Document 1

Wildlife Strategy – City of Ottawa

Report and Recommendations

June 2012

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Planning and Growth Management Department

Planning and Infrastructure

Contents

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Appendices

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1. Council Direction

On February 24, 2010, City Council directed staff to develop an integrated and comprehensive Wildlife Strategy. The specific elements of the direction, as established by Council's motion, were:

- To bring the wildlife strategy to a joint meeting of the Agriculture and Rural Affairs Committee (ARAC) and the Planning and Environment Committee (PEC) for discussion.

- To involve appropriate City departments, the National Capital Commission, the Ministry of Natural Resources, other relevant agencies and community stakeholders in its [the Wildlife Strategy's] development and implementation.

- To center the wildlife strategy on "wildlife-sensitive planning, with a focus on public education and awareness programs."

- To include "protocols to be required in conditions of plans of subdivision and site plans."

The scope of the Wildlife Strategy must reflect the context of Council's direction. Council passed its motion in the context of public concern and confusion regarding the hazards and degree of risk to public safety posed by coyotes within or adjacent to urbanized areas of the City, and public debate regarding the appropriate response of the City and other agencies to their presence, behaviour and welfare. Council subsequently expanded its direction to staff to include potentially hazardous large animals, after several incidences of moose wandering into urban, residential areas of the City.

In consideration of the context and intent of Council's directions to staff, the scope of the Wildlife Strategy includes:

- The review, summary and analysis of City and agency planning principles, policies, practices and tools with respect to wildlife-sensitive planning;

- The review, summary and analysis of City principles, policies, practices and tools with respect to routine management of wildlife on City property;

- The review, summary and analysis of public education and awareness materials promoting positive human – wildlife interactions in urban and rural areas;

- The development of a strategy and recommendations with respect to all of the above areas.

Responsibility for implementing Council's direction was given to Planning and Growth Management, with the support of By-law and Regulatory Services and the Rural Affairs Office.

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2. Ecosystem Context of the Wildlife Strategy

Ottawa's 2003 Environmental Strategy described the necessary components of a Biodiversity Strategy for the City. Along with goals for protection and restoration of natural spaces and habitats, it included "living in harmony with wildlife within both the rural and urban areas". Specifically, it identified the need to develop "approaches for humans and wildlife… to live within the same places without conflict."

In early 2010, City Council directed staff to develop a Wildlife Strategy that would address these goals from an ecosystem perspective, "centered on wildlife-sensitive planning, with a focus on public education and outreach." Council's emphasis on an ecosystem approach reflected a desire to move past reactive policies and actions based on immediate concerns for particular species; it reflected a desire for proactive policies and actions that facilitate and foster a more harmonious relationship with all wildlife. Nonetheless, it must be recognized that Council's direction was motivated not only by general concerns for biodiversity and harmony with nature, but by specific issues and complaints arising from the City's current policies and procedures for dealing humanely with individual animals or populations of animals. Ottawa's Wildlife Strategy, therefore, should strive to reflect the full complexity of human relations with wild animals, from impacts of urban expansion on the integrity and connectivity of wildlife habitat, to the welfare of individual animals in conflict with human needs.

3. Existing Planning Policies and By-laws with Respect to Wildlife

The City's planning policies and practices with respect to wildlife reflect the direction given to municipalities by the Province of Ontario in the Provincial Policy Statement, 2005 (PPS) under the *Planning Act*, especially Section 2.1 – Natural Heritage and Section 2.2 – Water. As stated in Section 4.5 of the PPS, "the official plan is the most important vehicle for implementation of this Provincial Policy Statement." The province's Natural Heritage Reference Manual (2010) provides more direction. It says:

> "To implement the natural heritage policies of the PPS, planning authorities should include policies in their official plans to:
>
> - Identify natural heritage systems and ways in which the biodiversity, connectivity and ecological functions of the system will be maintained, restored or improved;
> - Identify and protect natural heritage system features and areas and their ecological functions;
> - Protect these features, areas and ecological functions from incompatible land uses and activities; and
> - Provide a clear and reasonable mechanism for assessing the impact of applications for land use change on these features, areas, their adjacent lands and ecological functions" (p. 12).

The PPS speaks directly to wildlife in two places.

> Policy 2.1.3 says that, "development and site alteration shall not be permitted in... a) significant habitat of endangered species and threatened species".

> Policy 2.1.4 says that, "development and site alteration shall not be permitted in... d) significant wildlife habitat... unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions." The PPS does not define "significant wildlife habitat." However, the Natural Heritage Reference Manual (2010) identifies "four categories of significant wildlife habitat" (p. 83):
>
> - Habitats of seasonal concentrations of animals;
> - Rare vegetation communities or specialized habitat for wildlife;
> - Habitat of species of conservation concern;
> - Animal movement corridors.

More detailed direction and criteria for the identification of significant wildlife habitat is provided by the provincial Significant Wildlife Habitat Technical Guide (2000).

As outlined in *Document 4 – Current Planning Practices for Wildlife*, Ottawa's Official Plan contains numerous policies for achievement of the PPS objectives with respect to natural heritage systems. However, under the PPS, the City must always balance its natural heritage policies with policies intended to achieve other objectives. These objectives not only include social and economic objectives, such as the promotion of strong communities and long-term economic prosperity, but the protection of other important resources, such as agriculture and mineral aggregate resources. The PPS does not give priority to one set of policies over another. In practical terms, this means that accommodation of economic and urban growth will sometimes affect Ottawa's natural areas, biodiversity and wildlife habitat. When they do, Ottawa has several tools available to assess the potential for impact, to identify options for mitigation and compensation, and to help determine if the net impacts are reasonable and necessary.

At the broadest scale, the Official Plan itself is a *de facto* ecosystem management tool, as defined by the Ecological Society of America.

> *Ecosystem Management is management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem composition, structure and function.* Ecosystem management does not focus primarily on the "deliverables" but rather on sustainability of ecosystem structures and processes necessary to deliver (Christensen *et al* 1995)

Many of the most important ecosystem management and natural heritage decisions are made in the Official Plan's land use schedules and supporting master plans (*i.e.* the Transportation Master Plan, the Infrastructure Master Plan, the Greenspace Master Plan). The most far-reaching decision is the identification of the urban boundary. The more compact is the urban boundary, the less impact it has on the natural landscape and wildlife habitat. Conversely, any decision to designate lands as *urban*, *agricultural*, *village*, *etc...* is also a decision to give greater importance to their social and economic values than their natural, ecological functions now and in the future. At best, some portions of those lands may be retained in a natural or semi-natural state, with limited ecological functions. Similarly, the

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decision to designate lands as *natural environment area* or *significant wetland* is also a decision to maintain or enhance their ecological functions now and in the future.

At their heart, these are decisions based upon competing human values, of which natural heritage (including the protection and welfare of wildlife) is one of several considerations. Acknowledgement and consideration of competing values is a critical part of ecosystem management – albeit with intergeneration sustainability of the greater ecosystem composition, structure and function as a necessity (Christensen *et al* 1995).

When a major infrastructure project is proposed, it is usually subject to an environmental assessment *(EA)* under the provincial *Environmental Assessment Act* and may also be subject to the federal *Canadian Environmental Assessment Act*. When a development application is submitted under the *Planning Act* for a project located in or adjacent to the City's natural heritage system, it is subject to an Environmental Impact Statement (EIS) under Section 4.7.8 of the Official Plan. Both kinds of study are intended to assess the potential impacts on the natural heritage system, to propose appropriate mitigation or compensation measures, and to determine under what conditions the project or development should proceed. After the Official Plan, they are the City's primary planning tools for protection of wildlife and wildlife habitat.

Unfortunately, a common misunderstanding exists regarding consideration of the natural heritage system in the EA and EIS processes. As discussed above, a project or a development is normally proposed within the context of a broader planning document (*e.g.* the Official Plan, the Transportation Master Plan, the Infrastructure Master Plan). In other words, City Council or another planning authority already has considered the necessary balance between the different PPS policies and objectives, and determined that the most appropriate, primary use of the land in question is something other than natural heritage protection. Assuming that the proposed project or development is consistent with the broader planning document, then an EA or an EIS is unlikely to result in cancellation.

Nonetheless, EAs and EISs almost always result in changes to projects for the protection of natural heritage and wildlife. These changes can be very substantial, such as a change in the routing of a road or the layout of a subdivision to avoid natural areas and habitats. Or they may be smaller, but still important, such as the establishment and management of buffers and setbacks along natural areas and watercourses. Books can and have been written on the goals and methodologies for environmental assessments. The City of Ottawa has also produced guidelines for the preparation of environmental impact statements (http://www.ottawa.ca/residents/planning/dev_review_process/guide/environmental_impact/index_en.html). These guidelines contain explicit instructions for consideration and protection of wildlife and wildlife habitat during development.

In addition to its planning policies, the City has many other tools for the consideration and protection of natural heritage, including wildlife and wildlife habitat. These are covered more fully in *Document 3*. However, the Urban Tree Conservation By-law deserves particular mention, because of its broad applicability (http://ottawa.ca/en/licence_permit/bylaw/a_z/urban/). Within the urban boundary, the By-law requires a City permit for activities that could injure or destroy any tree over 50 cm in diameter, as well as any tree over 10 cm in diameter on properties greater than 1 ha in area. As part of the permitting process, the City requires information on natural vegetation communities and habitats, can require the retention of trees or forest cover where warranted, and can impose conditions on activities to minimize impacts on wildlife.

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Despite the extensive integration of natural heritage and wildlife protection into the City's planning practices, staff has identified a number of gaps or areas that could be improved (Table 1). Some of these are addressed by recommendations in other areas of this report, while others lie beyond the scope of this report.

Table 1: Gaps in Wildlife Planning Practices

Area of Concern	Suggested Actions	Implementing Authority
External Policy		
Integration of the City's natural heritage planning with natural heritage planning by the National Capital Commission (NCC), the Ministry of Natural Resources, and the City of Gatineau.	Continued consultation with the NCC, the Province and Gatineau on natural heritage system planning (*e.g.* Greenbelt Master Plan Review, Comprehensive Official Plan reviews).	City of Ottawa NCC City of Gatineau Province of Ontario
Compliance with the provincial *Endangered Species Act 2007*, and provision of City input into regulations under the ESA 2007.	Creation of a Species at Risk Biologist position or a Biologist position with responsibility for conformity with the *ESA 2007*. Addressed in the report recommendations.	City of Ottawa
Clarity for agency staff, other stakeholders and the general public as to "who does what"	Develop outreach and educational material with compendium of various roles and responsibilities of different levels of government/departments. Addressed in the attached Summary of Planning Practices and the report recommendations.	All levels of government and relevant authorities
Official Plan Policy		
Implementation of PPS Section 2.1 (Natural Heritage) with respect to protection of habitat of threatened and endangered species and other significant wildlife habitat relies upon identification of such habitat by the City, which is difficult given the current state of information with respect to detailed land cover and other habitat attributes. Similarly, monitoring and reporting on trends in protection of such habitat is not currently possible.	Expansion of the City's three-year cycle of aerial photography to include land cover classification and mapping. Monitoring and reporting on trends in habitat of endangered and threatened species and significant wildlife habitat, based upon the three-year cycle of land cover classification and mapping. This suggested action is not addressed in the Wildlife Strategy Report recommendations, but is under study by the Planning and Growth Management Department.	City of Ottawa (Planning and Growth Management/Infrastructure Services)

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Subwatershed studies are usually submitted for approval to Committee and Council without accompanying recommendations for resources to implement natural heritage protection and stewardship measures.	Submission of subwatershed studies for Committee and Council approval should be accompanied by a recommendation for a budget allocation to implement natural heritage protection and stewardship measures.	City of Ottawa (Planning and Growth Management)
Implementation Mechanisms		
No regulation for grading and altering sites in City.	Preparation of a Site Alteration By-law, as permitted in the *Municipal Act*. This suggested action is not included in the Wildlife Strategy Report recommendations, but is under study by the Planning and Growth Management Department.	City of Ottawa (Planning and Growth Management)
Parkland dedication through development does not typically include passive use or environmental lands.	Consider expanding parkland to include other forms of greenspace	City (Planning and Growth Management)

4. Wildlife Construction Protocol

In 2000, the Region of Ottawa – Carleton approved a Wildlife Construction Protocol for use during the review of development applications (Appendix A). This protocol provides a useful, overall approach to the mitigation of impacts on wildlife during construction, but is no longer consistent with the City of Ottawa's Official Plan policies and by-laws.

The Ottawa – Carleton Wildlife Centre has provided a construction protocol which it believes could provide the City and developers with more detailed and relevant suggestions on the mitigation of impacts to wildlife. Staff has modified the protocol slightly to better reflect the legal responsibilities and liabilities of the City (Appendix B).

The Ottawa – Carleton Wildlife Centre has not been able to identify the origin of the detailed construction protocol, and staff is unsure of its biological basis or feasibility. Consequently, staff cannot recommend adoption of the protocol at this time, but believe that it shows sufficient merit to warrant further study and consultation.

Recommendations

1. That the Planning and Growth Management update the construction protocol of the former Region of Ottawa – Carleton to reflect the City of Ottawa Official Plan and by-laws, including consideration of elements from the construction protocol provided by the Ottawa – Carleton Wildlife Centre, and bring the construction protocol to Planning Committee and Council for approval in the first quarter of 2013.

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2. That Planning and Growth Management incorporate the updated and approved construction protocol in the review of development applications and conditions of approval for plans of subdivisions and site plans.

5. Education and Outreach

Overview

As the governments closest to the day-to-day lives of their citizens, municipalities are the natural, first destination for people seeking information on wildlife. Many Canadian cities provide extensive information on wildlife, wildlife habitat and natural areas on their web pages. The City of Toronto's web site includes nine pages devoted to "Wildlife in the City", providing information on animal-proofing homes, deterrence of urban wildlife, and common urban wildlife species. Toronto also has a "Natural Spaces and Wildlife" page, with links to pages on that City's parkland and ravine system, community-based naturalization and stewardship programs, butterfly and bird habitat restoration projects, community gardens, and integrated pest management. Many cities also partner with educational institutions, stewardship groups, or naturalists' groups on public education and outreach programs. Examples include the City of Edmonton's partnership with MacEwan University on a "Master Naturalist Program", and the City of Vancouver's stewardship and educational partnership with the Stanley Park Ecology Society.

The City of Ottawa website includes one page entitled "Wildlife" and one page entitled "Having a problem with Wildlife?" Both pages rely on links to external agencies, such as the Ministry of Natural Resources, the Ottawa Humane Society, and the Ottawa – Carleton Wildlife Centre. The website could be made more relevant and use-friendly through the direct provision of information on wildlife, prevention of human – wildlife conflicts, and resolution of human – wildlife conflicts. The City's website also has a number of pages devoted to its natural heritage system, forests and trees, wetlands, urban greenspace, *etc*.... However, this information is presented almost exclusively in the form of links to outside websites, by-laws, reports, and planning documents. The presentation of this information a format that is easily accessed, immediately useful, and visually stimulating, could help to promote a greater public appreciation of Ottawa's outstanding natural character.

The City's Call Centre (311) staff can provide more detail in response to calls regarding wildlife. They can direct residents to relevant agencies, such as the Ontario Ministry of Natural Resources (OMNR), the Ottawa Humane Society (OHS), or Ottawa Public Health. They can also provide some limited practical advice on the prevention of human – wildlife conflicts. In some unusual cases, they may arrange for a knowledgeable staff person in the Land Use and Natural Systems Unit or By-law and Protective Services to contact the caller. Generally, however, the City does not respond to calls regarding wildlife, or human – wildlife conflicts, except in the case of an immediate threat to public health or safety (*i.e.* an aggressive animal, a large mammal in an urban area, a sick bat). Nor does the City operate any kind of education program regarding wildlife, urban wildlife habitat, or natural heritage.

Public interest extends not only to general questions regarding wildlife, but to the extent and nature of the City of Ottawa's own wildlife management activities. Residents regularly express interest in the way that the City considers wildlife in planning processes, manages wildlife on City properties, or prevents

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and resolves conflicts between wildlife and municipal infrastructure. This information is not easily obtained, because of the decentralized way in which the City conducts wildlife management activities.

It has become clear from the volume of calls to Ottawa's City Councillors and the Mayor's office, from local news stories, and from comments in a variety of public forums, that the information provided by the City regarding wildlife does not meet public expectations. The public appetite for information is currently being filled by a number of sources, some of which offer distinctly contrasting opinions and advice. Difficulties in obtaining information on the City's own wildlife management practices also tend to create speculation, suspicion, and distrust of some City departments and staff. The City's commitment to service excellence would benefit from increasing the amount, relevance and accessibility of wildlife information that it provides.

Just as important, the City is missing opportunities to promote its outstanding natural character, both at home and elsewhere. How many residents of Ottawa know that moose live within a fifteen minute drive of Ottawa City Hall, or that Lac Deschênes is recognized as a globally significant bird area, or that 52 species at risk can be found within the City's boundaries? How many of Ottawa's visitors or potential visitors know that they can paddle past turtles and herons on the shores of the idyllic Mississippi River or the Morris Island Conservation Area, fish for muskellunge within walking distance of Parliament Hill, picnic and pick berries on the Carp Hills Rock Barrens, or identify the winter tracks of fishers and otters in the woods and wetlands of the Marlborough Forest? Ottawa is blessed with an abundance of wildlife in their natural habitats, easily accessible to the public, of which it could and should boast.

City Website

The wildlife section on the City's website should be expanded and revised to provide detailed information on common urban wildlife species, best practices for prevention of human – wildlife conflicts, and options for resolution of human – wildlife conflicts. It should retain existing links to outside resources, while more clearly identifying responsible agencies. It should include information on the species at risk most likely to be encountered by residents. It should include information on the risks and prevention of animal-transmitted diseases. It should also include a summary of the City's approach and practices with respect to wildlife planning and wildlife management around City property and infrastructure.

The City's website should also be expanded to include more information on the City's natural areas and outdoor recreational opportunities. Such a section could provide an exciting opportunity for public engagement through incorporation of "wiki" technology or other social media technology, allowing people to describe their own favourite natural areas, to report on wildlife sightings, or to post their own photographs.

Urban Wildlife Speaker Series

Staff recommends a one year trial of an Urban Wildlife Speaker Series, consisting of four evening presentations over the course of 2012 – 2013 (autumn, winter, early spring, early summer). The presentations would feature experts on urban wildlife and wildlife issues, discussing their own work within the general paradigm of co-existence and conflict prevention. Each evening would provide staff with an opportunity to promote public awareness of seasonal wildlife issues. Depending upon the

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location, the City might invite other organizations, agencies and private service providers to set out information materials and displays.

Issues of human – wildlife conflict arise at predictable times of the year. From early spring until mid-summer, many homeowners must contend with raccoons, squirrels and skunks searching for warm, safe environments in which to bear and raise their young. In autumn, deer and moose begin to disperse, increasing the risks of automobile collisions and incursions into urban environments. Bats move into attics, looking for winter hibernation sites. In mid-winter, coyotes become more visible as they travel more widely for food, and congregate to breed. Just as predictably, the same questions and concerns arise each year, from residents looking for more information on the prevention and resolution of conflicts.

The City of Ottawa should provide seasonal information to residents through the banner on its main web page and through public service announcements. However, in the competition and cacophony of new and old media, such information would likely receive minimal attention from residents, unless accompanied by some distinguishing element. An annual, Urban Wildlife Speaker Series, sponsored by the City, could help to generate interest by media and residents, as well as convey seasonally relevant information.

The cost of such a speaker series would be low. The organizational requirements would be minimal and could be met by existing staff.

Primary School Education and Outreach

Staff recommends that the City approach *Let's Talk Science* at the University of Ottawa and Carleton University to partner on the development and delivery of an educational kit for primary schools on urban wildlife. The focus of the kit would be urban biodiversity, urban species and urban habitats. However, the kit should include information on urban wildlife and safety, including instruction for children on how to react to wild animals.

Research and experience shows that parental fears for the safety of children around urban wildlife – including coyotes – are largely unwarranted. Nonetheless, caution around wild animals is always wise. And whether warranted or not, parental concerns can escalate to the point where the City must react to calm community fears. In contrast, an understanding of the real hazards, and knowledge of how to respond to them, can lead to less fear and even appreciation of urban wildlife. Development and delivery of an education kit on urban wildlife would allow the City to address parental fears, while reframing the issue in a positive way.

Let's Talk Science in Ottawa appears to be an appropriate partner for the City (http://letstalkscience.ca/ottawa.html). *Let's Talk Science* describes itself as, "...part of a national outreach program that supports educators in teaching science to children and youth." Nationally, the program involves 3000 post-secondary student volunteers and reaches 145,000 children and youth every year. The Ottawa program is coordinated by Dr. Barbara Vanderhyden of the University of Ottawa, with the assistance of three graduate student coordinators at the University of Ottawa and two graduate student coordinators at Carleton University. 225 volunteers from both universities deliver hands-on science workshops and other activities to 10000 local children and youth every year in classrooms and other venues. Activities cover all areas of science and engineering, and they are

carefully aligned with the Ontario school curriculum to be of greatest usefulness and appeal to the participating schools and teachers.

Dr. Vanderhyden has indicated that *Let's Talk Science in Ottawa* would be willing to work with the City of Ottawa on an urban wildlife education activity kit, and would be willing to include the kit in its outreach program to local schools and teachers. The costs to the City would likely be an initial expense for the development of the kit and an annual contribution to the program coordination costs: approximately $7,500 in the first year, and then approximately $2,500 each year that the kit is in use.

Recommendations

3. That the wildlife section on the City's website be expanded and revised to provide detailed information on common urban wildlife species, best practices for prevention of human – wildlife conflicts, and options for resolution of human – wildlife conflicts.
4. That the City's website should also be expanded to include more information on the City's natural areas and outdoor recreational opportunities, making use of "wiki" technology or other social media technology to provide for an interactive public forum.
5. That the City initiate a one year trial of an Urban Wildlife Speaker Series, consisting of four evening presentations over the course of 2012 – 2013 (autumn, winter, early spring, early summer).
6. That the City approach *Let's Talk Science* at the University of Ottawa and Carleton University to partner on the development and delivery of an educational kit for primary schools on urban wildlife.

6. Nuisance Wildlife

Urban and suburban environments provide excellent habitat for many of common animals, especially squirrels, raccoons, striped skunks, groundhogs, big brown bats, and several species of birds. These environments provide shelter, food, and protection from predators. In fact, because of the high availability of suitable habitat and food, densities of these animals are much higher in urban and suburban environments than in natural environments. However, they can become a nuisance, and residents often find themselves searching for answers and solutions.

Like a weed, a nuisance animal is simply an organism in the wrong place at the wrong time. In most cases, humans and urban wildlife coexist happily. However, conflicts can arise. Raccoons, squirrels, birds and bats may take up residence in attics, walls or chimneys, where they can cause significant damage and expense for homeowners. Striped skunks may take up residence under porches or decks, ready to surprise the unwary homeowners or their curious pets. Gardens may suffer the depredations of animals in search of a free meal or a feast of grubs. Waterfront parks may become overrun with large, noisy flocks of Canada geese that aggressively seek handouts from park users and leave enormous quantities of faeces in their wake.

Fortunately, conflicts with nuisance wildlife are easily preventable. The screening of entry points, the elimination of food sources, the maintenance of fencing, and simple deterrents can protect property from urban wildlife. Information on such techniques is available from many sources, including the Ottawa – Carleton Wildlife Centre and the Ottawa Humane Society. Qualified wildlife service providers are also available to assist residents to take preventative measures.

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Most urban animals have a primary den and several secondary den sites, which they may use in response to a variety of circumstances (e.g., disturbance near the primary den, changing weather conditions, birth and growth of offspring, overabundance of fleas or other parasites). Exclusion of an animal from a primary den will normally result in its relocation to a secondary den.

Private Property

Neither the Ontario Ministry of Natural Resources nor the City responds to conflicts with nuisance animals on private property. Prevention and response to conflicts with nuisance animals is the responsibility of property owners.

When nuisance animals have already established themselves in or around a home, residents have two main choices.

- *Do It Yourself*. If the animals pose no immediate threat to health and safety, then residents may choose to wait until the adults and any young have left the home, and then close the access point to prevent re-entry. Residents taking this approach must ensure that all young animals have left the nest or den, which normally means waiting until the young are weaned. The Ottawa – Carleton Wildlife Centre provides practical advice for residents choosing to take this approach. However, the City advises that residents seek professional advice and assistance in any subsequent clean-up of areas or materials contaminated by animal faeces or urine.
- *Get a Professional.* Residents may choose to seek the assistance of a qualified wildlife service provider to resolve the conflict. In general, wildlife service providers will take one of three approaches (or a combination thereof).
    - *No trapping*. Some service providers will not trap animals except as a last resort. Their preferred approach is to install one-way doors at access points to allow animals to leave the building, but to prevent re-entry. Once the animals have left the building, the service provider will seal the access point. If practical, these service providers may recommend that residents wait until young animals have weaned before taking action. If not practical, then the service providers will physically remove any young animals and place them in protected boxes near the access site for the adult animal to retrieve and relocate.
    - *Live trapping.* Some service providers will trap and release animals. The release point is usually near the access point. If the removal is necessary during birthing and nesting season, then service providers will physically remove any young animals and place them in protected boxes near the access point for the adult animal to retrieve and relocate.
    - *Lethal trapping*. Some service providers will use lethal trapping or live trapping in combination with euthanasia. If the removal is necessary during birthing and nesting season, then the service providers will physically remove and euthanize any young animals.

The City of Ottawa has prepared a protocol for use by the City Call Centre (311) in helping residents to determine the appropriate course of action when dealing with nuisance animals. In the case of bats or sick animals in the home, residents should always seek professional advice and assistance. This protocol should be made available on the City's website.

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Contact with animal faeces and urine can result in the transmission of diseases to humans (see "Animal-Transmitted Diseases"). The City recommends that residents seek professional advice and assistance in the clean-up of any areas or materials contaminated by animal faeces or urine.

The Ottawa Humane Society (OHS) has developed a list of questions which they recommend that residents ask when seeking a qualified wildlife service provider. These questions and the answers recommended by the OHS as most appropriate are reprinted in Appendix D and should be made available on the City's website.

City Property

The City relies on professional wildlife service providers for management of nuisance animals on its property. Prevention and co-existence is always the City's preferred option. For existing conflicts, the City's approach depends upon the circumstances. For wildlife in buildings, the City's service providers use a no trapping or live trapping approach. For wildlife in parks, open spaces and infrastructure facilities, the approach depends upon the context and the degree of risk to public health and safety. For example, the City has engaged in experimental "hazing" of geese to discourage them from using some parks. In some situations, where the presence or actions of an animal pose a risk to public health and safety, the City's service providers will use lethal trapping.

Forestry Operations and Tree Removal

The Forestry Services Branch is often called upon to trim or remove trees on City property, particularly in urban and suburban areas. Until recently, tree removals have generally occurred singly, where individual trees have suffered decline or damage, or where trees may be affecting nearby structures. More recently, however, Forestry Services has had to remove large numbers or groups of trees in response to clusters of infections by Emerald Ash Borer.

Forestry Services does not trim or remove trees containing adult animals or nests/dens containing young animals. During the initial inspection of trees proposed for removal, Tree Inspectors make note of any evidence of animal use or potential for animal habitat. They pass this information along to the crew assigned to the tree removal. When the tree removal crew arrives at the tree, they also inspect it for adult or juvenile animals. If the crew finds animals in the tree, then they leave it undisturbed and move on to the next tree. The crew will not return to work on the occupied tree until both the adults and juveniles have left. This procedure applies regardless of whether Forestry Services is removing one or many trees.

Species at Risk and Private Property

Of the many species at risk found in the Ottawa area, a small number may actually make their homes in or on buildings or other structures. Three species in particular may be of concern to residents: the chimney swift, the common nighthawk and the barn swallow. All three of these species eat flying insects, and may be seen swooping through the skies in pursuit of their prey. They are often most active at dusk or early in the morning, when insects tend to swarm.

The chimney swift, as its name suggests, nests in open chimneys during the summer months. Chimney swifts are classified as "threatened" under the federal *Species at Risk Act* (SARA) and Ontario's

Endangered Species Act, 2007. Under those laws, chimney swifts and their habitat are protected from destruction or disturbance, including nesting sites on private property. The birds and their nests are also protected under the federal *Migratory Birds Convention Act*, which also applies to many of our other native birds regardless of whether or not they are "at risk." Property owners considering the demolition, renovation or capping of chimneys with existing or recent chimney swift nests should consult with the Species at Risk Biologist in the Kemptville District Office of the Ministry of Natural Resources before proceeding. In addition, the Ottawa Stewardship Council is conducting a survey of chimney swift nesting sites in Ottawa, and it can provide information to property owners on appropriate conservation and stewardship measures.

The common nighthawk will sometimes nest on gravel-covered, flat roofs, which are often found in industrial areas and older neighbourhoods in Ottawa. The common nighthawk is classified as "threatened" under SARA and as "special concern" under the *Endangered Species Act, 2007*. Under SARA and the *Migratory Birds Convention Act*, common nighthawks and their nests are protected. Property owners considering the demolition or renovation of buildings with existing or recent common nighthawk nests should consult with the Species at Risk Biologist in the Kemptville District Office of the Ministry of Natural Resources before proceeding.

Barn swallows build cup-shaped nests of mud on vertical surfaces, such as walls or bridge supports. They are often found nesting on barns and other farm buildings (including houses). The barn swallow is classified as "threatened" under the *Endangered Species Act, 2007* and as such it and its habitat are protected from destruction or disturbance. The birds and their nests are also protected under the *Migratory Birds Convention Act*. Property owners considering the demolition or renovation of buildings with existing or recent barn swallow nests should consult with the Species at Risk Biologist in the Kemptville District Office of the Ministry of Natural Resources before proceeding.

The City suggests that wildlife service providers and general contractors familiarize themselves with the laws protecting chimney swift, common nighthawk and barn swallow, as well as options and best practices for protection of nesting sites.

7. Species at Risk and the City of Ottawa

Ottawa is a "hot spot" for species at risk, with as many as 52 species known or suspected to occur in the area as of January 2012. Of these, 29 species are protected as "threatened" or "endangered species" under the provincial *Endangered Species Act, 2007* (ESA) and the policies of the *Planning Act*. Five additional migratory birds are protected as "threatened" species under the federal *Species at Risk Act* (SARA).

Under the Provincial Policy Statement, 2005 (PPS) and the City's Official Plan (OP), development and site alteration are prohibited in "significant habitat for endangered and threatened species, as approved by the Ministry of Natural Resources." The OP also requires that any development application for property within 120 m of significant habitat for endangered and threatened species be accompanied by an Environmental Impact Statement showing that the development will have "no negative impact" on that habitat. However, these protections only apply in the context of the municipal planning and development approval process. The City has no jurisdiction or responsibility outside of this process regarding species at risk or their habitat on private property. Furthermore, should a development

proponent succeed in obtaining a permit from the Minister of Natural Resources under the ESA to remove habitat of an endangered and threatened species, then such a permit would also have the effect of removing protection of significant habitat under the PPS and the OP.

The City does have its own responsibilities for protection of species at risk and habitat for species at risk under the ESA and SARA as a landowner and a proponent of projects. These responsibilities most often arise in the context of municipal infrastructure projects, maintenance activities and operational activities. For example, regardless of any environmental assessment process, the City must obtain permits from the Minister of Natural Resources under the ESA for any infrastructure work that would damage or destroy habitat of an endangered or threatened species. Similarly, any maintenance work in or around water, such as the replacement of culverts or the repair of bridge crossings, has the potential to affect turtles, most of which enjoy some status under the ESA or SARA. Where provincial species at risk are an issue, the Ministry of Natural Resources can issue stop-work orders for projects proceeding without the necessary permits under the ESA, and the corporate penalty for contravention of the ESA can be as much as $1,000,000 for each individual violation.

As with wildlife issues in general, the City does not have any staff with the formal responsibility or resources for ensuring compliance with the ESA. The situation is aggravated by the rapidity with which new species and their habitats gain protection under the Act. The Province reviews and updates its list of endangered and threatened species approximately twice per year, and new additions are frequent. Staff have taken it on themselves to track and update the City's list of species at risk and to post that list to the City's intranet. As time permits, they have also attempted to disseminate information on species at risk and compliance with the ESA. However, this *ad hoc* approach is not consistent or adequate, and the City has experienced several "near misses" with respect to the ESA, which have resulted in warning letters from the Ontario Ministry of Natural Resources.

Staff in the Land Use and Natural Systems Unit currently devote the equivalent of approximately ½ of an FTE to species at risk issues. This is more than they can spare without impacting other planning responsibilities, and less than required to ensure compliance with the ESA. Staff believes that due diligence by the City requires creation of a new position with formal responsibility for compliance with the ESA (see Recommendation # 11, Creation of City Wildlife Biologist Position).

8. Large Wild Mammal Emergency Response

Ottawa is fortunate to have large, high quality natural areas adjacent to and within its urban boundary. Many of these areas remain well-connected to the greater rural and natural landscape, providing for the movement and sustenance of wildlife. In general, the citizens of Ottawa value the easy access to these natural areas and the opportunities for wildlife observation that they provide. However, these natural areas can also provide access by wildlife to urbanized areas. In the case of some large mammals, particularly black bears, white-tailed deer and moose, their movement into the urban landscape may from time to time pose immediate threats to public safety and their own well-being.

In such instances, public safety must take precedence over the well-being of wildlife. Fortunately, these incidents are very rare and usually resolve themselves, as the animals retreat back into natural areas to avoid human contact and disturbance. In some cases, however, large wild animals may be unable to find their way back to natural areas quickly or without creating a public hazard. Intervention by the City

then becomes necessary to protect public safety. Intervention is also necessary to reduce the risk to the animals themselves, who can be subject to extreme physical stress and to injury during movement through an unnatural and unfamiliar landscape.

The City's first responsibility when large mammals appear in suburban and urban areas is to remove any direct threat to public safety. The Ottawa Police Services will respond to any reports, assess the situation on site, and take any immediate action necessary to prevent injury to the public. In almost all cases, Ottawa Police will isolate the area in which the animal is located, as well as any obvious path for the animal back to natural habitat. For animals on Federal property, the Ottawa Police will call the National Capital Commission, which will respond with its own Conservation Officers. For animals on private property or City property, the Ottawa Police will contact a staff person in By-law and Regulatory Services who is on-call 24 hours a day, 365 days a year to assess incidents and determine the appropriate course of action. This may include assisting Police to encourage the animal to move back to its natural habitat on its own if it is able to do so, or contacting the City's Wildlife Service Provider who is contracted to provide emergency wildlife conflict resolution services and who is also on-call 24/7.

The City's Wildlife Service Provider is trained and equipped to provide any level of response. Once public safety has been assured, the primary concern of the service provider is the welfare of the deer, moose or bear. If practical, the service provider will work with the Ottawa Police to direct the animal toward the nearest, suitable natural habitat. If such an approach is not practical, or if the animal appears at risk from physical stress (which can be fatal to deer and moose), the service provider may tranquilize and then transport the animal. However, tranquilization is not without risk. Animals under stress may suffer fatal reactions to the tranquiller, and tranquillization is often not effective on very excited animals, except at near fatal dosages. As a last resort, when the service provider believes that attempts at tranquillization will increase the suffering of the animal or risk to public safety, then the service provider will shoot the animal. This approach has been reviewed and supported by the Ontario Ministry of Natural Resources. Since implementation in 2010, it has proven effective at resolving most large wild mammal incidents without harm to the animals or significant public disturbance.

The cost for implementation of the large wild animal emergency response program has been approximately $30,000 *per* year, which By-law and Regulatory Services has met through its existing budget.

At present, management and coordination of the City's large wild mammal emergency response protocols and associated on-call services are provided by a staff person in By-law and Regulatory Services on a voluntary and informal basis, in addition to her normal duties. In the long-term, such an *ad hoc* approach this situation is not sustainable, depending as it does on a willing individual rather than a defined staff position with the appropriate role and responsibilities. Therefore, staff recommends the creation of a new City Wildlife Biologist position, with responsibility for large wild mammal emergency response program (see Recommendation # 11, Creation of City Wildlife Biologist Position).

9. Beaver Management

More than 200 years ago, commercial trapping almost eliminated beavers from the Ottawa Valley. Although we do not have documentation of the changes to the landscape resulting from their loss, we can reasonably assume that it would have significantly decreased the amount of wetland. Subsequently,

much of the landscape of Ottawa was further transformed by forestry, European settlement, agriculture and urban development. Much of the land was drained and cleared for farming; rivers and streams were dammed; mills were constructed; villages and roads were built.

Beginning in the early- to mid-Twentieth Century, changing socio-economic conditions led to the gradual abandonment of many homesteads and marginal agricultural areas, resulting in extensive regeneration of Ottawa's (and eastern North America's) forest cover, as well as the abandonment and disrepair of many agricultural ditches and drains. About the same time, beavers began to re-colonize the Ottawa area. With increasing opportunities for forage, a general absence of large predators, and a network of natural and man-made watercourses to exploit, beavers have quickly spread and become well-established in the City.

Overall, the re-establishment of beavers is good for Ottawa. Ecological research has shown that beavers provide great benefits through the promotion of biodiversity, increases in ecosystem health and resilience, and provision of ecosystems services – especially through the creation and maintenance of wetlands. However, they also cause damage to private property, loss of economically-productive woodlots and agricultural land, and impairment of municipal infrastructure.

Private landowners have the right to manage beavers on their own properties, including trapping and the breaching of beaver dams. Such activities are regulated by the Ministry of Natural Resources and the Conservation Authorities. Both agencies provide outreach and educational materials on alternatives to trapping. In most cases, the City has no role or responsibility in beaver management on private lands.

Municipal Drains are an exception to this general rule. In Ontario, municipalities have the responsibility for implementation of the provincial *Drainage Act*. This Act provides a mechanism by which private landowners can request that a municipality provide and maintain drainage of private lands. Such requests are subject to review and approval by municipal Councils, but Council decisions can also be appealed to the Ontario Drainage Tribunal and the Ontario Drainage Referee. Under the *Drainage Act*, municipal Drain Superintendents are required to maintain municipal drains free from obstruction, which often includes beaver dams. Works authorized under the *Drainage Act* are not subject to Provincial planning policies for the protection of significant wetlands, although such works can and often do include measures for the protection of wetlands.

In addition to the requirement for maintenance of municipal drains, the City is sometimes required to carry out beaver management activities for the protection of physical infrastructure, especially roads. Road culverts and bridges are favoured places for beavers to build dams, creating natural choke points on watercourses and providing strong auditory triggers for dam-building activities. Beavers tend to build much higher dams at culverts than under normal circumstances. The resulting beaver ponds can cause both flooding and physical damage to road beds, creating public safety hazards and requiring expensive repairs.

Beavers are also sometimes attracted to engineered stormwater facilities, especially those that have been designed to function as attractive, public spaces. In most cases, beavers do not linger in these facilities, but quickly move to more suitable, natural habitats. In some cases, however, beavers try to establish lodges and/or dams, sometimes within the associated stormwater pipes. Such activities impair the functioning of these stormwater facilities, creating risks to both public and private property, especially in large storm events. Beavers also damage or destroy neighbouring trees, which have often been planted by the City at the cost of many thousands of dollars.

The City has relied primarily (although not exclusively) on lethal trapping and dam removal to manage beavers. It does so only in municipal infrastructure, where and as necessary to protect public health, public safety and private property. The City does not conduct general beaver population management. In 2011, the City trapped approximately 134 beavers, broken down as follows:

- Road culverts and bridges: 71 beavers in 24 locations;
- Municipal drains: 57 beavers (number of locations not recorded);
- Stormwater facilities: approximately six beavers (number of locations not recorded).

To put these numbers in perspective, Ottawa is 2800 km^2 in area. It has approximately 6500 culverts and bridge crossings, mostly in the rural areas. It has 1200 km of municipal drains and 103 engineered "wet pond" stormwater facilities. Using the 2011 information, annual beaver trapping rates by the City were:

- Total area: one trapped beaver for every 21 km^2.
- Road culverts and bridges: 0.4% of locations;
- Municipal drains: one trapped beaver for every 21 km of drain;
- Stormwater facilities: less than one trapped beaver for every 17 wet ponds.

The City employs trappers licensed by the Ontario Ministry of Natural Resources (OMNR) to trap beavers, using the recommended tools and methods. For several reasons, the OMNR does not recommend live trapping of beavers. First, relocation of live-trapped beavers is not practical or humane, because of Provincial restrictions on animal relocation beyond 1 km, and because of territorial behaviour by beavers. Second, euthanasia of live-trapped beavers is difficult and hazardous due to their large size and considerable strength. The only practical form of euthanasia of beavers is shooting, and the discharge of firearms for such purposes in urban, suburban and peri-urban areas is not acceptable for many reasons.

In the past, the City has investigated and employed alternative, non-lethal beaver management tools and techniques for the protection of municipal infrastructure. There are three general types of tools, all of which are commonly referred to as "beaver deceivers":

- *Beaver fences* are in-water barriers that prevent beavers from accessing and constructing dams at culverts, bridge crossings, or other choke points. Newer models of beaver fences employ shapes and designs which are easy to maintain and highly resistant to obstruction by beavers.
- *Pond levellers* are rigid or flexible pipes installed within and through beaver dams that maintain beaver ponds at water levels that do not pose a threat to property or infrastructure.
- *Diversion dams* are always employed with beaver fences or pond levellers. They are partially man-made, constructed upstream of existing beaver dams, at locations and elevations that do not pose the same risk to property or infrastructure. Upon removal of existing, problematic beaver dams, the diversion dams provide preferential sites for reconstruction by beavers.

Several studies have looked at the effectiveness of beaver deceivers as alternatives to trapping and dam removal for managing the impacts of beavers on infrastructure. The studies suggest that beaver deceivers can provide cost-effective protection of infrastructure under many conditions, especially at road and railway culverts. Locally, the National Capital Commission relies almost entirely on beaver

deceivers for protection of infrastructure in Gatineau Park, although it relies mostly on trapping in the Greenbelt. However, all of these studies conclude that beaver deceivers may not be effective under some circumstances, and that they may need to be supplemented by trapping prior to installation (Langlois and Decker 2004; Callaghan 2005). In particular:

- beaver deceivers may not be effective in watercourses with straightened channels and low grades, where beavers can easily build new dams upstream or downstream;
- beaver deceivers are susceptible to ice damage;
- beaver deceivers normally result in small water level increases, making them unsuitable for "zero tolerance" locations;
- beaver deceivers are not suitable for locations with large catchments or rapidly changing flows.

Overall, beaver deceivers are most suitable for locations on minor natural watercourses, where the goal is to reduce the threat to infrastructure, while maintaining the ecological benefits provided by beavers and beaver-created wetlands.

Stormwater Facilities

Staff does not recommend the use of beaver deceivers in engineered stormwater management facilities. Instead, City staff recommends continuation of the current practice of beaver trapping on an "as needed" basis in these facilities.

Engineered stormwater facilities are designed and built to protect property, infrastructure and aquatic systems from the effects of contaminants, flooding and erosion. Beaver deceivers have the potential to change the hydrological and operating characteristics of these facilities in unpredictable ways, through their own effects on water flows, through their interactions with winter ice, and through interaction with beaver activities. Staff was able to find only two instances where beaver deceivers have been installed in engineered stormwater facilities. There may be other examples, of which staff is not aware.

Peterson Pond, in King County, Washington State, is an on-line facility, consisting of a nine acre, natural pond on a salmon stream, with a weir, a control structure and a fish ladder (http://www.kingcounty.gov/environment/animalsAndPlants/beavers/solutions/control.aspx, last verified May 18, 2012). The control structure was retrofitted in a beaver fence in 2001, following repeated damming by beavers. The Goodman Creek Stormwater Pond in Oshawa, Ontario is another on-line facility. Originally designed as a quantity control pond (i.e. a dry pond) with a low flow channel, the pond had developed into a marsh following damming of the outlet structure by beavers. In order to restore the functioning of the facility, while protecting the biodiversity functions of the new marsh, the facility was retrofitted with a pond leveller in 2011 to maintain an acceptable water level (Brian Henshaw, *pers. comm.)*. Neither of these examples represents the majority of Ottawa's stormwater ponds, and in neither case has there been long-term monitoring of the effectiveness of the beaver deceiver. In the case of the Goodman Creek Stormwater Pond, the installation of the pond leveller required a full hydrological re-analysis of the facility to evaluate the risks and to identify an acceptable water level (Brian Henshaw, *pers. comm*.).

It has been argued that installation of beaver deceivers in engineered stormwater facilities could reduce flooding risks, because they would provide continuous protection of the facility, rather than intermittent

protection provided by inspections and trapping. This argument assumes that the beaver deceivers would be effective in stormwater facilities, which staff disputes, and that staff do not regularly inspect stormwater facilities. In fact, the staff of the Stormwater Management Section estimate that most facilities receive some form of inspection weekly, and that problematic locations receive more frequent inspections during critical times of the year.

In summary, City stormwater engineers believe that the use of beaver deceivers in engineered stormwater facilities could compromise the functioning of those facilities and does not constitute good engineering practice. Staff of the Land Use and Natural Systems Unit agree that the small number of beavers trapped in stormwater facilities each year does not justify a change to the City's management of these facilities, particularly considering the risks, challenges and expense of doing so.

Municipal Drains

Staff does not recommend the widespread use of beaver deceivers in existing municipal drains. Instead, staff recommends the current practice of beaver trapping on an "as needed basis".

However, staff does recommend further evaluation of the potential effectiveness of beaver deceivers, beginning with the demonstration project described below. Staff recommends that Drain Engineers consider the results of that evaluation in identifying opportunities for the use of beaver deceivers at suitable locations on new municipal drains, or where Municipal Drain reports are being revised, especially in conjunction with the protection of wetlands.

By their nature, municipal drains are not normally conducive to the use of the beaver deceivers. The purpose of a municipal drain, or any agricultural drain, is to increase and to speed the movement of surface water off poorly-drained land. Consequently, drains tend to occur on lands with very low grades, where natural drainage is slow. Furthermore, the construction and maintenance of municipal drains often includes the straightening of channels and the elimination of natural restrictions. In doing so, they tend to create the conditions in which beaver deceivers are least effective: i.e. where beavers can most easily relocate dams upstream or downstream, and where even minimal water level increases can result in the flooding of substantial areas.

In addition to the physical constraints, there are also legal restrictions on the use of beaver deceivers in municipal drains. Unless the supporting Drain Engineer's report explicitly provides for the retention or tolerance of a beaver deceiver and/or a beaver dam in a municipal drain, then such structures could be considered "obstructions" under the *Drainage Act*. Creation of such an obstruction, or failure to remove an obstruction, can lead to action against the City by the affected landowners. Re-opening a Drain Engineer's report to add provisions for a beaver deceiver requires the agreement of the affected landowners. Practically, therefore, the best opportunity to incorporate beaver deceivers into a municipal drain comes at the time of preparation of the original Drain Engineer's Report. Even then, dissenting landowners could appeal such provisions to the Ontario Drainage Tribunal and the Ontario Drainage Referee.

Nonetheless, the City is adapting its municipal drain practices to attempt to protect wetlands, while still meeting the obligations of the *Drainage Act*. In a recent example, a Drain Engineer's report incorporated the use of a water control structure to protect the core area of a provincially significant wetland, while still relieving flooding on adjacent properties. It is feasible that beaver deceivers could be effective in the same way, allowing retention of beaver ponds at suitable locations on municipal

drains, but at reduced water levels which minimize impacts on productive forests and fields. Each case would need to be assessed individually.

Road and Rail Culverts

Staff recommends further study and evaluation of the potential effectiveness of beaver deceivers at problematic road and railway culverts, beginning with the demonstration project described below.

Past studies and local experience suggests that beaver deceivers can have the greatest success and benefit at road and railway culverts. Roads and railways are relatively resilient to adjacent beaver activity, except when water elevations become high enough to cause flooding, to pose a roadside safety hazard, or to threaten the integrity of the road/rail bed. Unfortunately, culverts provide very strong triggers for dam building behaviour by beavers, frequently resulting in the construction of much higher dams than under natural circumstances. Beaver deceivers can have a high success rate in such circumstance, by preventing access to the culverts by beavers (beaver fences), by redirecting the beaver activity away from the mouth of the culvert (pond levellers and diversion dams), or by a combination of both methods.

The cost of installing beaver deceivers at culverts is higher in the short-term than trapping. However, long-term costs are normally lower, and the potential for expensive structure damage to culverts and road/rail beds is reduced. The City recently has installed beaver deceivers at two locations for the protection of culverts: at a railway culvert in the South March Highlands Conservation Forest, and at a railway culvert along the Osgoode Trail.

Beaver Deceiver Demonstration Project

The City has evaluated the effectiveness of beaver deceivers in the past, with generally unsatisfactory results. However, the design of beaver deceivers has improved in recent years, as have techniques in site evaluation and installation. Staff has initiated the establishment of seven demonstration sites of the use of beaver deceivers, focused on low-risk road/rail culverts and natural watercourses.

As discussed above, the City already has installed beaver fences at a culvert under the Osgoode Trail and at a culvert under the railway line in the South March Highlands. In addition to these sites, staff has identified another five sites suitable for the installation of pond levellers, fencing and/or diversion dams. These are low risk locations, where the potential failure of the beaver deceivers poses a minimal threat to property and infrastructure, and no threat to public safety. The cost for establishment of the five additional demonstration sites is estimated at $15,000. The Surface Water Services Management Branch is funding the project from its existing budget, with staff from the Land Use and Natural Systems Unit providing technical support and project management.

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Figure 1. South March Highlands Demonstration Site

Figure 2. Osgoode Trail Demonstration Site

Staff will monitor the demonstration sites for one to three years, depending upon the results. The monitoring will include tracking of maintenance requirements and costs, for comparison to locations using standard management practices (i.e. trapping). Monitoring will be done using current resources and within existing budgets.

Recommendations

7. That the City evaluates the potential effectiveness of beaver deceivers, beginning with the demonstration project currently underway.
8. That the Municipal Drainage Section consider the results of the evaluation in identifying opportunities for the use of beaver deceivers at suitable locations on new municipal drains, or where Municipal Drain reports are being revised, especially in conjunction with the protection of wetlands.
9. That the Public Works Department consider the results of the evaluation in its maintenance program for road and railway culverts.

10. Coyotes

Over the past 200 years, coyotes have dramatically expanded their range into eastern North America, probably as a result of the eradication of competing gray wolves and creation of suitable habitat for both coyotes and white-tailed deer by agriculture and rural landscape changes (Gompper 2002). They are now found in and around every urban area in eastern North America, having been captured even in New York's Central Park (Gompper 2002). In Ottawa, coyotes are ubiquitous in rural areas, and they are commonly encountered by residents in villages, suburban areas, the National Capital Greenbelt, and even some urban areas. As apex predators, coyotes perform important ecosystem functions. They provide control on populations of small mammals, particularly rodents (including beaver), and can help to provide stability in the composition and numbers of general wildlife populations (Voigt and Berg 1999, Gompper 2002).

Coyotes are recognized as a threat to livestock in rural areas. Farmers who lose livestock to coyotes are eligible for compensation under the Ontario Wildlife Damage Compensation Program, which the City administers on behalf of the province. The presence of coyotes in villages, suburbs and urban areas has also caused concerns for some residents, who wonder if the animals pose a threat to family pets and children. Questions have been raised about the City's role and responsibility in responding to these concerns, and whether the City should take a more active approach to managing the coyote population within its boundaries. At present, the City only responds to reports of coyotes where aggressive behaviour by an animal appears to pose an immediate threat to public safety.

The numbers of coyote conflicts in Ottawa appear relatively stable, based upon livestock compensation claims by farmers and reports to the Ontario Ministry of Natural Resources. Between 2006 and 2011, the number of claims for livestock compensation varied between 75 and 130, with a peak in 2009 (Table 2). The peak coincided with a dramatic decline in the local white-tailed deer population (one of the primary prey for coyotes), following two hard winters. Similarly, the Kemptville District Office of the OMNR reports that public complaints regarding problem coyotes continue to average approximately 10 *per* year, with no apparent trend or pattern in the calls (Beverly McCreight, Area Manager, *pers comm.*).

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Table 2. Livestock Compensation 2006 – 2011

Year	Compensation Claims
2006	75
2007	85
2008	98
2009	130
2010	102
2011	98

Data from the City of Ottawa Rural Affairs Office

Studies of urban coyotes show that the majority of animals seek to avoid confrontations with humans (White and Gehrt 2009). A comprehensive survey by researchers found that in the 46 years between 1960 and 2006, there were 142 documented cases of injuries to humans by coyotes, mostly in the western United States (White and Gehrt 2009). There are only two recorded fatalities. In comparison, there are approximately 350-400 reported incidents of injuries to humans by domestic dogs in Ottawa annually. Nonetheless, White and Gehrt (2009) found that the rate of aggressive behaviour by coyotes appears to be increasing – a trend which they attributed to increasing habituation to humans and human environments by coyotes.

Wildlife research staff for the Ontario Ministry of Natural Resources has provided the City with the following comment:

> *"It is unusual for coyotes to show no fear of humans. Coyotes displaying no fear of humans or exhibiting aggressive behaviours have likely been habituated to people through the direct or indirect feeding. Property owners are advised to secure garbage and minimize things that attract coyotes to their properties, such as bird feeders, pet waste and fallen fruit from trees."*

With respect to the question of whether active management would be useful for managing the coyote population within Ottawa's boundaries, the Ministry of Natural Resources commented:

> *"Coyote populations normally fluctuate in response to the abundance or scarcity of food. When food supplies are limited, they experience a higher mortality rate and lower reproductive rates. Humans generally account for the majority of coyotes deaths through hunting, trapping and motor vehicle accidents, but mortality by humans has rarely been shown to have a major impact on coyote abundance."*

If humans account for the majority of coyote deaths, why do hunting and trapping rarely have a major impact on coyote abundance? Research shows that coyote populations respond to intensive control measures by increasing reproductive rates by 30 – 100% (Voigt and Berg 1999). For the same reason, chemical control programs (*i.e.* poisoning) have generally been ineffective for managing coyote populations in the long-term (Voigt and Berg 1999).

Based upon stable rates of human – coyote conflicts, the very low risk to public safety from coyotes, and the general ineffectiveness of coyote population management programs, significant changes to the

City's approach to coyotes appear unnecessary. However, some minor changes do appear warranted. Continuing public concern about coyotes suggests that the City could do a better job of communication regarding the real risks, deterrence, and appropriate responses to animals on private property. The City's website should be updated and expanded to include more information on prevention of human – coyote conflicts, deterrence of coyotes, and details on how and where to seek assistance with habituated coyotes (see Recommendation 3). The City could present an annual public information meeting on coyotes, as part of an urban wildlife speaker series (see Recommendation 5). The City should develop and disseminate age-appropriate information on coyotes to primary schools, as part of a general outreach program on urban wildlife (see Recommendation 6).

The City may also be slow in responding to cases of individual, habituated animals in villages, suburban and urban areas. For most non-emergency complaints, the City either refers people to information on the City and MNR websites, or recommends that they call the Ministry of Natural Resources. Some callers may be referred to a knowledgeable staff person in By-law and Regulatory Services, who can provide more detailed information and advice. That person, who is a biologist by education, provides this service on an informal basis, in addition to her normal duties. In the long-term, such an *ad hoc* approach is not sustainable, depending as it does on a willing individual rather than a defined staff position with the appropriate role and responsibilities.

Where the continuing behaviour of individual coyotes suggests that they have lost their general fear of humans, or where they have become dependent upon human food sources, it might be appropriate for the City to respond before such behaviour escalates into aggression. Staff recommends that the City's direct response to individual problem coyotes be expanded to include the assessment of animals exhibiting consistent signs of habituation, before they become an immediate risk to public safety. This response should include a site visit to assess the behaviour of the animal and its context, an evaluation of the probable attractants and opportunities for deterrence, and a determination of the appropriate response, including the human removal of the animal where necessary. However, such a service would require a dedicated City Wildlife Biologist (see Recommendation # 11, Creation of City Wildlife Biologist Position).

Recommendations

9. Staff recommends that the City of Ottawa's direct response to individual, problem coyotes be expanded to include the assessment of animals exhibiting consistent signs of habituation, before they become an immediate risk to public safety.

11. Animal Transmitted Diseases

Wildlife has the potential to carry and transmit serious diseases, including life-threatening diseases such as rabies. Some of these diseases are endemic to the Ottawa region, while others have expanded north into the Ottawa region (*e.g.* Lyme disease). The threat of disease has sometimes been used as an argument for aggressive population management of some common urban wildlife species, such as white-tailed deer, beaver, raccoons, skunks, coyotes, foxes and bats. However, monitoring by Ottawa Public Health suggests that the risks to the public from animal transmitted diseases are very low and remarkably stable.

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Giardiasis

Giardiasis, sometimes referred to as "beaver fever," is an infection of the lower intestine caused by a protozoan. The primary source of the microorganism is water contaminated by human or animal fecal matter, with cattle noted as a common reservoir. Secondary transmission from person-to-person is the most commons means of human infection.

Ottawa Public Health records an average of approximately 150 cases of giardiasis each year. This number is thought to be an underestimate, because many cases are likely to be asymptomatic or not sufficiently serious to require medical treatment.

Follow-up by Ottawa Public Health on 80 cases of giardiasis in 2011 identified the top five risk factors as:

- Travel outside the province in the last 25 days
- Recreational water contact
- Lived outside of province
- Consumption of potentially contaminated water
- Consumption of raw, unwashed fruits and vegetables.

It appears likely that some of these factors are associated with recreational wilderness activities, such as camping and canoeing.

Cryptosporidiosis

Cryptosporidiosis is an infection of the small intestine caused by a parasite. It can cause extreme diarrhoea and can lead to severe or life-threatening complications in people with weakened immune systems. Full recovery in healthy individuals can take up to one month. The primary source of the microorganism is water contaminated by human or animal fecal matter, with cattle noted as a common reservoir. Secondary transmission from person-to-person is common.

Ottawa Public Heath records an average of approximately 25 cases of cryptosporidiosis each year.

Follow-up by Ottawa Public Health on 15 cases of cryptosporidiosis in 2011 identified the top five risk factors as:

- Consumption of potentially contaminated water
- Animal contact (*e.g.* pets, farm animals, petting zoo)
- Recreational water contact
- Travel outside province in last 12 days
- Consumption of raw, unwashed fruits and vegetables.

Rabies

Rabies is a deadly viral infection transmitted in the saliva of infected animals through bites or broken skin. Immediate administration of a vaccine following a bite is nearly 100% effective in preventing development of disease symptoms. Conversely, rabies is nearly 100% fatal once symptoms have developed. The last human fatality from rabies in Canada occurred in Alberta in 2007 from a bat bite.

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Three strains of rabies occur in Ontario. The raccoon strain entered Ontario from the United States in 1999. The arctic fox strain, which mainly occurs now in striped skunks, is endemic to Ontario. The bat strain has been known in Ontario since 1961.

Ontario conducts an aggressive program of rabies monitoring and prevention in terrestrial animals. The focus of the campaign is the distribution of rabies vaccine bait in areas bordering the United States and other high risk areas, targeting skunks, foxes and raccoons. The program has been highly successful, resulting in almost complete elimination of the raccoon and arctic fox strains of rabies from southern Ontario.

Unfortunately, rabies vaccine baits are ineffective on insect-eating bats. Approximately 2% of the bats submitted each year to the Province of Ontario for testing – a miniscule portion of the total population – are found to carry rabies. 95% of cases are found in big brown bats, the species most likely to take up residence in or near human habitation.

As a result of the Province's prevention program, the number of reports of rabies in animals in Ontario has dropped from a high of 217 in 2001 (of which 58 were bats) to 24 in 2011 (of which 23 were bats). The one non-bat infected in 2011 was a cow in southwestern Ontario, likely resulting from a bite by a skunk infected with the arctic fox strain.

Despite the very low incidence and risk of rabies in Ottawa, Ottawa Public Heath still takes a cautious approach to any potential exposures (*i.e.* injuries associated with wild animals, unknown animals, or domestic animals showing signs of illness). In 2011, there were 53 cases of prophylactic treatment with rabies vaccine in Ottawa.

Table 3. Prophylactic Treatment for Potential Rabies Exposure in Ottawa in 2011

Species	Count	Percent
Bat	21	39.6
Dog	20	37.7
Raccoon	5	9.4
Cat	4	7.6
Other	2	3.8
Unknown	1	1.9
Total	*53*	*100*

Data from Ottawa Public Health

Lyme Disease

Lyme disease is an infection by a spiral-shaped bacterium called, *Borrelia burgdorferi*. The bacterium is transmitted to humans only through the bite of ticks. In Ontario, the primary tick involved in transmission of Lyme disease is the blacklegged tick. Ticks acquire the bacterium through feeding on deer and small infected small animals, such as mice, squirrels, birds. The initial symptoms are variable, but usually include a circular rash, fatigue, chills, headache, joint and muscle pains, and swollen lymph nodes. If treated at this early stage, the disease can be easily cured using common antibiotics. Left undetected and untreated, the disease can lead to a wide variety of persistent, potentially debilitating

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neurological and auto-immune disease-like symptoms. More advanced stages usually require prolonged treatment with antibiotics.

Although Lyme disease and infected ticks are found in the Ottawa each year, it is not yet clear if the disease is endemic in Ottawa (*i.e.* that it is self-sustaining) or if it is re-introduced annually or periodically by migrating birds. Since 2006, Ottawa Public Health has recorded an average of approximately five cases of Lyme disease each year. In 2011, that number jumped to 11 cases, possibly as a result of better detection methods. Ottawa Public Health followed up on nine cases, concluding that only one infection was acquired locally.

Ottawa lies near the northern edge of the range for blacklegged ticks. The shorter summer and colder winter may limit tick populations to a level at which the bacterium cannot easily spread. However, historical data shows Ottawa's winters becoming milder, which could lead to more favourable conditions for ticks. In that case, Lyme disease could become more common. Monitoring of Lyme disease by Ottawa Public Health should continue. Any consistent upward trend in cases of Lyme disease should prompt a re-evaluation of the local risks.

It has been suggested that more aggressive management and reduction of white-tailed deer populations might be warranted to reduce the risks of Lyme disease. Studies from the United States suggest that reductions in deer populations below 7.5 animals/km^2 can lead to reduced tick populations and, consequently, to a reduced incidence of Lyme disease (Stafford 2007). In Ottawa, deer populations have fluctuated between 2.5 animals/km^2 and 12 – 14 animals/km^2 over the past decade in response to winter conditions. Deer densities in some parts of the National Capital Commission Greenbelt are much higher. If the incidence of Lyme disease were to climb significantly in the future, then the City may want to consider recommending that the Ontario Ministry of Natural Resources and the National Capital Commission manage deer populations for an upper limit of 7.5 animals/km^2 through yearly adjustments to hunting quotas or other methods.

At present, however, Lyme disease does not pose a significant public health risk in Ottawa. No immediate response by the City appears necessary to protect public health. The current approach of providing information on tick avoidance and identification of symptoms appears sufficient and effective.

West Nile Virus

West Nile Virus is a virus transmitted to humans by mosquitoes that have first fed on infected birds, or by human – to – human transmission via infected blood products. It first appeared in Canada in 2002. Most people infected by West Nile Virus have no symptoms or mild, flu-like symptoms. In very rare cases, serious illness or death can result.

In 2011, there were 103 cases recorded in Canada. Ontario no longer conducts a West Nile Virus bird surveillance program. However, the City continues to carry out monitoring for infected mosquitoes in conjunction with preventative treatment of potential mosquito breeding areas with the natural control agent *Bacillus thuringiensis* (Bt). In 2011, the City found mosquitoes positive for West Nile Virus in 15 of 401 mosquito samples. Ottawa Public Health has not recorded a case of West Nile Virus since 2006.

At present, West Nile Virus does not pose a significant health risk in Ottawa. The City's current approach to monitoring and control appears sufficient and effective.

Diseases in Animal Fecal Matter

Urban wildlife have the potential to carry a number of other diseases, to which humans can become exposed through direct contact with faeces or urine. In most cases, these diseases pose little risk to people. However, they can have more serious health impacts on children, the elderly, or people with compromised immune systems. At least one of them – raccoon roundworm – can harm even healthy adults.

If residents have had urban wildlife nesting in their homes, then the City recommends extreme caution in the clean-up of contaminated areas and materials. In most cases, the City suggests that residents consult with a qualified wildlife service provider. A responsible service provider will attempt to determine the extent of the problem, and will recommend whether or not professional assistance is required. Service providers will often wear a full hazardous materials (Hazmat) suit while performing significant clean-ups. For less challenging clean-ups, service providers may advise residents on the appropriate precautions and protective clothing for doing the work themselves.

Staff recommends that the City's web pages regarding urban wildlife be updated and revised to include a strong recommendation that residents see the advice and assistance of a qualified wildlife service provider in the clean-up of areas and material contaminated by wildlife faeces or urine (see Recommendation #3).

12. Creation of a City Wildlife Biologist Position

The City of Ottawa is more than 2800 km^2 in size, most of which lies in the rural area. Approximately 1000 km^2 is forested, covered by wetland, or otherwise natural. If ranked in size against Canada's National Parks, the natural area of Ottawa would rank 25th out of the 43 parks, roughly the same size as Grasslands National Park. Furthermore, Ottawa's natural areas remain well-embedded in a broader natural landscape that includes Gatineau Park, the Ottawa Valley and the continentally-significant Algonquin-to-Adirondack landscape corridor. All of these factors contribute to an abundance and high diversity of wildlife, including 52 species at risk identified to date.

Within this large, diverse expanse, the City is the primary agent responsible for land use planning. It maintains the vast majority of the roads and other infrastructure, including 6500 culverts and other water crossings, and 1200 km of municipal drains. It owns extensive natural areas and has a policy of acquiring more. It has a strong policy commitment to the protection and promotion of biodiversity. This responsibility and commitment obliges staff to consider and to interact daily with wildlife, both in rural and urban areas.

Despite this, the City does not have a staff position devoted to wildlife issues and management. Instead, staff from other departments, who may incidentally possess some experience and expertise, are frequently asked to provide support and advice, outside of their formal job descriptions and usually to the detriment of their real duties.

For example, the Strategic Initiatives Project Officer in By-law and Regulatory Services currently manages and coordinates the City's large mammal response protocol, responds to persistent complaints regarding habituated coyotes, develops Call Centre protocols for the handling of wildlife calls, and has

coordinated a pilot project on geese "hazing" in parks. The large mammal response protocol alone requires this person to be on call 24 hours a day, 365 days a year. There is no provision for back-up in case of illness or holiday, and no contingency plan if she were to move into a different position. Ultimately, this *ad hoc* arrangement must fail. In another example, Senior and Intermediate Planners from the Land Use and Natural Systems Unit have been called upon to provide such ancillary services as species at risk surveys prior to culvert replacements, development of protocols for the application of herbicides near areas of wildlife habitat, the preparation of text for wildlife interpretive signs, and work with the public on wildlife stewardship initiatives. The provision of such wildlife-related services by By-law and Protective Services and Land Use and Natural Systems is neither efficient nor cost-effective. As discussed in the section on species at risk, a similar gap exists in the City's ability to ensure compliance with the provincial Endangered Species Act, 2007.

In addition to these service challenges, the lack of a designated expert at the City often leads to confusion when public concerns or controversies arise regarding wildlife and wildlife management. The resulting discussions sometimes draw in Councillors, senior managers, policy advisors and communications experts, as staff attempt to identify the person most appropriate to speak to the issues. Significant resources are wasted in the process. Similarly, no person has responsibility for the overall coordination and management of the City's wildlife service providers. This has a number of practical consequences: it complicates monitoring and reporting on City wildlife management activities; it constitutes an obstacle to the development and implementation of City wildlife management practices and standards; and it has led to confusion and frustration by partner agencies (such as the Ontario Ministry of Natural Resources and the National Capital Commission) when attempting to determine who to call at the City regarding wildlife management issues.

Finally, effective implementation of many of the other recommendations in this report cannot happen without a dedicated staff position. This includes the proposed coyote response process, the proposed review of the City's beaver management practices, and coordination of the proposed education and outreach initiatives.

The creation of a Wildlife Biologist position appears justified by the size of the City's natural areas, the diversity of the challenges, and public interest and concern for wildlife issues. The annual cost of such a position, including all benefits, would be approximately $100,000. However, substantial direct and indirect savings can be expected to result from:

- more efficient and cost-effective use of other staff in their proper roles and responsibilities;
- better coordination of the City's own wildlife management activities and service providers;
- potential long-term savings in road, trail and transit maintenance through expanded use of beaver deceivers;
- reduced financial risks to the City from unnecessary project delays and potential violations associated with the Endangered Species Act 2007;
- more effective public information and client service.

The Wildlife Biologist position would require a small, associated annual capital budget, especially for continued implementation of the large mammal emergency response program, the proposed, enhanced coyote response program, and the proposed primary school education and outreach program.

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Recommendation

11. Staff recommends that the City create a Wildlife Biologist position within Planning and Growth Management or Environmental Services, with the following responsibilities:

- Provision of advice and information about human-wildlife conflict resolution and other wildlife-related matters to other City staff and the public.
- Coordination of the City's contracts with wildlife service providers.
- Formal responsibility for management of the large mammal response protocol (requires that the person be on-call outside regular hours).
- Development and implementation of a pro-active response to habituated coyotes in villages, suburban and urban areas.
- Development and review of other wildlife response protocols as the need arises.
- Assessment of beaver conflict sites for the Surface Water Management Services Branch and the Roads and Traffic Operations and Maintenance Branch, and recommendation of appropriate management options.
- Assessment and resolution of other wildlife issues for Public Works.
- Development and implementation of policies and procedures to ensure compliance with the *Endangered Species Act, 2007* in City operations and maintenance.
- Working with Land Use and Natural Systems on implementation of species at risk planning and policies.
- Provision of support for species at risk stewardship programs and projects.
- Development and maintenance of urban wildlife education materials for the City's web site and elementary schools.
- Organizing an annual "Urban Wildlife Speakers Series", sponsored by the City.
- Addressing other wildlife issues as they arise.

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Appendix A Region of Ottawa – Carleton Construction Protocol for Wildlife (2000)

PROTOCOL - Wildlife Protection during Construction

If a sub-watershed plan is being prepared for an area, potential conflicts between wildlife and construction activities and recommended mitigation approaches should be addressed at a general level with recommendations for more specific measures during the development approval process.

If the proposed development is subject to an Environmental Impact Statement or a Wetland Impact Statement as per Section 5.4 and 5.5 of the Regional Official Plan, recommendations related to mitigating conflict between wildlife and any construction activity should be included within the assessment.

If the above two scenarios are not applicable, the issue will be dealt with through the existing conditions and preliminary tree saving process based on the following screening process.

Is the site adjacent to a Natural Environment A or B Area, Significant Wetland, or an Environmental Feature (Schedule K)?

If yes, then the preliminary tree saving plan should include recommendations on the staging of construction to ensure that potential habitat areas (Natural Vegetation areas) are not isolated from the adjacent environmental area prior to the final stages of construction, and that the timing of construction avoids disturbance of habitat areas during breeding season (generally mid May to end of June)

Is there a natural connection (stream corridor, wooded corridor) between the site and adjacent environmental designation?

If yes, then the preliminary tree saving plan should include measures to ensure that the connection is not severed prior to the final stages of development. During construction these areas should be protected from construction impacts by avoiding temporary stockpiling, snow fencing important areas, and other recommended mitigation measures required.

Is there an isolated habitat on the site which could lead to wildlife risks during construction?

An isolated habitat is considered to be:
a woodland >4ha. in size
a wetland or area of open water >1ha. in size

If yes, then the preliminary tree saving plan should provide recommendations to reduce risk and disturbance. These recommendations could involve a combination of avoiding construction impacts during breeding season or other critical times and providing some “escape route” if the area is to be disturbed.

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Appendix B Ottawa – Carleton Wildlife Centre Construction Protocol (as modified by City staff)

Minimizing Impacts to Wildlife During Construction through

Design and Construction Best Management Practices

This brochure provides a series of construction site Best Management Practices to guide contractors and developers in minimizing impacts to wildlife from the pre-consultation and design stage through to construction and occupancy. Topics include; a protocol for construction site pre-stressing; animal proof home design, and construction site management.

For health and safety reasons, and for protection of animals, removal and relocation of wildlife must only be done by qualified and properly equipped personnel. Information on qualified wildlife service providers is available from the Ottawa Humane Society.

All animal bites, whether from domestic animals or wildlife, can transmit serious diseases. Immediate medical treatment should be sought following any animal bite or suspected animal bite.

Eighty to ninety percent of reported wildlife conflicts result from development. Construction workers often witness firsthand the direct impact of construction activities on wildlife and wildlife habitat, and have been known to bring construction site orphans to the Wild Bird Care Centre and the Ottawa – Carleton Wildlife Centre when it operated a wildlife rehabilitation service. Some are highly uncomfortable with the losses to wildlife, but are hesitant to raise the issue with site managers. Direct impacts are the most common during the breeding season, when young are immobile and distressed mothers are unwilling to abandon them.

Wildlife that escape direct impacts suffer indirect impacts through displacement. Most animals are highly territorial, and displaced wildlife will wander back into new subdivisions searching for food and shelter, increasing the potential for human-wildlife conflicts. Dealing with wildlife conflicts can be costly to homeowners, both in terms of time and money. Although many believe that having the animal relocated is an easy solution, relocation has proven fatal in most cases. Relocated wildlife may be killed by those

defending their territory, will continue to seek out their original habitat, and may starve or die of exposure due to lack of food and available den sites.

However, steps can be taken to minimize the direct and indirect impacts to wildlife during construction without policy changes or the introduction of significant new development review requirements. The following best management practices focus on discouraging the use of the area by wildlife, encouraging the movement of wildlife to more suitable adjacent habitat, sensitive construction practices, and homeowner education. This brochure provides details on how contractors and developers can assist in preventing these conflicts from the pre-consultation and design stage through to construction and occupancy.

1. Pre-consultation, Preliminary Site Alteration, and Design

Pre-consult with City planning staff. The City of Ottawa requires that development proponents attend pre-application consultation meetings to discuss and determine the requirements for their application and to identify a preliminary list of issues to be addressed. During this meeting, City staff will provide the applicant with a copy of these Design and Construction Best Management Practices (BMPs). The City requires the incorporation of the Design and Construction BMPs into any required Tree Conservation Report or Environmental Impact Statement, and it strongly recommends their use in all projects with the potential to impact trees, natural vegetation or urban wildlife habitat. Use of the BMPs may be required by the City as a condition of development. Pre-consultation will ensure that advance measures are taken to ensure that construction activities do not isolate active habitat, such as a woodland area, without providing a means for wildlife to travel to adjacent habitat areas. Stream corridors and other linear green spaces could be maintained as travel corridors wherever possible.

Identify Wildlife Habitat in Environmental Impact Statements and Tree Conservation Reports. The City's guidelines for Environmental Impact Statements and Tree Conservation Reports require the identification of habitat for endangered and threatened species and significant wildlife habitat. However, as a best practice, environmental surveys and inventories should also include identification and mapping of other wildlife habitat features in order to guide construction mitigation measures. This should include the identification of any "wildlife trees" (*i.e.* trees with visible stick nests, or large trees with cavities) or other features (*i.e.* rock faces, large logs) that could provide nesting or den sites.

Minimize Preliminary Site Alteration. Some level of site alteration is often required in advance of a development application being submitted, to ensure that a property is suitable for the intended use. For

example, vehicular access may be required for soil testing and hydrological assessments, and can result in habitat damage or loss. Site alteration prior to obtaining development approvals can have profound effects on wildlife. If preliminary site alteration is required in an area where wildlife habitat is to be maintained, then the applicant may be required to mitigate for the disturbance as a condition of development approval. Applicants are advised to:

- Ensure that the recommendation of applicable Council approved land use plans and zoning have been integrated into the site design, where required.
- Preconsult with the City of Ottawa Planning and Growth Management Department prior to undertaking any site alteration.
- Ensure that any required studies, such as Environmental Impact Statements (EIS) or Tree Planting and Conservation Plans are undertaken prior to site alteration. These studies will identify areas of potential wildlife habitat on the site, and will provide site-specific mitigation measures for them. Any site alteration must conform to these mitigation measures. The requirement for an EIS or other supporting study will be determined through the pre-consultation process

Animal-proof through building design. Appropriate animal proofing measures installed in homes and buildings on sites abutting and/or encroaching on wildlife habitat can save money, time, and energy. Incorporation of the following design elements will help to ensure that homeowners will not have to endure unwelcome guests:

- Window wells should be screened to prevent animals such as skunks, rabbits and muskrats from becoming entrapped;
- Chimneys should have spark arrestor screens and caps to prevent entry;
- The screening that lines roofing vents should be replaced by welded wire mesh; plastic vents should not be used.

Schedule construction to avoid breeding season. From a wildlife perspective, there's no good time to undertake construction. During the fall and early winter, overwintering and hibernating wildlife may not be able to avoid construction. In the summer, wildlife can better avoid construction disturbance, but may have young to consider. However, the most profound impacts to wildlife due to construction occur when wildlife are displaced from their habitat at critical times during their life cycle; during breeding and migration. Tree removal should be avoided wherever possible, or done with care in avoiding trees with cavities and nests between April and July, the breeding season for birds and mammals. The attached table identifies specific species native to Ottawa, their habitat, and the period where construction should be avoided (see below).

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Pre-positioning of Nest boxes, Shelter and Feeding Stations. Construction impacts on wildlife are least in late summer and early autumn, when wildlife is most mobile and resources are abundant. However, should site preparation or construction be required in the late autumn or winter months, then displaced wildlife may benefit from the provision of additional nesting sites, shelter and food supplies. Pre-placement of nesting boxes and other temporary shelter is recommended in adjacent areas, as is the setting up of feeding stations for birds and small mammals. Any such shelters and feeding stations should be removed in the following autumn.

2. Construction Stage

Respect conditions of planning approvals, and legislated regulations. Some standard conditions of development approval are imposed to protect wildlife. These must be respected. In addition, other regulations may exist outside the planning approval that must be respected. For example, under the *Ministry of Natural Resources Fish and Wildlife Conservation Act, 1997,* relocation of wildlife must occur within 24 hours and within one kilometer of the point of capture.

If site alteration and construction during breeding season cannot be avoided. If wildlife are likely to be disrupted as a result of site alteration or construction, then every effort should be made to pre-stress the site to make the habitat undesirable for wildlife.

- Several days before construction, pre-stress the site by traversing it while creating a loud noise (voice, a loud radio) to scare off resident wildlife.
- Wildlife trees and other habitat features should be inspected by qualified wildlife personnel at the same time as pre-stressing. Where there are young or wintering/hibernating wildlife, a small cloth with human scent should be left in the nest to encourage relocation.
- A second pre-stressing should occur two days prior to site alteration or construction. Wildlife trees and other habitat features should again be inspected by qualified personnel.
- If adult or juvenile animals are still present in a wildlife tree or den, then they should be removed by qualified personnel. Nesting cavities or dens should be sealed to prevent re-entry.

Schedule construction to move from more disturbed areas to less disturbed If a corridor is being preserved through site design, identify the area to be preserved with flagging tape in trees, not fencing (unless silt fencing is required to prevent sedimentation and erosion) When the site abuts significant wildlife and no linkage corridor can be preserved through site design, construction should be staged to proceed from the most disturbed to the least disturbed habitat. For example, if the development is occurring off of an existing road and there is a protected natural area on the property to the north, construction should proceed from south to north, to eliminate disturbance to wildlife and to permit easy

access to the nearby safe habitat. If not, maintain a natural corridor until the final stages of construction, and begin construction activities where the trees are the least mature.

Manage construction sites to deter wildlife. Food garbage attracts wildlife. Contractors must be diligent in cleaning up food garbage daily so as not to attract wildlife. Construction materials also attract wildlife. Large diameter piping provides ready-made dens for foxes, porcupines, raccoons, and skunks. Smaller diameter piping can attract mice. Mice lodged in the piping can cause malfunctions once the pipes are installed. Pipe ends should be closed off with plastic or other suitable material, or inspected and any resident wildlife dislodged prior to utilization. Ponded water on development sites will attract wildlife but may be unsuitable for drinking.

Homes or buildings under construction during the early portion of the birthing season, April to June, should be secured so as to disallow access to wildlife seeking quiet shelter to have their young, particularly over weekend or holiday periods. If an animal has given birth in a building under construction, place a piece of clothing with human scent in the vicinity of the nest (often it is in a bathroom or where boxes are stored) and give the adult overnight to relocate her young.

3. Occupancy

Educate new homeowners in dealing with potential human-wildlife interactions. Human-wildlife conflicts are on the rise in Ottawa, and are likely to continue escalating due to development pressures. An increasing number of people are seeking help from the Ottawa – Carleton Wildlife Centre website for humane solutions to wildlife conflicts. If wildlife habitat has been disturbed to create a new development, or if parkland areas, linear corridors, or other natural areas have been preserved within the community, then residents are likely to experience ongoing interactions with wildlife. These homeowners should be provided with education materials on how to prevent and resolve conflicts to better coexist with wildlife.

The Ottawa – Carleton Wildlife Centre, provides the most progressive urban wildlife service in the country. Its success can attributed to prevention and education. The Centre operates a Conflict Resolution Website www.wildlifeinfo.ca, and an extensive public education and outreach program.

Prevention of human – wildlife conflict consists of two components: making the area less desirable and restricting access to wildlife. Human – wildlife conflicts are, for the most part, preventable or

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temporary. There are often simple, non-lethal, species – specific ways to address them. The most effective and long-term approach to preventing human-wildlife conflicts involves manipulating the potential habitat to render it incapable of providing the fundamental factors of survival: food, water, cover, and reproductive habitat. However, once a wildlife problem exists, impacts to both the wildlife and residents can be significant.

The Ottawa – Carleton Wildlife Centre has produced a brochure that provides general information on dealing with wildlife conflicts. It is available to individual homeowners from the City of Ottawa, and it is recommended for inclusion in homeowner information packages in all new suburban or rural residential development.

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Wildlife Fact Sheet

City of Ottawa

SPECIES	HABITATAND SEASONAL DENNING SITES	CRITICAL REARING PERIOD FOR YOUNG	NOCTURNAL? RABIES?	FOOD SOURCE
Bat	• Colonizes trees, rock cracks, crevices, cliffs; • Hibernates in caves or hollow tress and attics in urban areas.	Mid-April – Mid-August	Nocturnal Potential rabies hazard from bites.	Insects
Beaver	• Forests, near water courses lined with deciduous trees.	May - August		Softwoods, grasses, fruits, aquatic plants
Chipmunk	• Burrows in forest soils with plenty of groundcover, fallen logs to avoid predation.	Two litters: May – June and July – August		Seeds, nuts, berries
Coyote	• Farm fields to forests; • Dens concealed at base of hollow trees, stream banks.	April – July		Rodents, rabbits, muskrat, fruit; deer fawn in spring and summer; livestock.

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Eastern Grey Squirrel	• Tree cavities, leaf nests (dreys); • Eaves and attics during birthing season or as winter shelter.	Two litters: March – June and July – September		Tree buds, seeds, nuts, berries
Flying Squirrel	• Northern species inhabits boreal forest, mainly coniferous trees; • Southern species inhabits eastern deciduous forests, beech, maple, oak, hickory and poplar; • Nests in tree cavities and dead hollow trees.	May – August	Nocturnal	Lichens, buds, leaves, seeds, fleshy fruits and nuts, insects, birds and birds eggs
Muskrat (and Mink)	• Lodges (smaller than beaver) or burrows in marshy areas and stream banks.	Several litters: April – September		Marsh vegetation
Porcupine	• Thickets to mature forests, usually near streams and rivers; • Den in tree cavities or rock piles.	May – August	Nocturnal in summer only	Tree bark, leaves, coniferous needles
Cottontail Rabbit	• Meadows, orchards, fence rows, cultivated suburban landscapes with hedges for cover. • Grass and fur-lined shallow cavity in ground in gardens, under shrubs or in open tall grass.	Three or more litters a year: April – September. Young born without fur, eyes closed. Adult leaves nest unattended during the day, returning to nurse overnight.	Nocturnal	Grasses, clovers, twigs and buds of shrubs and young trees during winter
Snowshoe	• Forests, swamps and riverside thickets.	May – September	Nocturnal	Grasses, dandelions, clovers, leaves, buds, twigs, bark and evergreen

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Hare		Larger than a rabbit. Young born fully furred with eyes open. Often mistaken for a juvenile cottontail rabbit. If easily picked up, it is a youngster still nursing.		leaves of conifers during winter.
Raccoon	• Hardwood swamps preferred, but can live almost anywhere; • Overwinter in hollow trees, stumps, logs, barns, garages, attics, sewers, culverts.	Late March – August	Nocturnal Potential rabies hazard from bites.	Crayfish, freshwater clams, birds eggs, frogs, earthworms, snails, berries, corn, garbage
Red Fox	• Prefer forest edges, den in dry, sandy soil; • Streambanks, hedge rows, logs, dense brush; • Overwinter in dens, thick grasses.	March - August	Primarily nocturnal although often seen at sunset and early morning. Potential rabies hazard from bites.	Voles, mice, rabbits, hares, woodchucks, nesting waterfowl, frogs, snakes, insects (grasshoppers), berries

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Striped Skunk	• Mixed farmlands, grasslands, forests; • Winter torpor in abandoned dens, rock piles, under barns, sheds, and porches.	May - August	Nocturnal Potential rabies hazard from bites.	Insects (grasshoppers, white grubs, beetle larvae), voles, mice, moles, rabbits, fruit (wild grapes), plants
White-tailed Deer	• Forests and bushy areas; • Groups overwinter in "deer-yards" coniferous forests of hemlock, cedar, balsam, spruce and pine that provide protection from deep snow and storms.	May – September Mother stashes young fawns for long periods, returning to nurse overnight.		Woody plants, herbs, berries, nuts, grains
Woodchuck	• Open fields, elevated clearings and rocky slopes or berms.	May – late July	One of the only true hibernators in this region. Hibernates by late September, so care should be taken around obvious burrows where site work can compact the soil, and crush these animals.	Clover, dandelions, alfalfa, , plantains, goldenrod, fruits and garden vegetables

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			Pre-stress these sites in advance.	
NON-FOREST BIRDS				
Mallard	Nests in tall grass near lakes, rivers, wetlands	May - June		Aquatic and terrestrial plants, grains, seeds, insects. mollusks

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Appendix C. Example Structure and Content for the City's Wildlife Web Pages

- Eeek! It's a wild animal. What should I do?
    - When is it an emergency?
    - Who can help me?
- Ecology of urban wildlife
    - Why are they here?
    - The value of urban biodiversity
- Life history and behaviour of common urban and suburban wildlife:
    - Squirrels
    - Raccoons
    - Skunks
    - Common birds: pigeons, starlings, house finches, Canada geese
    - Bats
    - Coyotes
    - Foxes
    - Fishers
    - Species at risk: chimney swift, barn swallow, peregrine falcon, common nighthawk, snapping turtle, Blanding's turtle
- Prevention of human – wildlife conflicts:
    - Animal-proofing home and property
    - Respect for wildlife
    - Pets and wildlife
    - Living with coyotes
    - Making a place for species at risk
- Resolution of human – wildlife conflicts
    - Animals in the home and yard: options and personal choice
    - When to call a professional
    - How to choose a wildlife service provider
- Can it make me sick?
    - The real risks
    - When to be concerned
    - Common animal-transmitted diseases
- City of Ottawa Wildlife Management
    - Management on City property
    - Management in City infrastructure
        - Beaver management and demonstration projects
    - Wildlife-sensitive planning practices
    - Large mammal response
    - Coyote response
- Look Mom! Where, when and how to watch urban wildlife.
    - Tips for a junior naturalist
    - Ottawa's seasons
    - Ottawa Centre:
        - Rideau River and the Rideau River Natural Trail
        - Green's Creek
        - Ottawa River Trail

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        - Dows Lake and the Fletcher Wildlife Garden
        - Britannia Bay and Mud Lake
    - Ottawa East
        - Cardinal Creek
        - Petrie Island
        - Green's Creek
        - Mer Bleue
    - Ottawa South
        - Pine Grove
        - Pinhey Forest
        - Rideau River
        - Jock River
        - Leitrim Wetland
    - Ottawa West
        - Stony Swamp
        - Shirley's Bay
        - Greenbelt Pathway West
        - South March Highlands
        - Upper Poole Creek
    - Rural Ottawa (east to west)
        - Beckett Creek Bird Sanctuary and Baie Lafontaine
        - Bear Brook
        - Rideau River
        - Baxter Conservation Area
        - Rideau River Provincial Park
        - Jock River
        - Marlborough Forest and the TransCanada Trail
        - Manion Corners Long Swamp
        - Carp Hills
        - Constance Creek and Constance Bay
        - Burnt Lands Alvar
        - Mississippi River and Cody Creek
        - Fitzroy Harbour Provincial Park
        - Morris Island Conservation Area

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Appendix D. Questions to ask Wildlife Service Providers

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- Where will the animal(s) be relocated?

  Ontario Ministry of Natural Resources regulations prohibit the moving of animals more than one kilometre. If the service provider tells you that the animal is to be moved further, he or she does not understand the law or is intending to break it on your behalf.

- Is your company familiar with the birthing seasons of all species of wildlife in this area?

  YES. The service provider should be well versed in each species' birthing season: i.e. raccoons – March and June; squirrels – spring and late summer/early fall; groundhogs – April/May; skunks – May/June.

- Does your company provide removal of wildlife during the birthing season?

  NO. The removal of wildlife during the birthing season may create orphans or cause death if not done properly. Responsible service providers will suggest a "grace period" until the young can be safely removed along with the mother or until they vacate on their own.

- Does your company provide humane animal proofing as part of the overall solution package before or after attempting removals?

  YES. In most situations, this will prevent further conflict and will be cost effective for the homeowner. Responsible service providers will tell you this. Others will not and are perhaps looking for repeat business.

- Does your company provide conflict resolution and education?

  YES. The service provider should be well versed in each species and may be able to give homeowners solutions that may be less risky for the animal than removal.

- Is your company familiar with the biology and behaviour of local species of small wildlife?

  Yes. In order to deal effectively with each species, service providers must be familiar with the habits, behaviours, etc... of the various species common to this geographical area. They should know whether or not an animal is nocturnal or diurnal, where the animal commonly makes its home, how many young each species may have, etc....

- Does your company comply with the Ontario Fish and Wildlife Conservation Act?

  YES. This is an absolute requirement, as the OMNR will prosecute non-compliant companies or members of the public who take matters into their own hands.

- Has your staff had pre-exposure rabies vaccinations or any other vaccinations?

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YES. This is a health and safety concern. Responsible service providers will protect their staff.

- What type of training do you provide your employees?

  Wildlife Operators should have hands-on training and continue to keep themselves updated on all issues around wildlife as the law and "best practices" change over time.

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