move back onto the site, while daily inspections before work begins will reduce the risk of harm to any wildlife that has wandered in overnight.

Any wildlife encountered during site clearing or subsequent construction activities should be allowed to exit the site on their own, via safe routes. Construction staff should not attempt to capture or handle most kinds of wildlife, unless an animal is in imminent peril or is injured and cannot wait for rescue by qualified personnel. Improper handling can result in injuries to both workers and wildlife, and may in some cases contravene provincial or federal legislation. Removal and relocation of mammals, in particular, should only be done by qualified wildlife service providers working in accordance with applicable laws (i.e., *Fish and Wildlife Conservation Act, 1997*).

If young birds or mammals are discovered on a site, contact the project biologist, a wildlife rehabilitator, or other wildlife expert for advice. In most cases, they should be left alone. The mother is very likely nearby and will return if given the chance. For primarily nocturnal species like raccoons and skunks, she may wait until evening to move her family to a safe location.

Useful equipment for wildlife encounters:

- Work gloves, to reduce the risk of injury from bites or scratches
- Push broom for gently redirecting small mammals, reptiles or amphibians
- Clean (uncontaminated) towels or blankets and assorted containers such as plastic sweaterboxes, cat carriers, and a large bin or garbage can for capturing and transporting injured or orphaned wildlife (note: small cardboard boxes or unwaxed paper bags are best for small birds)

Scratches and bites from animals, whether domestic or wild, can result in serious infections and/or transmit diseases. Immediate medical treatment should be sought for any person injured by an animal.

2.7 Wildlife-proofing

Wildlife can cause significant property damage and even health and safety issues when they seek shelter in, on or under buildings. Wildlife-proofing measures have been developed to address these problems, but many of these measures are typically installed by building owners in response to an issue, rather than being installed proactively during the construction of the building. The Ontario Building Code (OBC) does not address the subject of wildlife-proofing in great detail. It does require that sources of natural ventilation (other than windows) be constructed to provide protection from insects and weather, and that outdoor air intakes and exhaust outlets should be screened to prevent entry of animals and insects. However, these requirements alone may not protect a building from wildlife determined to find a way in. The most common access points are through vents, chimneys, roofs and eaves; wildlife will also frequently seek shelter underneath porches, stairs and raised decks.

Builders and contractors are encouraged to go beyond the requirements of the OBC and provide their clients with additional built-in protection against wildlife. This could include upgrading materials to use more wildlife-resistant metal components instead of plastic. Heavy screening or other exclusion measures could be installed to keep wildlife out of crawl spaces under porches or exterior stairs, including below grade to deter digging animals. Quality

assurance programs should include checking for any loose external fittings or gaps that could allow access by wildlife.

Buildings which feature large windows or other expanses of glass may need a different type of wildlife-proofing. These buildings can pose a risk to birds, which may not recognise the glass as a barrier. Many birds are injured and killed in collisions with glass each year, especially during spring and fall migration. Several major cities across North America, including Toronto and Vancouver, have introduced bird-friendly design guidelines to address this issue. FLAP Canada also provides advice on how to reduce risks to birds on its website (see Section 4, Additional Resources, below). Architects are encouraged to consider the potential risks to birds when designing buildings with glass exteriors or large banks of windows, and to take steps to reduce those risks.

2.8 Owner Awareness

Once construction has been completed, the potential conflicts between people and wildlife living in the new development can generally be best handled through education. "Owner Awareness Packages" are commonly required as a mitigation measure for new developments in or adjacent to natural areas. These packages are intended to inform residents about the environmental significance and sensitivities of the natural areas, and also to provide guidance on how to avoid having (or causing) problems, including conflicts with wildlife. There are many available sources of information to draw upon when assembling such packages (see Section 4). The finished product may consist of a simple brochure or one-pager, or may be a more comprehensive handbook. It should include:

- Basic information about common wildlife that may be expected to occur in the area;
- Information about any species at risk that residents should be aware of, and the legal protections associated with these species;
- Information on potential implications of allowing pets to roam unattended (including possible impacts to pets and/or wildlife, as well as legal restrictions under municipal and provincial regulations);
- Recommendations for maintenance of any wildlife-proofing measures included in the building;
- Suggestions on other ways to avoid or reduce human-wildlife conflicts; and,
- Sources of additional information.

3 Conclusion

By following this protocol and planning ahead for wildlife protection, project proponents should be able to reduce construction-related impacts on Ottawa's wildlife, remain compliant with federal and provincial legislation, and help residents to avoid problems with wildlife in the longer term.

4 Additional Resources

City of Ottawa – information on Ottawa's wildlife and conflict avoidance at http://ottawa.ca/en/residents/water-and-environment/animals-ottawas-wildlife

Environment Canada (Canadian Wildlife Service) – information on avoiding incidental take of migratory birds at http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=C51C415F-1

Environment Canada (Canadian Wildlife Service) – general nesting periods of migratory birds in Canada at http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1

FLAP Canada – information on how to reduce building-related risks to birds, including links to various cities' bird-friendly design guidelines, at http://www.flap.org/index.php

Government of Canada – Species at Risk Public Registry, including information on all federally listed species at risk, at http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1

Ministry of Natural Resources and Forestry – information on Species at Risk in Ontario at http://www.ontario.ca/environment-and-energy/species-risk

Ministry of Natural Resources and Forestry – contact information for authorized wildlife rehabilitators at http://www.ontario.ca/environment-and-energy/find-wildlife-rehabilitator

Ministry of Natural Resources and Forestry – illustrated instructions on safe handling of turtles, snakes, amphibians and birds, as well as directions on appropriate relocation and reporting of species at risk encounters, in the "Ontario Species at Risk Handling Manual: For Endangered Species Act Authorization Holders" at http://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_tx_sar_hnd_mnl_en.pdf

Ministry of Natural Resources and Forestry – Species at Risk Branch Best Practices Technical Note on Reptile and Amphibian Exclusion Fencing, at http://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_tx_rptl_amp_fnc_en.pdf

Ottawa-Carleton Wildlife Centre – information on commonly encountered species and conflict avoidance at http://wildlifeinfo.ca/index.html

Ottawa Humane Society – emergency response for injured wildlife, guidance on common wildlife issues, and information on wildlife service providers at http://www.ottawahumane.ca/protection/wildlifeissues.cfm

Ottawa Stewardship Council – Species at Risk Handbook for Ottawa at http://www.ottawastewardship.org

Rideau Valley Wildlife Sanctuary – wildlife rehabilitation centre; information on what to do for apparently orphaned or injured wildlife at http://www.rideauwildlife.org/index.html

Wild Bird Care Centre – wild bird rehabilitation centre; information on avoiding conflicts with birds and what to do for apparently orphaned or injured birds at http://wildbirdcarecentre.org/index.php

Appendix 1: Example of On-site Reference Handout

General Provisions:

- Watch out for wildlife while driving, and avoid hitting them, provided that it is safe to do so.
- Ensure sediment and erosion control measures (i.e., silt fencing) and other protective measures are in place prior to beginning work. Inspect them regularly, and particularly after storm events, to ensure their continued effectiveness.
- Prior to beginning work each day, check for wildlife by conducting a thorough visual inspection of the work space and immediate surroundings.
- Restrict all activities, vehicles and materials to the designated work space. Do not disturb areas identified for retention.
- Secure stockpiled materials, vehicles and structures against wildlife entry.
- Litter and other waste materials must be appropriately contained and promptly disposed of.
- Do not feed any wildlife or leave food out where it could attract them.

For health and safety reasons, and for protection of animals, removal and relocation of mammals must only be done by qualified and properly equipped personnel. Call the wildlife service provider [NAME] at (613) XXX-XXXX for assistance.

For injured wildlife, call the Ottawa Humane Society Emergency Services at (613) 725-1532. For injured birds, call the Wild Bird Care Centre at (613) 828-2849.

Scratches and bites from animals, whether domestic or wild, can result in serious infections and/or transmit diseases. Seek medical treatment immediately for any person injured by an animal.

Wildlife Encounters:

- **Do not harm any wildlife.** Many species are protected under provincial and/or federal legislation. Legal protection of egg-laying species applies to their eggs as well. Penalties for contravening these Acts can be severe.
- **Stand back** and allow the animal to leave the site. Wildlife may be encouraged to move away from the work area by shouting, waving of arms, clapping of hands or gentle redirection using a push broom. Contact project biologist / wildlife service provider for assistance if needed (e.g., if young animals are found). Do not unnecessarily harass any wildlife.
- **Turtles** may need to be helped to safety. Our most common species, Painted and Snapping Turtles, are protected under the Fish and Wildlife Conservation Act, 1997. If one of these turtles is found in the work area, it can be gently removed to a safe location nearby. Wear gloves, or use a broom to steer the turtle into a bucket or other container. Handle with care to avoid injury to the turtle or yourself, particularly when dealing with Snapping Turtles, which may bite or scratch. Turtles may also wet themselves when handled.
- Most of Ottawa's **snakes** are protected under the Fish and Wildlife Conservation Act, 1997. None of them are venomous, but bites may cause infections. Some produce a foul-smelling musk when handled, instead of biting. Snakes will usually try to escape or hide when disturbed, and only defend themselves when trapped. If a snake is found in the work area, it should be gently herded out to a safe location.
- **Stop work immediately** if any species protected under the Endangered Species Act, 2007 are seen in or near the work site (see attached sheet for tips on identifying some commonly encountered species). Take a photograph if possible, to confirm the sighting, and contact the project biologist at (613) XXX-XXXX and the Ontario Ministry of Natural Resources and Forestry – Kemptville District, at (613) 258-8204 or sar.kemptville@ontario.ca. Additional measures to avoid impacts may be required by the Ministry before work can restart.

Commonly Encountered Species Protected under the Endangered Species Act, 2007

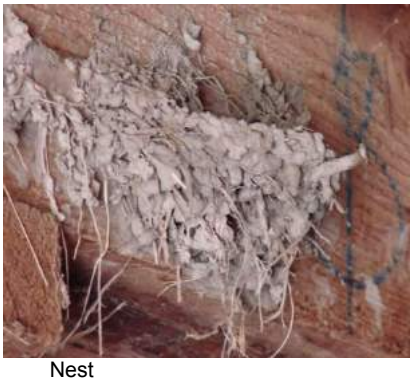
For more information on Ottawa's species at risk, refer to http://www.ottawastewardship.org

Barn Swallow

Dark metallic blue above, buff to orange below. Long, deeply forked tail and pointed wings. Very quick and agile in flight. Cup-shaped nests built of mud and plant fibres on buildings and other structures, including bridge supports and culverts.

Male

Female



Nest

Bank Swallows are similar in shape to Barn Swallows, but do not have such long, deeply forked tails. They are dull brown above and white underneath, with a brownish band across the chest. They nest in burrows dug in exposed soils on steep slopes (e.g., sand pits, fill piles).

Blanding's Turtle

Bright yellow chin and throat. Highly domed, speckled shell up to 28 cm (11 in) in length.

Eggs small, oval and white. Usually less than 12 eggs per nest.

^ Photo courtesy of R. van de Lande

Bobolink

Males black with white back and cream hood during spring and summer breeding season. Females and non-breeding males streaky brown. Nests on the ground in open grasslands and hayfields.

All photos by A. MacPherson unless otherwise specified.

Butternut

Also known as White Walnut. Each leaf has several pairs of leaflets on either side of the main stalk, and one leaflet at the tip. Leaves and twigs grow in an alternating pattern along the branches. The nuts resemble limes or lemons in shape, and have greenish-yellow fuzzy rinds covering a hard, brown, ridged shell.

Butternut tree (centre)

Butternut leaves and fruit

Opened shell of butternut (without rind)

The closely related Black Walnut, which is not a species at risk, has round nuts like tennis balls. Its leaves are very similar to Butternut's leaves, but the terminal leaflet at the tip of each leaf is often much smaller than the other leaflets, or missing entirely. Ash trees may also appear similar to Butternut at first, with very similar leaves, but ash leaves and twigs grow in opposite pairs rather than alternating.

Eastern Meadowlark

Streaky grayish-brown bird with bright yellow front marked by black "V." Short tail has white edges on each side. Nests on the ground in open grassy areas; often seen perching on fence posts or shrubs.

All photos by A. MacPherson unless otherwise specified.

APPENDIX 3

QUALIFICATIONS OF ASSESSORS

Anna Graham, M.E.S.

patersongroup

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

POSITION

Environmental Assessor

EDUCATION

McGill University, B.Sc. 2010
Biology and English Literature

Queen`s University, M.E.S. 2012
Environmental Studies

EXPERIENCE

2014 to Present
Paterson Group Inc.
Consulting Engineers
Environmental Assessor

2013 to 2014
Civica Infrastructure Inc.
Municipal Water Resources Engineering - Vaughan
Project Support Coordinator, Project Proposal Writer

PROJECTS

Environmental Impact Statements – various, Ottawa
Phase I Environmental Site Assessments – various, Ottawa
Flood Mapping Project Coordination – Credit Valley Conservation Authority
Manhole Survey Tool Design and Data Processing – City of Markham
Proposal Preparation – Utilities Kingston Inflow and Infiltration Study, City of Peterborough Drainage Study