DOCUMENT 1

Wildlife Strategy – City of Ottawa

Report and Recommendations

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Planning and Growth Management Department

Planning and Infrastructure

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1. Executive Summary

Background

The City of Ottawa is more than 2800 km^2 in size, most of which lies in the rural area (City of Ottawa 2011). Approximately 1000 km^2 is forested, covered by wetland, or otherwise natural. Another 1000 km^2 consists of agricultural lands. All of this area is well-embedded in a broader natural landscape that includes Gatineau Park, the Ottawa Valley and the continentally-significant Algonquin-to-Adirondack landscape corridor. Within the Ottawa's urban boundary lies the National Capital Greenbelt: a 20,000 hectare band of forests, wetland and farms dividing Ottawa's urban core and its surrounding suburbs. High quality linkages between the Greenbelt and the wider, natural landscape occur at numerous locations. Smaller natural areas lie within the suburban and urban landscape, often connected to wildlife corridors by a finer network of parks, trails and greenspace linkages. All of these factors contribute to a large and diverse wildlife community, ranging from Ontario's largest terrestrial animal, the moose, to some of the smallest backyard residents, like the eastern chipmunk. Consequently, life in Ottawa's is characterized by frequent interactions with wildlife – mostly positive, but sometimes with negative consequences for both human and non-human residents.

Within this large area, the City is the primary agent responsible for land use planning. It maintains the majority of the roads and other infrastructure; 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. These responsibilities and commitments oblige City personnel to consider and to interact regularly with wildlife. This Wildlife Strategy represents the first comprehensive attempt by the City to review and summarize its approach and policies to promoting positive interactions between humans and wildlife.

Council Direction

On February 24, 2010, City Council directed staff to develop an integrated and comprehensive Wildlife Strategy centred on "wildlife-sensitive planning, with a focus on public education and awareness programs" and including "protocols to be required in conditions of plans of subdivision and site plans." Council emphasized that the Wildlife Strategy should reflect an "ecosystem perspective" through policies and actions that would facilitate and foster a more harmonious relationship with all wildlife. Council's direction reflected not only general concerns for biodiversity and harmony with nature, but also specific issues and complaints arising from the City's current policies and procedures for responding to individual animals or populations of animals. Ottawa's Wildlife Strategy, therefore, strives to reflect the full complexity of human relations with wild animals, from the impacts of urban expansion on the integrity and connectivity of wildlife habitat, to the welfare of individual animals in conflict with human needs. It 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, suburban, village and rural areas;
- The development of a strategy and recommendations with respect to all of the above areas

The Wildlife Strategy makes frequent reference to "urban" wildlife species. This should be understood to refer to wildlife in any developed residential area, whether urban, suburban or village.

Wildlife-Sensitive Planning

Section 2.1 of the *Provincial Policy Statement, 2005* (PPS) provides policies and direction to Ontario municipalities with respect to the protection of natural heritage and wildlife in the planning process. Section 4.5 of the PPS states that, "the official plan is the most important vehicle for implementation of this Provincial Policy Statement." Ottawa's Official Plan contains numerous policies for achievement of these PPS objectives (see Appendix C), and at the broadest scale is a *de facto* ecosystem management tool. However, the PPS also requires official plans to balance natural heritage policies with policies intended to achieve other objectives, and the PPS does not give priority to one set of policies over another. These other policies not only address social and economic objectives, but the protection of other important resources, such as agriculture and mineral aggregate resources. Consequently, Ottawa's Official plan and supporting documents (*i.e.* the Transportation Master Plan, the Infrastructure Master Plan, the Greenspace Master Plan) contemplate and provide for circumstances in which natural heritage, including wildlife, may be negatively affected in order to achieve other planning goals. Nonetheless, the PPS and Official Plan work together to promote a sustainable approach to planning and development.

The City has other tools for wildlife-sensitive planning. The Province requires Environmental Assessments (EAs) for major infrastructure projects, and the City requires Environmental Impact Statements (EISs) for any development application submitted within or adjacent to the City's natural heritage system. Both kinds of study assess the potential impacts of a project on the natural heritage system, propose appropriate mitigation or compensation measures, and determine under what conditions the project should proceed. After the Official Plan, they are the City's primary planning tools for protection of wildlife and wildlife habitat. In practice, an EA or EIS seldom results in the outright cancellation of a project, because such projects are normally proposed within the context of a broader planning document (such as the Official Plan). However, they almost always result in changes to projects for the protection of natural heritage and wildlife.

Despite the extensive integration of natural heritage and wildlife protection into the City's planning practices, the Wildlife Strategy has identified a number of gaps or areas that could be improved (Table 1). Some of these are addressed by the recommendations in the Wildlife Strategy, while others lie beyond its scope. One of the major gaps is the lack of a current, approved Wildlife Construction Protocol for use during the review of development applications. The Wildlife Strategy proposes that an old protocol developed by the Region of Ottawa – Carleton should be updated and expanded to include recommendations for preventing and resolving human – wildlife conflicts during the actual development process, including measures for developers, builders, contractors and new residents.

Education and Outreach

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 and on the prevention and resolution of human – wildlife conflicts. In addition, residents regularly express interest in the way that the City considers wildlife in planning processes, manages wildlife on City properties, or prevents and resolves conflicts between wildlife and municipal infrastructure.

The City provides information on wildlife issues through its web site and Call Centre. However, both the web site and the Call Centre rely strongly on links and references to external agencies, such as the Ministry of Natural Resources, the Ottawa Humane Society, and the Ottawa – Carleton Wildlife Centre. Much of the information on the web site consists of by-laws, reports, and planning documents. The Wildlife Strategy suggests that the City could make the web site more relevant and user-friendly by providing direct information on common wildlife species, best practices for prevention of human – wildlife conflicts, and options for resolution of human – wildlife conflicts. The web site 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. Just as important, the web site should present this information in a structure and format that is more accessible, immediately useful, and visually stimulating.

The Wildlife Strategy also recommends a one year trial of an Urban Wildlife Speaker Series, consisting of four evening presentations over the course of the year (early spring, early summer, autumn, winter). 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 location, the City might invite other organizations, agencies and private service providers to set out information materials and displays.

In order to reach a young audience, the Wildlife Strategy 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 on urban wildlife for primary schools. 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 instructions for children on how to respond to wild animals.

Preventing and Resolving Human – Wildlife Conflicts

Humans and wildlife will always interact. These interactions are generally positive. Many rural residents choose the countryside for the opportunities that it provides to observe wildlife and the natural world. Many urban residents find cheer on a cold winter morning in the sight of a cardinal or a squirrel at a feeder. However, conflicts do arise, and sometimes they are an unavoidable consequence of shared human and wildlife needs for food, shelter and security. Nonetheless, conflicts also arise from carelessness or lack of knowledge of private citizens and public officials regarding the behaviours of wildlife, especially urban wildlife.

In urban, suburban and village areas, conflicts with wildlife are easily preventable. The screening of entry points, the elimination of food sources, the maintenance of fencing, and simple deterrents can eliminate most conflicts. 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.

In rural areas, human – wildlife conflicts pose greater challenges. Agricultural losses to wildlife can create significant financial losses and hardship for farmers. Assistance and guidance is available to farmers through the Ontario Ministry of Natural Resources, the Ontario Ministry of Agriculture, Food

and Rural Affairs, the Ontario Federation of Agriculture and the Ontario Soil and Crop Improvement Association. The *Fish and Wildlife Conservation Act* outlines the actions that landowners can take to prevent damage to their properties.

At present, the City of Ottawa has a limited role in the prevention and resolution of human – wildlife conflicts, especially in rural areas. Most of the responsibilities and authority for wildlife issues rest with the Ontario Ministry of Natural Resources (OMNR) under the *Fish and Wildlife Conservation Act, 1997* and the *Endangered Species Act, 2007*. In the federal lands of the National Capital Greenbelt, this responsibility lies with the National Capital Commission, which maintains its own staff of Conservation Officers. The City's current responsibilities for the prevention and resolution of human – wildlife conflicts lie primarily in three areas: on its own property, in the immediate protection of public health and safety, and in the provision of public information on human – wildlife interactions. However, in December 2012, the Province of Ontario announced proposed changes to the *Fish and Wildlife Conservation Act, 1997* and the *Endangered Species Act, 2007* that could result in a significant downloading of responsibility for wildlife population management and protection of species at risk to municipalities. The Wildlife Strategy recommends dialogue with the Province regarding these proposals.

Private property

Neither the Ontario Ministry of Natural Resources nor the City responds to routine human – wildlife conflicts on private property. Prevention and response to conflicts is the responsibility of property owners.

The City advocates prevention as the preferred approach to dealing with human – wildlife conflicts on private property, especially in urban areas. Property owners should be aware that no method for the removal of wild animals from a home or property comes without the risk of suffering by the target or non-target animals. If, however, wild animals have established themselves in or around a home, and an unacceptable conflict exists, then residents have two main choices. They may attempt to resolve the issue themselves, or they may call upon a wildlife service provider. In either case, the City recommends that residents contact and cooperate with their neighbours when dealing with wildlife conflicts. A coordinated response will likely result in greater effectiveness, cost savings, and a more positive outcome for both property owners and wildlife. The City 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 human – wildlife conflicts. This protocol should be made available on the City's website.

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.

In cooperation with By-law and Regulatory Services, the Ottawa Humane Society (OHS) developed a list of questions which it recommends that residents should ask when seeking a qualified wildlife service provider. These questions and the answers recommended by the OHS as most appropriate, are reprinted in Appendix B. They should be made available on the City's website for easy access.

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*. Three

species in particular may be of concern to residents: the chimney swift, the common nighthawk and the barn swallow. The City suggests that wildlife service providers and general contractors familiarize themselves with the laws protecting these birds, as well as options and best practices for protection of nesting sites.

City Property

The City relies on professional wildlife service providers for management of human - wildlife conflicts on its property. Prevention, tolerance and co-existence are always the City's preferred option. In some situations, where the presence or actions of an animal pose a risk to public health and safety, and no other options are available, the City's service providers will use lethal methods.

The Forestry Services Branch is often called upon to trim or remove trees on City property, particularly in urban and suburban areas. However, Forestry Services does not trim or remove trees containing adult animals or nests/dens containing young animals. Particular care is taken to comply with the requirements of the Canadian Wildlife Service under the *Migratory Birds Convention Act* regarding protection of nesting, migratory birds.

As a property owner, the City has its own responsibilities for protection of species at risk and habitat for species at risk under the ESA and SARA. Compliance with these Acts would benefit from additional staff resources.

Large Wild Mammal Response

Ottawa is fortunate to have large, high quality natural areas adjacent to and within its urban boundary. However, these natural areas can also provide access by wildlife to urbanized areas. Incidents of large wild animals in urban areas are 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.

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. Once public safety has been assured, the primary concern of the City is the welfare of the animal. The City has a wildlife service provider on call to respond to these incidents, as necessary. 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 will arrange for tranquilization and transportation of the animal. However, tranquilization is not without risk. Animals under stress may suffer fatal reactions to the tranquilizer, and tranquilization 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 euthanize the animal. This approach has been reviewed and supported by the Ontario Ministry of Natural Resources.

Management Challenges: White-tailed deer, Beavers, Canada Geese, Wild Turkeys and Coyotes

Some species of animals pose particular management challenges and have drawn public attention and concern in the past, especially white-tailed deer, beavers, Canada geese, wild turkeys and coyotes. At present, responsibility for management of populations of these species lies with the Ministry of Natural Resources and the National Capital Commission. However, the City may be called upon to respond to the presence of these animals under some circumstances. White-tailed deer must be considered in the context of road safety and perceived or real links to Lyme Disease. Beavers, Canada geese and wild turkeys must be considered with respect to protection of private property, infrastructure, park management and stormwater management. Coyotes must be considered with respect to perceived or real threats to public safety. The Wildlife Strategy reviews the City's programs and operations with respect to these five animal species.

With respect to white-tailed deer, the annual "Speeding Costs You Deerly" campaign is recognized as an effective program for reducing the risks of deer – vehicle collisions, having resulted in a 30% drop in automobile - deer collisions since its introduction. As for Lyme disease, research in the United States has shown associations between high deer densities and the incidence of the disease. However, monitoring of Lyme disease by Ottawa Public Health shows that it is a still a minor health hazard in Ottawa. At present, management of deer populations for public health does not appear necessary, but might need to be considered in the future.

With respect to beavers, opportunities appear to exist for the employment of "beaver deceivers" to protect some infrastructure (especially road and rail culverts), with associated ecosystem benefits and the potential for long-term maintenance cost savings. Seven *beaver deceiver demonstrations sites* have been established by the City. However, the City can find no precedent or support for the use of beaver deceivers in engineered stormwater management ponds, and the City's stormwater engineers have concluded that they may interfere with the performance and maintenance of those facilities.

With respect to Canada geese and wild turkeys, the growth in the populations of these species has created challenges for farmers, other residents and the City. They are with us to stay. Although they pose no direct risk to public safety, Canada geese and wild turkeys can cause economic losses, damage and impairment to City open spaces, and lost recreational opportunities and public enjoyment. Adaptive management practices can effectively reduce impacts on City property, while education and outreach are keys to reducing conflicts on private property.

With respect to coyotes, studies and research support the conclusion that they pose a minimal threat to public safety. However, *habituated* coyotes – those that have lost their fear of humans – can sometimes pose a hazard. The risks are extremely low and do not justify population management – which, in any event, is generally ineffective. However, they do appear to justify an expanded response by the City 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[s] and its context, an evaluation of the probable attractants and opportunities for deterrence, and a determination of the appropriate response, If necessary, this response could include the humane removal of the animal, although such instances are expected to be rare.

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 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 public health from animal transmitted diseases are very low and remarkably stable. At present, the City's current approaches to monitoring and management of these diseases appear sufficient and effective.

Wildlife Resource Officer

Despite Ottawa's large size and the challenges that it faces with respect to wildlife, the City does not have a staff position devoted to wildlife issues and management. Instead, personnel from other departments, who may incidentally possess some experience and expertise, are asked to provide support and advice outside of their formal job descriptions, and usually at the expense of their real duties. 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. Furthermore, with no one responsible for the overall coordination and management of the City's wildlife service providers, monitoring and reporting on City wildlife management activities is difficult, the development and implementation of City wildlife management practices and standards cannot occur, and partner agencies (such as the Ontario Ministry of Natural Resources and the National Capital Commission) do not know who to call at the City regarding wildlife management issues.

Effective implementation of the recommendations in the Wildlife Strategy 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 Resource Officer 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 personnel 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 Resource Officer would require a small, associated annual operating budget, especially for continued implementation of the large wild mammal emergency response program, the proposed, enhanced coyote response program, and the proposed primary school education and outreach program.

Public Reporting

The Wildlife Strategy recommends that the Wildlife Resource Officer report as required to the Agriculture and Rural Affairs Committee on City wildlife management initiatives and practices, trends, and emerging issues.

Recommendations

The Interim Wildlife Strategy makes nine recommendations:

Construction Protocol

1. That 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 development of the previously-proposed guideline for urban wildlife issues.
2. That Planning and Growth Management incorporate the updated construction protocol in the review of development applications.

Education and Outreach

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 be expanded to include more information on the city's natural areas and outdoor recreational opportunities.
5. That the City initiate a one year trial of an Urban Wildlife Speaker Series, consisting of four evening presentations over the course of 2013 - 2014 (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.

Beaver Management

7. That the City evaluates the potential effectiveness of beaver deceivers at road and railway culverts and suitable locations on new municipal drains, beginning with the demonstration project currently underway.

Coyotes

8. 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.

City Wildlife Resource Officer

9. That the City create a new position of Wildlife Resource Officer, with the following responsibilities:

- Provision of advice and information about human-wildlife conflict resolution and other wildlife-related matters to other city personnel 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 and recommendation of appropriate management options.
- Assessment and resolution of other wildlife issues affecting City operations.
- 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.
- Reporting as required to Agriculture and Rural Affairs Committee.

2. Introduction

The City of Ottawa is more than 2800 km^2 in size, most of which lies in the rural area (City of Ottawa 2011). 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. In fact, as the City's forests have matured and grown over recent decades, Ottawa has experienced the return of wildlife species long absent from the landscape, including moose, fisher, pine marten and even the occasional wolf.

Similarly, the City is remarkable for the size of its agricultural areas, which also total approximately 1000 km^2. These agricultural lands are distributed widely across the City. They often lie in close proximity to natural woodlands and wetlands and are frequently traversed by watercourses. A network of villages supports the agricultural community, and many of these villages contain or lie adjacent to natural areas. Consequently, life in Ottawa's rural landscape is characterized by frequent interactions with wildlife – mostly positive, but sometimes with negative consequences for both human and non-human residents.

Even within the suburban and urban areas of the City, encounters between humans and wildlife frequently occur. Many of these encounters occur within or adjacent to the National Capital Greenbelt: a 20,000 hectare band of forests, wetland and farms lying between Ottawa's urban core and its surrounding suburbs. The Federal National Capital Commission owns and manages 75% of the Greenbelt (14,950 ha), making it the largest, publically-owned city greenbelt in the world (National

Capital Commission 2012). Forests and wetlands cover almost half of the Greenbelt, including six core natural areas. High quality linkages between the Greenbelt and the wider, natural landscape occur at numerous locations, allowing wildlife to move in and out of suburban and urban areas. Movements of wildlife also occur along the Rideau and Ottawa Rivers, as well as smaller watercourses and valleys. Smaller natural areas lie within the suburban and urban landscape, often connected to wildlife corridors by a finer network of parks, trails and greenspace linkages. Together, these features support a diverse wildlife community, ranging from Ottawa's largest animal species (*i.e.* moose in the Mer Bleue wetlands) to its smallest backyard residents (*e.g.* the eastern chipmunk).

Within this large, rural, suburban and urban 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. These responsibilities and commitments oblige City personnel to consider and to interact daily with wildlife. This Wildlife Strategy represents the first comprehensive attempt by City to review and summarize its approach and policies to promoting positive interactions between humans and wildlife.

3. 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.

4. 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.

5. 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 2 – 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 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 has also produced guidelines for the preparation of environmental impact statements 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 2*. 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.

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 position or a Wildlife Resource Officer 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	Expansion of the City's three-year cycle of	City of Ottawa

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.	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.	(Planning and Growth Management/Infrastructure Services)
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		
Wildlife Construction Protocol	Development and approval of a wildlife construction protocol. Addressed in the report recommendations.	City of Ottawa (Planning and Growth Management)
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. This suggested action is not included in the Wildlife Strategy Report recommendations, but is under study by the Planning and Growth Management Department.	City (Planning and Growth Management)

6. 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 report to Regional Council on the protocol also references the planned creation of a, "brief guideline for urban wildlife issues which will:

- Outline for contractors when wildlife contact can be anticipated and appropriate procedures and measures to prevent harm to wildlife during construction,
- Outline for builders the types of measures that should be considered in home construction to avoid potential wildlife conflicts,
- Provide information for future residents that describes potential on-going urban wildlife conflicts and appropriate responses."

The guideline for urban wildlife issues was never completed. Consequently, a significant information gap remains with respect to practical, on-the-ground measures to mitigate the direct effects of development and construction on wildlife, especially common, urban wildlife.

Many residents have observed that the City's Environmental Impact Statement Guidelines and conditions of approval for development projects include a prohibition against large-scale vegetation removal during the breeding bird season. This prohibition arises specifically from the requirements of the Federal *Migratory Birds Convention Act, 1994*. It has been suggested that the City should develop a similar guideline and condition of approval to protect mammals during the hibernation and birthing seasons, when their mobility becomes severely restricted. This suggestion should be considered during the development of the proposed guideline for urban wildlife.

Recommendations

1. That 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 development of the previously-proposed guideline for urban wildlife issues.
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.

7. 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 in 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) personnel provide more detail in response to calls regarding wildlife. They direct residents to relevant agencies, such as the Ontario Ministry of Natural Resources (OMNR), the Ottawa Humane Society (OHS), or Ottawa Public Health. They also provide some limited practical advice on the prevention of human – wildlife conflicts. In some cases, they may arrange for a knowledgeable person in the Land Use and Natural Systems Unit or By-law & Regulatory 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 wild mammal in an urban area, a sick bat), nor does the City operate any kind of formal 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'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 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 the City 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 personnel. The City's commitment to service excellence would benefit from increasing the amount, relevance and accessibility of wildlife information that it provides, although the City's role with respect to wildlife may be more as a manager of lands.

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 the year (early spring, early summer, autumn, winter). 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 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 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 personnel.

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. It would include information on the prevention of human – wildlife conflicts, especially problems created by the feeding of wildlife. The kit should also include information on urban wildlife and safety, including instruction for children on how to respond 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 10,000 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 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.

8. Preventing and Resolving Human-Wildlife Conflicts

Humans and wildlife will always interact. Wherever natural landscapes and human landscapes meet, humans and wildlife will also meet: along suburban and village boundaries, where agriculture abuts forests or wetlands, wherever a road fragments a natural habitat. Within the developed landscape, the same holds true. Urban and suburban environments provide excellent habitat for many common animals, especially squirrels, raccoons, striped skunks, groundhogs, big brown bats, and several species of birds. In fact, because of the high availability of suitable shelter, habitat and food, densities of these animals are much higher in urban and suburban environments than in rural and natural environments. These interactions are generally positive. Many people choose a rural lifestyle for the opportunities that it provides to observe wildlife and the natural world. Many urban residents find cheer on a cold winter morning in the sight of a cardinal or a squirrel at a feeder.

In most cases, humans and urban wildlife coexist happily. However, conflicts do arise. Mammals and birds can cause significant losses to farmers (Mussel and Schmidt 2009). White-tailed deer may create driving hazards. 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 flocks of Canada geese leaving behind enormous quantities of faeces.

Conversely, many conflicts result from carelessness or lack of knowledge of private citizens and public officials regarding the needs and behaviours of wildlife, especially urban wildlife. Property owners may inadvertently create the conditions that attract wildlife and put them at risk, such as the removal of natural shelter and food sources, inadequate maintenance of building envelopes, careless feeding of domestic animals, or direct feeding of wild animals. Often such behaviours also affect adjacent property owners, which can lead to both negative consequences for wildlife and conflicts between neighbours.

Fortunately, in urban and suburban areas, conflicts with wildlife are easily preventable. The screening of entry points, the elimination of food sources, the maintenance of fencing, and simple deterrents can eliminate most conflicts. 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.

Human – wildlife conflicts in rural areas pose greater challenges. Agricultural losses to wildlife can create significant financial losses and hardship for farmers. They include coyote predation on livestock, consumption and trampling of crops by white-tailed deer, feeding by Canada geese, feeding by wild turkeys, and the flooding of agricultural land by beavers. Farmers can, and do, reduce many of these impacts through preventative measures: through fencing, for example, or investment in guard animals. These measures have significant costs, and none are entirely effective. Assistance and guidance is available to farmers through the Ontario Ministry of Natural Resources, the Ontario Ministry of Agriculture, Food and Rural Affairs, the Ontario Federation of Agriculture and the Ontario Soil and Crop Improvement Association. This includes financial support through the Canada – Ontario Farm Stewardship Program. However, direct wildlife management is sometimes necessary, including both the removal of individual problem animals, or more general population management. The *Fish and Wildlife Conservation Act* outlines the actions that landowners can take to prevent damage to their properties.

With two important exceptions, the City of Ottawa currently has a limited role in the prevention and resolution of human – wildlife conflicts, especially in rural areas. At present, most of the responsibilities and authority for wildlife issues rest with the Ontario Ministry of Natural Resources (OMNR) under the *Fish and Wildlife Conservation Act, 1997* and the *Endangered Species Act, 2007*. These responsibilities include the monitoring and management of populations of any wildlife species that is hunted or trapped, including moose, white-tailed deer, black bear, wild turkey, coyote and beaver. In the federal lands of the National Capital Greenbelt, this responsibility lies with the National Capital Commission, which maintains its own staff of Conservation Officers.

The City has two areas of responsibility that overlap with the Province: administration of the Ontario Wildlife Damage Compensation Program, and administration of municipal drains under the *Drainage Act*. However, in both of these programs, the Provincial legislation and guidelines severely restrict the City's discretion in implementation. Essentially, the City acts as an agent of the Provincial government in order to administer these programs more effectively at the local level.

City Responsibilities

At present, the City's responsibilities for the prevention and resolution of human – wildlife conflicts lie primarily in three areas: on its own property, in the immediate protection of public health and safety, and in the provision of public information on human – wildlife interactions. The following sections of the Wildlife Strategy deal with specific issues within these areas.

Private Property

Neither the Ontario Ministry of Natural Resources nor the City responds to routine human – wildlife conflicts on private property. Prevention and response to conflicts is the responsibility of property owners.

The City supports prevention as the preferred approach to dealing with human – wildlife conflicts on private property, especially in urban, suburban and village areas. Furthermore, responses to human – wildlife conflicts should be tempered by a certain amount of understanding and tolerance. Wild animals should not bear the blame and the consequences for following their natural instincts, when simple measures could have prevented a conflict. The public should be aware that no method for the removal of wild animals from a home or property comes without the risk of suffering by the target or non-target animals. Live trapping and exclusion methods can lead to the separation of young animals from their parents. Lethal trapping methods can fail and result in protracted, painful deaths. Why should a family of raccoons or squirrels be subjected to such risks, simply because of an unsecured garbage can lid? The City suggests that prevention and toleration of occasional inconveniences is a more humane approach. Inappropriate actions can also lead to additional problems for the homeowner, not just harm to the animals, such as deceased and decomposing young in an attic or in between walls.

If, however, wild animals have established themselves in or around a home, and an unacceptable conflict exists, then the property owner must decide how to resolve the situation. Opinions differ on what constitutes the most humane approach to the resolution of such conflicts. The City takes no

position on the issue, but believes that residents should have all of the necessary information to make their own, informed decisions.

Two basic approaches exist for the resolution of unacceptable human – wildlife conflicts:

- *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 or property, 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, the Rideau Valley Wildlife Sanctuary, the Wild Bird Care Centre, the OSPCA and other allied organizations provide 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, because of the risks of animal-transmitted diseases.

- *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. Provincial regulations prohibit the relocation of animals more than 1 km from their place of capture.
    - *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.

In making a decision on which approach to take, residents should be aware that 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 or live-trapping of an animal from a primary den will normally result in its relocation to a secondary den. Consequently, the decision to exclude or live-trap an animal will not necessarily leave it exposed and unprotected. On the other hand, the secondary den may lie on a neighbour's property or in a neighbour's home. The City advises residents to contact and cooperate with their neighbours when dealing with wildlife conflicts. A coordinated response will likely result in greater effectiveness, cost savings, and a more positive outcome for both property owners and wildlife.

The City 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 human – wildlife conflicts. 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.

In cooperation with By-law and Regulatory Services, the Ottawa Humane Society (OHS) has developed a list of questions which it recommends that residents should ask when seeking a qualified wildlife service provider. These questions and the answers recommended by the OHS as most appropriate are reprinted in Appendix B. They should be made available on the City's website for easy access.

Species at Risk and Private Property

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 2013. 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. Outside of *Planning Act* processes, the City has no jurisdiction or responsibility regarding species at risk or their habitat on private property. However, the City notes that private property owners may have their own responsibilities under the *ESA*.

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.

City Property

The City relies on professional wildlife service providers for management of human - wildlife conflicts on its property. Prevention, tolerance and co-existence are always the City's preferred options. 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. Staff recommends that responsibility for coordination of the City's contracts with professional wildlife service providers be consolidated in one staff position, along responsibility for reviewing, revising and facilitating the implementation of City procedures for preventing and resolving human – wildlife conflicts on City properties.

Forestry Operations and Tree Removal

The Forestry Services Branch is often called upon to trim or remove trees on City property, particularly in urban areas, suburban areas and villages. 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. Particular care is taken to comply with the requirements of the Canadian Wildlife Service under the *Migratory Birds Convention Act* regarding protection of nesting, migratory birds. 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 the City of Ottawa

The City has 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 personnel 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. Personnel in the Land Use and Natural Systems unit 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.

Personnel of the Land Use and Natural Systems Unit currently devote approximately ½ of an FTE to species at risk issues. Staff believes that due diligence by the City requires identification of a specific staff position with formal responsibility for compliance with the ESA.

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 wild 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 own 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, which 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 wild mammals appear in suburban and urban areas is to remove any direct threat to public safety. The Ottawa Police Service will respond to reports, assess the situation on site, and take any immediate action necessary to prevent injury to the public. Ottawa Police will endeavour to 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 large wild mammals 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 a variety of levels of response. Once public safety has been assured, the primary concern of the service provider is the welfare of the animal. 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 arrange for the tranquilization and transport of the animal. However, tranquilization is not without significant risk to both the animal and, potentially, to the public. Animals under stress may suffer fatal reactions to the drugs, and tranquillization is often not effective on very excited animals, except at near fatal dosages. Furthermore, the animal must be calm and in an isolated and quiet location for accurate and timely delivery of the tranquilizer drugs. Failing that, the animal may become mobile again. 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 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. There have been no on-call staff costs charged to date.

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 that person's normal duties. In the long-term, such an *ad hoc* approach is not sustainable, depending as it does on a qualified and willing individual rather than a defined staff position with the appropriate role and responsibilities. Staff recommends the identification of a specific staff position with formal responsibility for management and coordination of the large mammal emergency response protocols.

Ottawa International Airport and Related Wildlife Policies

The Ottawa International Airport has a wildlife plan and strategy that is mandated and informed by federal government policies such as the *Aeronautics Act,* the *Canadian Aviation Regulations*, and Transport Canada's *Wildlife Control Procedures Manual*. The goal of the Airport Wildlife Management Plan (AWMP) is to promote aviation safety by reducing wildlife hazards and associated risks to aircraft and to airport operations caused by wildlife activities on, and in the vicinity of the Airport.

In the AWMP there are a number of active and passive approaches to wildlife management available to minimize the potential for serious wildlife strikes. The AWMP identifies critical species that pose a threat such as the Canada Goose and Ring-billed gulls and outlines appropriate control policies. Mammal species such as deer, coyotes and groundhogs can also cause damage by striking aircraft, or in the case of groundhogs, causing ground stability issues by burrowing under active runways. The incidence of these species is also related to high risk activities located in the airport vicinity. For example, Transport Canada suggests that food-waste transfer stations or golf courses are inappropriate land uses in bird-hazard zones.

The Ottawa International Airport Authority actively engages the City of Ottawa planners, landowners and stakeholders, and agencies to address off-airport hazards. The Airport Zoning Regulations, established under the *Aeronautics Act* to address wildlife hazards outside the Airport Boundaries, are used to prevent lands in the vicinity of the airport from being used or developed in a manner that is hazardous to aircraft operations. Specifically, the Airport Zoning Regulations identifies a 'Bird Hazard Zone' where any land use or activity within the boundary that attracts birds is considered to be creating a hazard to aviation safety. A list of specific land uses and their associated risks is part of the information published and updated by Transport Canada in TP11500.

White-tailed deer

The mix of agricultural and natural areas across Ottawa's landscape creates ideal conditions for white-tailed deer. Deer are "edge" adapted species. Through much of the year, they spend their days lying or browsing within woodlands or along hedgerows, emerging during the early morning and evening hours into fields, gardens and the shoulders of roads to feed on grasses, grains or crops. In the autumn, when their numbers are highest, they begin to congregate in "deer stands" – woodlots, particularly coniferous woodlots – crossing highways and roads to reach their destinations. In the spring, they disperse again, fanning back out across the landscape.

White-tailed deer provoke a wide range of responses and cause a wide range of environmental impacts. For most people, the sight of deer across a field provides a thrill. For a hunter, the sight of a buck emerging from the autumn, morning mist may be the culmination of hours and days of effort and concentration. For wildlife in winter, the death of an old or diseased deer may provide the necessary energy and protein to survive a few more days or weeks. Conversely, for a driver inspecting a crushed fender and a shattered windshield, or a farmer inspecting crop damage, deer may represent a threat to life and livelihood. At high population densities, their browsing may cause measurable and significant ecosystem changes, altering patterns of regeneration in forests and reducing the native biodiversity of plant communities. Through their association with black-legged ticks and Lyme disease, they may contribute to health fears of suburban and rural residents.

It has been suggested that more aggressive management and reduction of white-tailed deer populations might be warranted to reduce the risks of deer – vehicle collisions and Lyme Disease. The MNR currently manages deer populations for a target density of 2 – 8 deer/km^2, and it estimates deer densities in the Ottawa area and throughout most of the Kemptville District at less than 5 deer/km^2. However, deer densities in some parts of the National Capital Commission Greenbelt are known to be much higher. Management of white-tailed deer is often a highly-controversial and political issue. Under existing laws and land tenure, the City of Ottawa has a very limited role in deer management. Under the *Discharge of Firearms By-law*, the City allows hunting on most rural, City-owned properties, subject to the Provincial *Fish and Wildlife Conservation Act*. The City also responds to white-tailed deer in urban areas through its Large Wild Mammal Response Protocol (see above). However, responsibility for managing deer populations and agricultural impacts from deer rests with the Ontario Ministry of Natural Resources or, on Federal lands, with the National Capital Commission.

The City's main responsibility with respect to deer comes from its ownership and maintenance of most of the City's road network. The City is responsible for promoting traffic safety along its roads, including programs to reduce the risk of collisions with wildlife. Signage plays an important role in the program, warning drivers in high risk areas to reduce speed and watch for deer. In addition, the City has collaborated with a number of partners and advisory groups on the development of the annual "Speeding Costs you Deerly" program. This campaign features increased public education activities during the most active deer seasons, including public service announcements and the temporarily placement of electronic, roadside message boards reminding drivers of the risks. Since implementation of the program, deer-vehicle collisions in Ottawa have dropped by 30%.

The Safer Roads Ottawa Program is particularly interested in a new safety system being tested in Eastern Ontario by the Ontario Ministry of Transportation (MTO): the Large Animal Warning Device System (LAWDS). Intended for installation at high risk locations, this LAWDS features warning lights connected to a network of sensors which will detect the entry of a large animal into a road corridor. The lights alert drivers to the presence of the animal, providing them with time to slow down and respond in a controlled manner. Safer Roads Ottawa has requested the MTO conduct a trial within Ottawa. Safer Roads Ottawa will continue to investigate and evaluate other methods for reducing deer – vehicle collisions.

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 of which encourage mitigation and avoidance measures as a first step. Both agencies also 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 employs trappers licensed by the Ontario Ministry of Natural Resources (OMNR) to trap beavers, using the recommended tools and methods. Where mitigation and avoidance measures are not practical, the OMNR recommends lethal trapping. Relocation of live-trapped beavers is not generally considered to be practical or humane, because of Provincial restrictions on animal relocation beyond 1 km, and because of territorial behaviour by beavers.

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. 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; Simon 2006). 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. A number of facilities in other municipalities have been suggested as examples of the use of beaver deceivers in stormwater ponds, including the Goodman Creek Stormwater Pond in Oshawa and Guindon Park in Cornwall. Staff has examined all of these examples and concluded that

none are representative of Ottawa's stormwater management facilities. In fact, staff is unaware of any municipality that regularly employs beaver deceivers in engineered stormwater facilities. On the contrary, all of the municipal stormwater management guidelines and policies found by staff recommend lethal trapping for the management of beavers in such facilities.

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 Surface Water Management Services Branch estimates that most facilities receive some form of routine inspection monthly and that problematic locations receive more frequent inspections during critical times of the year. Furthermore, new stormwater management ponds are being designed and constructed with the outlet structures that make them far more resistant to blockage by beavers, including partially submerged hoods to protect outlet pipes and wider spillways on weirs. As part of work on a new stormwater facility design manual, the Surface Water Management Services Branch is also re-examining the selection of tree species and other vegetation, as well as general landscaping, in the design and construction of new stormwater facilities in order to deter their use by beavers and other problematic urban wildlife, such as Canada geese.

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 with the Surface Water Management Services Branch 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 circumstances, 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 structural damage to culverts and road/rail beds is reduced. The City has established seven beaver deceiver demonstration sites in order to evaluate the cost-effectiveness of these devices and their ecological benefits.

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.

Five of the demonstration sites were installed in the summer and autumn of 2012 by the same contractor responsible for implementation of the NCC's Gatineau Park management program. With the assistance of the contractor, staff selected sites in both the urban and rural area, representing different conditions and challenges. All of the sites had a significant history of beaver activity and related

maintenance activities, including one major culvert replacement. Staff considered the sites to be low-risk locations, where the potential failure of the beaver deceivers would not create any immediate threat to property, infrastructure or public safety. The cost for establishment of the five additional demonstration sites was approximately $15,000. The Surface Water Management Services 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.

Figure 1. Goulbourn Forced Road Demonstration Site

Figure 2. Poole Creek Demonstration Site

Some of the installations, such as the Goulbourn Forced Road site, will require final adjustment in 2013 following re-establishment of more normal water conditions after the historic drought of 2011 – 2012. 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 at road and railway culverts and suitable locations on new municipal drains, beginning with the demonstration project currently underway.

Canada Geese

Many parks, stormwater management facilities and open spaces provide ideal habitat for urbanized Canada geese. The juxtaposition of ponds, rivers or wetlands immediately adjacent to manicured, grassy areas provides geese with all of their needs for food, nesting areas and security from predators. Unfortunately, geese produce enormous quantities of faeces: defecating up to 15 times *per* hour and producing between 30 and 175 grams of faecal matter *per* day, depending on food quality (between 1 – 5% their body weight) (Bedard and Gauthier 1986, Unckless and Makarewicz 2007). Based on these estimates, a flock of 50 birds could produce between 180 kg and 1050 kg of faecal matter over a four month period.

Such large amounts of faecal matter cannot only make public parks, beaches and open spaces unpleasant destinations for City residents, but they can have measureable effects on water quality. In summer months in particular, large goose populations can raise *Escherichia coli* levels in water beyond safe swimming levels, as well as contribute damaging amounts of nutrients to aquatic ecosystems.

Many effective methods exist for deterring Canada geese. The City has experimented in the past with many of them, including the "hazing" of geese by trained dogs at Andrew Haydon and Dick Bell Parks, experiments with repellents at Petrie Island, and different landscaping practices around stormwater management facilities. However, like most urban wildlife, Canada geese adapt quickly to new conditions. In order for deterrence measures to remain effective, they must be reviewed and modified periodically.

Unfortunately, many of the problems in parks and other public spaces arise from the feeding of Canada geese by visitors. Such feeding is prohibited on City property. The City has carried out public education programs in the past, and these programs should continue.

No one at the City currently has the responsibility or resources for implementing and monitoring geese deterrence practices. Consequently, there has been little follow-up on the City's geese management trials. Staff recommends the identification of a specific staff position with formal responsibility for management and coordination of geese management on City property.

Wild Turkeys

Between 1984 and 1987, the Ministry of Natural Resources and partners such as the Ontario Federation of Anglers and Hunters reintroduced 4,400 wild turkeys at 275 sites across Ontario (OFAH 2013). By 2007, the population had grown to 70,000 (OFAH 2013). Anecdotal evidence suggests that the population continues to grow dramatically as a result of abundant, suitable habitat and agricultural food sources. Flocks of 20, 30 or 40 turkeys routinely appear in rural areas of Ottawa, where they can cause significant crop damage. Although farmers are entitled to protect their property and crops from turkeys, no compensation program exists for economic losses.

More recently, turkeys have begun to appear around the edges of Ottawa's suburban communities, especially newer, expanding communities. These are "no firearms discharge" areas under City by-laws, where turkeys can quickly lose their fear of humans. Many people find turkeys fascinating and amusing, even to the point of feeding them. Conversely, although essentially harmless, the size and behaviour of turkeys can intimidate people unfamiliar with them. Human – turkey conflicts are increasing and becoming more controversial. Nonetheless, turkeys are likely to remain abundant in Ottawa, and residents must learn to adapt to them.

In rural areas, management of turkey populations is the responsibility of the Ministry of Natural Resources, through the issuance of hunting licenses. Turkey hunting continues to increase in popularity and in conjunction with natural predation of eggs and young by raccoons, skunks, coyotes and crows, should bring about stabilization or even a reduction in the turkey population Hughes *et al.* 2007). In suburban and village areas, education and outreach will be the key to peaceful coexistence. Residents should be encouraged to refrain from active feeding of wild turkeys and to remove other food sources, such as windfall apples. Relevant information should be made available on the City web sites and provided through the other education and outreach programs proposed in this strategy.

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 top predators, coyotes perform important ecosystem functions. They provide control on populations of small mammals and birds, such as beaver, geese and wild turkeys, and can help to provide stability in the composition and numbers of general wildlife populations (Voigt and Berg 1999, Gompper 2002).

The presence of coyotes in villages, suburbs and some urban areas has also caused concerns for some residents, who wonder if the animals pose a threat to family pets and children. 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. 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 may be related to a decrease in availability of white-tailed deer fawns and carcasses following the preceding 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 (Kemptville District Office staff, *pers comm.*).

Table 2. Livestock Compensation 2006 – 2011

Year	Compensation Claims
2006	75
2007	85
2008	98
2009	130
2010	102
2011	98
2012	99

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).

At present, the City does not have a standard procedure for responding to cases of individual, habituated animals in villages, suburban and urban areas. For most non-emergency complaints, the City usually refers people to information on the City and MNR websites. Some callers may be referred to a knowledgeable person in By-law & 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 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 humane removal of the animal where necessary. However, such a service would require a dedicated City staff person.

Recommendations

8. 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.

9. 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 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. Furthermore, some water-borne illnesses commonly perceived to be associated with wildlife – *e.g.* giardiasis ("beaver fever") and cryptosporidiosis – most often originate from human or domestic animal sources (Ottawa Public Health).

Animal faeces have the potential to carry a number of diseases or parasites, to which humans can become exposed through direct contact. Approximately 20 – 30 % of North Americans have been exposed to histoplasmosis, a fungal infection that, in rare instances, can cause respiratory illness in people with pre-existing conditions or weakened immune systems. Another common pathogen, raccoon roundworm, can result in serious illness through inadvertent ingestion (Roussere *et al* 2003). The City recommends that residents consult with Ottawa Public Health or a qualified wildlife service provider on the clean-up of areas or materials contaminated by wildlife faeces.

Two diseases warrant further discussion: rabies and Lyme disease.

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 Ontario in 2012. However, the victim contracted the disease outside the country. The last human fatality from rabies contracted in Canada occurred in Alberta in 2007 from a bat bite.

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. Ottawa was included within a Raccoon Rabies High Risk Area in 2002. 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. Fortunately, bats are naturally reclusive. Nonetheless, bats may be brought into homes by domestic animals, or they may enter the living space of homes from walls and attics during extreme climatic events (unusual heat or cold). Residents should always seek professional help for the removal of live bats from a home. Dead bats should be handled with gloved hands, wrapped in plastic, and taken to the Canadian Food Inspection Agency for testing. Any known bites should be reported immediately to a physician and Ottawa Public Health. If a bat is found in a bedroom or in the vicinity of any sleeping person, particularly a child or infant, then that person should be inspected by a physician for evidence of bites. Vaccination of dogs and cats against rabies is mandatory. Nonetheless, domestic animals coming into contact with bats should be monitored carefully and taken to a veterinarian at the sign of any illness or change in behaviour. However, these precautions should not be cause for alarm. Infected bats often lose their ability to fly and do not become aggressive. Consequently, they are highly unlikely to come into contact with people. Outside the home, bats pose no risk to humans and are effective insect predators.

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, for example, 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 only tick involved in transmission of Lyme disease is the blacklegged tick. Ticks acquire the bacterium through feeding on infected small animals, such as mice, squirrels and 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 neurological and auto-immune disease-like symptoms. More advanced stages usually require prolonged treatment with antibiotics.

The Public Health Agency of Canada and Ottawa Public Health do not consider Lyme Disease to be endemic in Ottawa (*i.e.* self-sustaining), although cases do occur each year. Evidence suggests that it may be re-introduced annually or periodically by migrating birds. Between 2006 and 2010, Ottawa Public Health recorded an average of approximately five cases of Lyme disease each year. In 2011 and 2012, the number jumped to 11 cases and 14 cases respectively, possibly as a result of better detection methods. Ottawa Public Health followed up on nine of the 2011 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. The Public Health Agency of Canada has identified Ottawa as a location with a moderate risk for future establishment of endemic Lyme disease. Lyme disease is a nationally reportable disease, and monitoring by Ottawa Public Health will continue. Any consistent upward trend in cases of Lyme disease should prompt a re-evaluation of the local risks.

The risk of Lyme Disease has sometimes been used as an argument for reductions in populations of white-tailed deer. The relationship between white-tailed deer and Lyme Disease is complex. Deer are "dead-end" hosts for the spirochete: although they may become infected by ticks, they show no symptoms of the disease and do not re-infect new ticks. The cycle of infection and re-infection only occurs in ticks feeding on smaller animals, such as mice, squirrels, skunks and raccoons. However, deer are the most important species for reproductive success of the black-legged tick, providing the adults with a place to mate and the blood meal necessary for egg production by female. Some studies from the United States have suggested 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). However, other studies have shown little or no relationship between deer densities and the risk of Lyme Disease, with other factors, such as the density of rodents, being more predictive of risk (*e.g.* Ostfeld *et al.* 2006).

The Ministry of Natural Resources manages deer populations for a target density of 2 – 8 deer/km^2, below the level thought to contribute to an increased density of black-legged ticks. However, deer densities in some parts of the National Capital Commission Greenbelt are known to be much higher. If the incidence of Lyme disease were to climb significantly in the future, then the City may want to recommend to the NCC that it consider managing deer populations in the Greenbelt to an upper limit of 7.5 animals/km^2.

At present, 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 to physicians and the public appears sufficient and effective.

10. Creation of a City Wildlife Resource Officer Position

Approval and implementation of the recommendations in this Wildlife Strategy will not resolve all existing human – wildlife conflicts or prevent new conflicts from developing. The key to long-term success of the Wildlife Strategy will be *adaptive management*: *i.e.* the continued and consistent evaluation of the City's wildlife planning and management practices. Urban and surburban wildlife are, themselves, continuously adapting to new environments, habitats and opportunities. The City must be able to adapt in response.

Currently, however, Ottawa does not have the capacity to implement an adaptive management approach to human – wildlife conflicts. Despite Ottawa's large size and the challenges that it faces with respect to wildlife, the City does not have a staff position devoted to wildlife issues and management. Instead, personnel 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 & Regulatory Services currently manages and coordinates the City's large wild mammal response protocol; responds to persistent complaints regarding habituated coyotes, wild turkeys, and other wildlife coming into conflict with humans; develops Call Centre protocols for the handling of wildlife calls; and has coordinated a pilot project on geese "hazing" in parks. The large wild mammal response protocol alone requires this person to be on call 24 hours a day, 365 days a year. There is very limited provision for back-up in case of illness or holiday, and no contingency plan if this person were to move into a different position. Similarly, 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 & Regulatory 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 attempts to identify the person most appropriate to address the issues. Similarly, no one 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 Resource Officer 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 operating 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 personnel 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 Resource Officer would require a small, associated annual operating budget, especially for continued implementation of the large wild mammal emergency response program, the proposed, enhanced coyote response program, and the proposed primary school education and outreach program.

Qualifications

The position of Wildlife Resource Officer would be very challenging, requiring a person with both strong professional qualifications in wildlife biology and strong public communication/engagement skills.

The person would require extensive practical experience in the prevention and resolution of human – wildlife conflicts and in the management of urban/suburban wildlife. The person must have the technical knowledge necessary to provide advice and direction on resolution of specific situations, including the use of non-lethal approaches, methods and tools. The person must have the organizational and computer skills to establish and maintain a database of wildlife conflict locations and successful management responses, for use in planning and implementation.

As the person most directly responsible for wildlife issues and management at the City, the Wildlife Resource Officer will need to deal daily with the public, media, senior managers, councillors and outside

agencies. The person will require strong diplomatic skills, combined with the confidence and ability to speak credibly from a base of knowledge and experience. The person must also have the confidence to seek and receive advice from other knowledgeable stakeholders and experts. Finally, the person must have an engaging personality and be able to communicate a passion for wildlife.

Such qualifications and skills are most likely to be found in mid-career, professional biologist, with a combination of both academic and practical experience in wildlife management. Such a candidate could come from either the private or public sector, although experience in both sectors would be preferable.

Public Engagement and Expert Involvement

Public outreach and engagement will be critical to the success of the Wildlife Resource Officer. Much of this engagement will occur in association with other responsibilities. The nurturing of key contacts within community associations, formal or *ad hoc* interest groups, and other social networks can often produce the most effective and efficient communication of information and ideas. City Councillors and their staff can usually identify such contact persons, and frequent cooperation is anticipated between Councillors' offices and the Wildlife Resource Officer.

No-one is an expert on all wildlife and wildlife issues. In many cases, the Wildlife Resource Officer will need to rely upon the expertise and advice of other public resource people. Fortunately, Ottawa is blessed with an abundance of active and retired experts in almost every field of ecology, biology and wildlife management. Many of them are current or past employees of agencies such as the Canadian Wildlife Service, Parks Canada, Agriculture Canada and the Ontario Ministry of Natural Resources. Many are current or former researchers at the University of Ottawa and Carleton University. Ottawa also is home to the oldest natural history club in Canada, the Ottawa Field-Naturalists' Club, publishers of the respected journal, The Canadian Field-Naturalist. Many other people have developed knowledge and expertise through personal experience and interest.

The Wildlife Resource Officer will be expected to build a network of knowledgeable people and experts upon which to draw for advice and guidance on wildlife issues. The Wildlife Resource Officer may be assisted in this screening process by the Directory of Experts on Call maintained by the City Clerk's and Solicitor's Office. The Directory, which arose out of the reorganization of the City's Public Advisory Committees, is intended to provide City staff with a list of pre-screened, public experts upon whom they can call for advice on an *ad hoc* basis.

Public Reporting

The Wildlife Strategy is a response, in part, to the difficulties that Ottawa residents, other agencies and even City personnel have experienced in obtaining information on the City's wildlife policies and management practices. No formal reporting process exists to provide City Council with such information. The creation of a City Wildlife Resource Officer Position would be the first step toward more effective communication by the City regarding wildlife policies and management practices. The responsibilities of such a position should include coordination of the City's contracts with wildlife service providers and the on-going review and improvement of the City's wildlife management practices. Staff

suggests that the Wildlife Resource Officer should report as required to the Agriculture and Rural Affairs Committee on City wildlife management initiatives and practices, trends, and emerging issues..

Recommendation

9. Staff recommends that the City create a Wildlife Resource Officer position, 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 wild 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.
- Working with the Ministry of Natural Resources and the National Capital Commission to coordinate wildlife management programs and activities.
- 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.
- Reporting to Agriculture and Rural Affairs Committee.
- 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.

Appendix B. 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?

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.