TORONTO

REPORT FOR ACTION

Update: Pollinator Protection Strategy

Date: April 19, 2017
To: Parks and Environment Committee
From: Chief Corporate Officer
Wards: All

SUMMARY

This report provides an update on the development of a Pollinator Protection Strategy for the City of Toronto, and the creation of best practices for native bee and butterfly conservation. It also responds to the request to investigate the City of Edmonton's Beekeeping Program and comment on its applicability to Toronto.

The goal of the Pollinator Protection Strategy is to identify additional actions that the City and community can take to create and enhance habitat for pollinators. The draft strategy identifies six key priorities, and proposes a series of actions for each priority. The primary focus of Toronto's strategy is the protection of native bees and butterflies. However, the majority of the actions designed to support native bees and butterflies, will also benefit all pollinators, including non-native honey bees.

Toronto is home to a wide range of pollinators, including over 360 species of bees and 112 species of butterflies. Recognizing that pollinators are a key component of a sustainable city, Toronto's vision is to have healthy pollinator populations that support resilient ecosystems and contribute to a rich urban biodiversity.

Pollinators are under increasing stress due to a number of factors and, as a result, some species are in decline. In recent years, significant media attention on the declining health of honey bees and the economic losses experienced by beekeepers, has taken the focus off the more ecologically-concerning decline of native bees. Evidence suggests that native bees are the most at risk, and if these species are lost, they cannot be replaced. Honey bees, conversely, are a non-native species introduced from Europe, re-introduced annually, managed by beekeepers, and are not endangered in Canada.

The City of Edmonton prohibits honey bees and beekeeping is only allowed through a permit process. An analysis of their program has led to the determination that Edmonton's model is not necessary or appropriate for Toronto. Honey bees are not prohibited in Toronto and beekeeping is already regulated by Provincial legislation that includes specific requirements which are sufficient for Toronto. In addition, recent studies indicate that non-native honey bees may negatively impact native pollinators due to competition for limited resources and the spread of diseases/pests. The City should therefore continue to focus on habitat creation efforts that will benefit all pollinators, rather than encourage the introduction of more non-native honey bees.

This strategy, developed collaboratively by Environment and Energy, City Planning, and Parks, Forestry and Recreation, will form part of the City's broader Biodiversity Strategy. City Planning, and Parks, Forestry and Recreation were consulted in the preparation of this report and agree with its content and conclusions.

RECOMMENDATIONS

The Chief Corporate Officer recommends that:

1. The Parks and Environment Committee receive this report for information.

FINANCIAL IMPACT

There is no financial impact resulting from this report. The financial impacts connected to the Pollinator Protection Strategy, being developed in response to item MM7.11 "Protection for Monarch Butterflies and Bees" adopted by City Council at its meeting on June 10, 2015, will be explored in a subsequent report to Parks and Environment Committee when the final strategy is presented at the end of 2017.

The Deputy City Manager & Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

On February 27, 2017, the Parks and Environment Committee:

1. Requested the Director, Environment and Energy, in collaboration with the Chief Planner and Executive Director, City Planning and the General Manager, Parks, Forestry and Recreation, to include in the City's Pollinator Protection Strategy report, scheduled for completion in 2018, the following actions:
a. The creation of a City procurement policy to purchase more native pollinator-friendly plants and to select plants and seeds that have not been treated with neonicotinoids for use in City-managed spaces;
b. The incorporation of these plant purchasing guidelines into tender documents for all City Divisions; and
c. The identification of pollinator-friendly plants on the plant list provided to City gardeners.

The decision document can be viewed here:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE17.5

City Council on March 31 and April 1, 2016, adopted a Resolution Designating the City of Toronto a Bee City. The decision document can be viewed here:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.PE10.3

City Council on June 10, 11 and 12, 2015, adopted the following:

1. City Council request the City Manager to review and to report back to City Council on potential options and programs through which the City can promote and incentivize private and public landowners to work in collaboration to protect and encourage natural habitats so as to sustain and renew the populations of Monarch butterflies (Milkweed planting) and bees that are a critical part of our ecosystem.

2. City Council request the City Manager to review the City of Edmonton's backyard Bee Keeping Pilot Program and report back to City Council on its applicability to the City of Toronto.

The decision document can be viewed here:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.MM7.11

COMMENTS

This report begins with an overview of bees and butterflies in Toronto, followed by a summary of current threats and why action is important. An update on the development of Toronto's Pollinator Protection Strategy is provided, along with the draft strategy for public consultation. A response to the request to investigate the City of Edmonton's Beekeeping Program and comment on its applicability to Toronto is also presented.

The content of this report is divided into the following sections:

Section I. Issue Background
- Pollination and pollinators
- Toronto's bees - native bees, managed bees, competition, species at risk
- Toronto's butterflies - migrants and residents, monarchs, species at risk
- Global and local threats to pollinators and why action is important
- Action by the Province of Ontario and City of Toronto

Section II. Developing a Pollinator Protection Strategy for Toronto: Update
- Project phases – a summary of accomplishments and next steps
- Draft strategy for public consultation - Vision, priorities and proposed actions

Section III. Urban Beekeeping in Toronto
- Beekeeping is not the ideal approach to protect Toronto's pollinators
- The Ontario Bees Act
- Review of City of Edmonton Backyard Beekeeping Program
- Recommended next steps for beekeeping in Toronto

Section I. Issue Background

Toronto is home to a wide range of pollinators, including over 360 species of bees and 112 species of butterflies. Many of these insects provide important ecosystem services such as pollination and are a source of food for birds, while contributing to the overall health of the biodiversity in our city. The primary focus of Toronto's Pollinator Protection Strategy is on native bees and butterflies as several species are in decline and facing extinction, such as the Rusty-patched Bumble bee (*Bombus affinis*) and the Monarch butterfly (*Danaus plexippus*).

What is pollination?

Pollination is the act of transferring pollen from the male part of a plant to the female part of a plant, allowing fertilization to take place. Pollination allows plants to produce viable seeds, full-bodied fruits, and new plants. Most plants cannot pollinate themselves, they need to attract pollinators through scent, nectar and bright colours to do it for them. Nearly 90% of wild flowering plants and 75% of the world's food crops are dependent on pollination. One in every three bites of food we eat relies on pollinators.

What are pollinators?

Wind, water, and animals can all serve as pollinating agents. Animal pollinators include bees, wasps, flies, butterflies, moths, beetles, and birds. Bees are the most specialized and efficient insect pollinator. Butterflies are not very efficient when it comes to pollination. Bees are a group of insects that have a variety of physical traits that allow them to collect, store and distribute pollen. For example, the branched hairs on their bodies allow them to collect pollen easily. Some even have structural appendages just for collecting pollen. Further, their entire lifecycle is dependent on interactions with flowering plants - bees visit flowers to collect food for their larvae, but also feed exclusively on pollen and nectar as adults.

The Province of Ontario, in its Pollinator Health Action Plan, has broadly divided pollinators into two general groups - wild pollinators and managed bees. Wild (or native) pollinators exist naturally within the environment and have coevolved with native flowering plants for over 100 million years. Managed bees (such as honey bees) are not wild - they are used to pollinate a broad range of Ontario crops in fields and greenhouses, and require humans to provide for some of their needs. For the purposes of this report, the term "native" will be used when referring to wild pollinators.

Toronto's bees

Native bees and managed bees can be found in Toronto. An average backyard garden in Toronto will likely contain over 50 species of bees, with some nesting and foraging there, and others visiting for pollen and nectar.

Native bees

Toronto's native bee community consists of over 360 species within six bee families and 37 bee genera. Bee species vary tremendously in colour, size and shape, sometimes making it difficult to distinguish what is a bee and what isn’t. The *Augochlora* bee, for example, commonly seen in Toronto, is metallic green. Bees range in size from less than 2mm to nearly 4cm in length.

Bees have a wide variety of nesting strategies. Most native bees solitary and nest in the ground or pre-existing cavities. Some, such as carpenter bees, excavate tunnels in wood. Native bees typically overwinter in pithy stems, rotting logs or underground.

Toronto's backyard fruits and vegetables are pollinated mostly by native bees. Many garden plants such as tomatoes, peppers and eggplants require "buzz pollination". Buzz pollination is a type of foraging behaviour which some native bees are capable of (e.g. bumble bees), but honey bees are not. In many cases, native bees are more effective pollinators on a per-bee basis than managed honey bees.

More information about Toronto's native bees can be found in the Bees of Toronto book, part of the City's Biodiversity Series.

Managed bees
The most common managed bee in Ontario is the non-native European Honey Bee (*Apis mellifera*). It is an introduced species brought to Canada by European settlers and re-introduced annually.

Managed honey bees live in colonies, are black and yellow/amber and are known to sting. Honey bees produce honey and also pollinate a broad range of Ontario crops, making them economically valuable in the agricultural sector. In 2016, there were more than 2,800 registered beekeepers in Ontario managing a total of over 97,000 colonies.

Other species of managed pollinators such as bumble bees, alfalfa leafcutter bees and blue orchard bees, are used to a lesser extent in Ontario. Bumble bees, which are native to Ontario, are the primary managed pollinator for greenhouse tomato and pepper production.

While honey bees make and store honey for overwintering needs, native bees don't produce honey, as they overwinter in a dormant state and do not require food stores. Table 1 shows the main differences between native bees and honey bees.

Table 1: General comparison of Canadian bees and European Honey Bees

Canadian Bees	**European Honey Bees**
Native	Not native
Wild	Managed
Don't produce honey	Make honey
Come in a wide range of colours	Black and yellow/amber
Most nest in the ground	Live in hives
Are primarily solitary, some live in colonies (e.g. bumble bees)	Are social and live in colonies
In most cases don’t sting	Sting

Competition between native and managed bees
In urban centres, where habitat is limited, the introduction of non-native bee species, such as honey bees, may impact populations of native pollinators. Honey bee colonies are massive in comparison to even the largest native bumble bee colonies (roughly 50,000 and 200 respectively). To sustain the colony, honey bees store honey, which requires them to collect additional resources to produce this stored food. This means that one honey bee colony can potentially out-compete thousands of native bees for food. Recent studies suggest that high honey bee densities may have an impact on the availability of local pollen and nectar, which may in turn negatively affect the food supply of other pollinators. Studies have also shown that managed bees may be responsible for introducing parasites and for an increase in disease prevalence in native bees.

Bees at risk
Several species of native pollinators have been identified to be at risk of extinction. Toronto's at-risk species include:

- Rusty-patched Bumble Bee (*Bombus affinis*) - Endangered status
- Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) - Endangered status
- Yellow-banded Bumble Bee (*Bombus terricola*) - Special Concern status

The Rusty-patched Bumble Bee
The Endangered Rusty-patched Bumble Bee (*B. affinis*) was a common sight in the city just a few decades ago. It nests primarily in abandoned rodent burrows. It visits many species of plants for pollen and nectar throughout its long colony cycle. Queens emerge in early April and the colonies continue to forage into early October. Though it was previously common it has not been found in Canada since 2009, despite extensive searches. In Toronto, specimens were collected at the University of Toronto campus as recently as the early 2000s. The major threats are thought to be pathogen spillover from managed bees and climate change.

European Honey Bees are not endangered in Canada
While there is growing concern about the declining health of the honey bee, the European Honey Bee (*A. mellifera*) is not endangered in Canada. When beekeepers experience a loss of bees, they can order replacement bees, at a cost. The significant media attention on the declining health of honey bees (often called colony collapse disorder) and the economic losses experienced by beekeepers, can take the focus off the more ecologically concerning decline of native bees. Evidence suggests that native bees are the most at risk and if these species are lost, they cannot be replaced.

Toronto's butterflies

Butterflies are beautiful and an essential part of our interconnected ecosystem. There are 112 species of butterflies recorded in Toronto, but populations of most of them are relatively small. Adult butterflies feed primarily on nectar from flowers. For each species of butterfly, its larvae (caterpillars) can only feed on specific plant species, known as larval host plants. To nurture our butterflies, we must nurture our caterpillars first.

More information about Toronto's butterflies can be found in the Butterflies of Toronto book, part of the City's Biodiversity Series.

Migrants and resident butterflies
A few species of Toronto butterflies migrate south for the winter while the majority remain in the city overwinter. The migrants cannot survive freezing temperatures so must overwinter in warmer climates. If they survive migration and successfully overwinter, then we can expect their descendants back in the spring. The resident species may overwinter as eggs, chrysalides, larvae or adults. These species require particular habitat such as leaf piles or sheltered areas to successfully overwinter.

Monarch butterflies
The Monarch butterfly (*D. plexippus*) is probably the world's most familiar butterfly, best known for the incredible migration of the eastern North American population. Individuals fly 3200 kilometres from breeding grounds in Toronto to overwinter in central Mexico. Monarchs return in the spring to find their larval host plants (milkweed), which do not grow in their overwintering sites.

Most adult Monarchs only live for about four to five weeks. However, late summer adults emerge in a state of suspended reproductive development. These are the true migrants that can live up to nine months, reaching the wintering sites in Mexico. Their southward journey becomes noticeable in the Toronto area around late August to mid-September each year. These migrants rely on the nectar available during this period, from a variety of flowers, including asters and goldenrod flowers.

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

Why are butterflies important?
Butterflies are an important part of our ecosystem. Caterpillars are a primary source of food for other animals, such as birds. Birds are fed thousands of caterpillars in their first few weeks after hatching. Native butterfly caterpillars feed on native plants and they have important roles as natural herbivores. While most people are not fond of caterpillars, they need to be nurtured both as the young of butterflies, and for their roles in the natural ecosystem.

Butterflies at risk
At least one species, the Karner Blue Butterfly (*Lycaeides Melissa Samuelis*), is extirpated (locally extinct) and a few species were only recorded a couple of times over the last 150 years.

Butterflies classified as Special Concern provincially, include the West Virginia White (*Pieris virginiensis*) and the Mottled Duskywing (*Erynnis martialis*). The Monarch butterfly (*D. plexippus*) is classified as Special Concern provincially and endangered federally. In addition, all eight swallowtail species recorded in Toronto are specially protected, requiring Provincial approval for collecting, breeding and research:

- Pipevine Swallowtail (*Battus philenor*)
- Zebra Swallowtail (*Protographium marcellus*)
- Black Swallowtail (*Papilio polyxenes*)
- Old World Swallowtail (*P. machaon*)
- Giant Swallowtail (*P. cresphontes*)
- Canadian Tiger Swallowtail (*P. canadensis*)
- Eastern Tiger Swallowtail (*P. glaucus*)
- Spicebush Swallowtail (*P. troilus*)

Global threats to pollinators

Pollinators, especially native bees and butterflies, are under increasing stress and populations are in decline worldwide. International trends suggest that pollinator declines are a result of the interacting impacts of several global stressors. The Province of Ontario has grouped these stressors into the following four broad categories:

1) Reduced habitat and poor nutrition
2) Climate change and weather
3) Diseases, pests, and genetics
4) Exposure to pesticides

1) Reduced habitat and poor nutrition

In Ontario, natural habitat is being threatened by fragmentation, degradation and loss of natural spaces, with the majority of impacts occurring in Southern Ontario. Habitat loss poses a major threat to our native pollinators, especially in urban areas.

2) Climate change and weather

There is evidence in Ontario of earlier spring thaws, causing bloom times of flowering plants to shift earlier than normal, while insects may still be dormant, leading to gaps in the availability of food. Extreme weather events can impact insect populations already stressed by climate change and other factors.

3) Diseases, pests, and genetics

The most well-known diseases and pests impact honey bees, such as the *Varroa* mite, American foulbrood, and small hive beetle. Recently, concerns have been raised about pathogens being spread from managed bee populations to native bee populations.

4) Exposure to pesticides

Insecticides are the type of pesticide that pose the greatest threat to pollinators. In recent years, there has been attention on neonicotinoids, a class of systemic insecticides that affect the central nervous system of insects, resulting in paralysis and death. Neonicotinoids are commonly used in seed treatment and have been widely used for agricultural purposes in Ontario since the mid 1990's.

Note about pesticides in Ontario: Toronto passed a Pesticide By-law in 2003, banning the use of cosmetic pesticides. Ontario followed with a provincial ban in 2009. In 2015, Ontario became the first jurisdiction in North America to legislate restrictions that apply to neonicotinoid treated corn and soybean seeds under the Pesticides Act.

Local threats to pollinators

The stressors discussed above apply to pollinators in general and are on a global scale. The following threats, resulting from human activities, are specific to bees and butterflies in an urban environment and can be grouped in the following categories:

1) Forage habitat loss
2) Loss of larval host plants
3) Nesting habitat loss
4) Overwintering habitat loss
5) Introduced and invasive species
6) Pesticides

1) Forage habitat loss

When wildflower habitat is reduced, the availability of pollen and nectar for pollinators is also reduced. Bees and butterflies need continuous access to flowers during their foraging periods (spring to fall). Locally-grown, organic, native plants provide native bees and butterflies with the ideal forage habitat they need.

2) Loss of larval host plants

The larvae (caterpillars) of each species of butterfly can only feed on specific plant, referred to as larval host plants. For Monarchs, this plant genus is milkweed (*Asclepias*). Monarchs cannot survive without milkweed. However, with shifting land management practices, we have lost much milkweed from the landscape. Planting native milkweed will help support Monarch populations. In Toronto, the best known milkweed species (and most readily available in plant nurseries) are common milkweed (*A. syriaca*), swamp milkweed (*A. incarnata*) and butterfly milkweed (*A. tuberosa*).

3) Nesting habitat loss

In natural landscapes, most bees are found nesting in sandy soil, bare patches in gardens or lawns, hollowed twigs and holes in wood. Converting a lawn or garden to concrete, gravel, mulch or artificial turf will make it impossible for bees to nest in. Other gardening practices, such tilling and burning dried stems or wood in which bees have nested can harm local bee populations. Nesting sites can be provided by leaving bare patches of sandy soil, dry stems, and raspberry stalks.

4) Overwintering habitat loss

Some native bees overwinter in cavities, tunnels, dry stems or wood. Bundles of raspberry stalks and other stems that are put out for yard waste collection in spring will often contain overwintering bees. Overwintering sites should be left undisturbed until the bees vacate, usually in spring or early summer.

5) Introduced and invasive species
In places with limited food and nest space, the introduction of non-native bees may negatively impact native bees. For example, the European Honey Bee (*A. mellifera*) and Wool Carder Bee (*Anthidium manicatum*) may make it more difficult for native bees to find sufficient resources and the Giant Resin Bee (*Megachile sculpturalis*) may displace nesting native bees. Invasive plant species, like garlic mustard, will outcompete natural forage and host plants required by bee and butterfly communities. Dog strangling vine (*Cynanchum rossicum*), an invasive plant from Europe, may negatively affect Monarch populations. Since this plant is closely related to milkweed, female Monarchs lay eggs on it, but the larvae cannot survive. Note: Contrary to its name, there are no reports of this plant actually strangling dogs.

6) Pesticides
Herbicides can kill the flowering plants that bees, butterflies and other pollinators need for nectar and pollen as well as larval host plants. Insecticides can kill bees directly and indirectly - some pesticides seem to cause bees to become disoriented, reduce their fertility or compromise their immune system. As previously mentioned, Toronto passed a Pesticide By-law in 2003, followed by a Provincial ban in 2009, leading to significantly reduced pesticide use in our city. However, pesticide products for non-cosmetic purposes are still available through retailers and as noted above, seeds and plants for sale are often, and unknowing to the consumer, treated with pesticides such as neonicotinoids which can transfer into nectar and pollen. Golf courses and specialty turf are exempt from the cosmetic pesticides ban.

Why action is important

Conserving and properly managing Toronto's diverse bee and butterfly communities is a key component of a sustainable, resilient, and biodiverse city. This begins with the preservation and restoration of natural habitats and wild spaces in Toronto. It also extends to habitat creation in gardens and yards in Toronto planted with native species.

It is critical to ecosystem functioning to maintain healthy populations of native bees and butterflies. Bees provide the invaluable service of pollination. Without bees, much of the food we eat and the natural landscapes we enjoy would not exist. Protecting bees protects agricultural economies, provides food security, and sustains and renews the natural environment. Plants need pollinators to produce viable seeds and new plants. Plants are the building blocks of our landscape - anchoring the soil preventing erosion, and fueling the nutrient cycle by decomposing and absorbing nutrients. Plants also provide a source of food and create habitat for birds, mammals and insects.

Butterflies are also an essential component of our ecosystem. Caterpillars have important roles as natural herbivores and food for birds. An ecosystem diminished of caterpillars will also be impoverished of birds, and other animals which feed on them.

The decline in some species of bees and butterflies is alarming. Once a species is extirpated (locally extinct) from an area, it is extremely difficult to reintroduce it. The actions proposed in the draft strategy are intended to ensure that species that can still be found in our city can survive and be sustained.

Province of Ontario action for pollinators
The Province of Ontario has recently released its Pollinator Health Action Plan. As part of the Province's broader Pollinator Health Strategy, this plan is designed to improve the health of all insect pollinators which support a strong agricultural sector and healthy environment. The plan is the result of significant input from stakeholders, including the City of Toronto, and serves as a call to action for all Ontarians to play a role in enhancing pollinator health.

City of Toronto support for pollinators
The City of Toronto has a long history of pollinator protection initiatives and is currently undertaking numerous activities to support healthy pollinator populations. In particular, our Parks, Forestry and Recreation Division has been a leader in habitat creation, enhancement and restoration efforts across the city. Several of these initiatives are highlighted as success stories in this report and the rest are summarized in Appendix 1.

Policies, plans and programs
As stated in Toronto's Official Plan, the City's vision for the future is one where "ecological diversity is conserved and nurtured for future generations". Further, as specified in Chapter 3 of the Official Plan, Toronto is committed to protecting, restoring and enhancing the health of natural ecosystems and supporting biodiversity, with specific attention to habitat for native species.

The City's Parks Plan (2013-17) identified areas of importance that relate to pollinator protection. Chapter 5 of the Parks Plan speaks to Parks, Forestry and Recreation's priority to protect, restore and enhance natural area parkland and recognizes that natural areas provide many ecosystem services such as habitat and pollination.

City Planning is currently working on a city-wide Biodiversity Strategy, of which the Pollinator Protection Strategy will be a part. This strategy will provide for the long term protection and enhancement of the city's native flora and fauna. A report on the Biodiversity Strategy is planned for the end of 2017.

Bees of Toronto and Butterflies of Toronto – the books
Available at local libraries and online, these books are a part of the City's Biodiversity Series. These are made-in-Toronto guides to bees and butterflies in the city, featuring profiles of Toronto's (un) Official Bee – the Bicoloured *Agapostemon* and Toronto’s (un) Official Butterfly – Eastern Tiger Swallowtail. Bees of Toronto, the first book on urban native and non-native bees in the world, was the result of a partnership between the City, researchers at York University and dedicated volunteers.

Toronto named the first Bee City in Canada
In April 2016, City Council showed its commitment to raising awareness of the importance of pollinators by adopting a resolution designating Toronto a Bee City. With that decision, Toronto became the first Bee City in Canada. Participation in the Bee City program raises awareness of pollinator protection activities and encourages Toronto and other municipalities to take action to support healthy pollinator populations.

Section II. Developing a Pollinator Protection Strategy for Toronto: Update

Since 2016, City staff from the Environment and Energy Division, City Planning, and Parks, Forestry and Recreation have been working together with other City divisions, the Toronto Region and Conservation Authority, and expert stakeholders to develop a Pollinator Protection Strategy, which will be a component of the broader Biodiversity Strategy currently underway and being led by City Planning.

The goal of the Pollinator Protection Strategy is to identify what additional actions can be taken by the City and the community to protect, enhance and create habitat for pollinators, such as bees and butterflies. The City is already doing many things to support pollinators, and this strategy is intended to bring those initiatives together under a comprehensive approach, while creating opportunities to establish new initiatives, partnerships and collaborations.

This report provides a summary of the work to date and the next steps of the project. The goal is to deliver a final strategy by the end of 2017, following a series of public consultations, additional research, and input from our advisory groups.

Project phases

The project consists of four phases: 1) Initiate and Assess, 2) Seek Expertise and Input, 3) Finalize and Implement and 4) Monitor and Review. Phase 1 & 2 are complete and Phase 3 is underway. More details are provided below.

Phase 1 - Initiate and assess

The goals of Phase 1 were to understand the current threats to pollinators and identify actions being taken by the City of Toronto and others that benefit pollinators.

A. Initiate: The project was initiated by building the consultation teams made up of staff from City divisions and external experts/stakeholders.

1) Build Core Project Team: The Core Project Team is made up of staff from the Environment and Energy Division, City Planning, and Parks, Forestry and Recreation.

2) Build additional support: The Core Project Team identified divisional champions and external experts/stakeholders for consultation when developing the strategy.

B. Assess: The Core Project Team has undertaken the following tasks:

1) Literature review: An examination of peer-reviewed research to gain an understanding of causes of pollinator decline and current approaches to pollinator protection, including a review of recent studies to understand the relationship between non-native honey bees on the native pollinator population in an urban environment.

2) Jurisdictional review: An investigation of pollinator protection initiatives being undertaken by other cities, with an emphasis on North American cities.

3) Policy review: A scan of current City of Toronto plans, policies and programs that support healthy pollinator populations, for the purposes of identifying opportunities to build upon current actions and implement new initiatives.

Phase 2 - Seek expertise and input
The goals of Phase 2 were to utilize the expertise of the advisory groups to identify possible approaches to protecting pollinators in our city, as well as gauge public awareness and seek public input on actions the City should take to protect pollinators.

The key achievement was the development of 44 proposed actions based on evidence-based research, expert advice and key recommendations from our advisory groups.
A. Consult with advisory groups: The following advisory groups were established to assist in the strategy development:

1) Inter-Divisional Pollinator Working Group: The City recognizes that protecting Toronto's pollinators goes beyond the mandate of any one City division and that this will require a City-wide approach that applies across multiple divisions. This group consists of City staff from the following divisions -Environment and Energy, Parks, Forestry and Recreation, City Planning, Transportation Services, Toronto Water, Toronto Public Health, Solid Waste Management, Tower & Neighbourhood Revitalization, Waterfront Toronto, Facilities and Real Estate, and the Toronto and Region Conservation Authority.

Key role and accomplishments: This group of divisional champions has developed an inventory of the current activities already underway, and previous achievements by the City (Appendix 1), and has assisted in identifying opportunities to expand these efforts and implement new initiatives. This group plays a key role in commenting on the feasibility of implementing the proposed actions presented in this report.

2) Expert Pollinator Advisory Group: The City acknowledges the important role of academic community, subject matter experts, and non-profit groups in providing guidance to the City on pollinator protection. The Expert Pollinator Advisory Group is made up of conservation biologists, academic researchers, pollinator and native plant experts, green roof researchers, beekeepers, and community based organizations.

Key role and accomplishments: City staff have been fortunate to be able to tap into the expertise of this group and receive evidence-based research and advice on how the city should be approaching pollinator protection. This group developed sets of key recommendations which formed the basis for the proposed actions.

We thank the members of the Expert Pollinator Advisory Group for donating their time, expertise and enthusiasm to this effort. This group has been instrumental in guiding the development of the proposed actions presented in this report.

Expert Pollinator Advisory Group members:

- Antonia Guidotti, Royal Ontario Museum
- Brock Harpur, York University
- Clement Kent, York University and Master Gardener
- Dave Barr, Toronto Field Naturalists
- Gillian Leitch, Landscape Designer and Beekeeper
- Jode Roberts, David Suzuki Foundation
- Jodi Lastman, Parks People
- Kathleen Law, Pollinator Partnership
- Liat Margolis, University of Toronto
- Lorraine Johnson, Native Plant Expert
- Oliver Cuoto, Toronto Beekeepers Co-Operative
- Sarah Hedges, Ontario Nature
- Scott MacIvor, University of Toronto
- Sheila Colla, York University
- Vicki Wojcik, Pollinator Partnership

B. Undertake initial public consultation activities

As part of the first step in public consultation, and as a means to gauge public awareness and willingness to participate in pollinator initiatives, a survey was developed and delivered in the August / September 2016. Over 500 responses were received.

Key findings from the survey:

- Over 90% of respondents are concerned declining native pollinator populations
- Nearly 90% of respondents indicated that the most significant reason bees are important are because they pollinate plants.
- The majority of respondents believe that the City should plant more pollinator-friendly plants in parks and encourage others to do the same.
- Over 87% are willing to add native pollinator-friendly plants to their garden.
- The majority of respondents believe that the City should provide free seeds and plants, and educational workshops to encourage residents, businesses and schools to plant native pollinator-friendly plants.
- Nearly 40% believe that honey bees are native to North America, showing the need for education about native pollinators.
- The majority of those surveyed are not interested in beekeeping on their property.

We are grateful to all of those that participated in the survey and shared their feedback with us. We will continue to seek public input as the strategy is further developed.

Phase 3 – Finalize and implement

Phase 3 is currently underway and will continue throughout 2017. Outlined below are the next key phases of the project.

A. Continue and expand public consultation (May - August 2017): Strategies to gather feedback include pop-up consultations at Community Environment Days, a breakout session at the Biodiversity Strategy Workshop, an online survey, and webinar.

B. Consultation with advisory groups (ongoing as required): Recognizing the key roles of our Inter-Divisional Pollinator Working Group and Expert Pollinator Advisory Group, these groups will continue to be engaged to guide the overall development of the final strategy.

C. Prioritize and finalize key actions (August - November 2017): The Core Project Team will develop a prioritized list of key actions (based on feedback from stakeholders), which will be put forward in the final Pollinator Protection Strategy.

D. Create best practices documents (August - November 2017): A series of practical, how-to-guides will be developed for target audiences, with specific guidelines for key pollinator friendly actions and practices. A draft of some of the best practices we have identified to date are included in Appendix 2.

E. Submission of final Pollinator Protection Strategy (December 2017): The final Pollinator Protection Strategy will be submitted to the Parks and Environment Committee at the end of 2017 and will form a part of the Biodiversity Strategy.

Phase 4 - Monitor and review
Once approved and implemented, the actions in the Pollinator Protection Strategy will be monitored, reviewed and updated as required.

A. Monitor: The Inter-Divisional Pollinator Working Group will meet twice a year to discuss successes and challenges with implementation of the strategy. This is an opportunity for staff to report back on progress and seek guidance on moving forward.

B. Review: The Expert Pollinator Advisory Group and other partners will be engaged as needed to get their feedback on our approach and share new ideas, actions and opportunities.

C. Update: The strategy will be reviewed and updated as required.

Draft Pollinator Protection Strategy for public consultation

While a great deal of work has been done to date, there are several additional actions which will be taken in 2017 as part of Phase 3 to finalize the strategy, including public engagement, consultation with the advisory groups, and additional research.

Feedback from residents, teachers, businesses, community groups, First Nations and others will be invaluable moving forward. Specifically, input will be sought on the six priorities and 44 proposed actions that make up the strategy.

The draft Pollinator Protection Strategy for public consultation is presented in Appendix 3 and summarized below.

Protecting Toronto's pollinators - Vision, priorities and proposed actions

The vision is for Toronto to be home to healthy pollinator populations that support resilient ecosystems and contribute to a rich urban biodiversity. To achieve this vision, six priorities have been identified for pollinator protection in Toronto:

1) Create and enhance habitat
2) Design and connect green spaces
3) Partner and build relationships
4) Invest, incentivize and inspire
5) Educate and train
6) Celebrate and recognize achievements

For each priority, a series of proposed actions have been developed that will help the City of Toronto achieve its vision. These proposed actions will not only support native bees and butterflies, but will also be beneficial to all pollinators, including non-native honey bees. Habitat creation in particular will have a positive impact on all pollinators, and is the foundation of the City's actions.

Below is a summary of the six priorities and a sampling of some proposed actions. For the full draft strategy and a list of all 44 proposed actions please see Appendix 3.

1) Create and enhance habitat

There are many ways the City can continue to create, restore and enhance habitat for pollinators. Many of the places to create pollinator habitat already exist - on the ground and on our rooftops. Our urban environment with patches of parkland, ravine, urban gardens and green roofs, can provide an abundance of floral resources and nesting sites for a wide range of pollinators. The simple act of planting wildflowers rich in pollen and nectar will have positive benefits for all pollinators that call Toronto home.

There are eight proposed actions for this priority including the following:

- Conduct an assessment of how much existing and potential pollinator habitat there is in Toronto and set targets for pollinator habitat creation and enhancement.
- Include in the City's existing guidelines regarding plantings in City parks, facilities and restoration projects, a commitment to plan more native trees, shrubs, and wildflowers that support pollinators.
- Work with members of City Council to identify at least one city-managed site in each of the 44 wards that can be enhanced for pollinators and serve as a model garden.

Success story:
The Humber Bay Butterfly Habitat (HBBH) - This City of Toronto led ecological restoration project provides critical habitat for a variety of native butterflies and other pollinators. Located along the shores of Lake Ontario in Toronto's west end, HBBH is approximately four acres and features a model home garden, wildflower meadow, short grass prairie, trails, and interpretive signage. The goal of HBBH is to establish a self-sustaining native plant community which will support a variety of butterfly species, while engaging and educating park users about the value of urban wildlife habitat.

2) Design and connect green spaces
As cities grow, habitat can be lost or fragmented into small patches, making it difficult for some species to access all of the resources they need to survive. By re-connecting green spaces, a continuous corridor of habitat can be created that allows pollinators to move freely from area to area and take advantage of the resources each patch has to offer. On a city-wide scale, parks, ravines, green roofs, and infrastructure corridors present the greatest opportunity for the conservation of pollinators. On a smaller scale, individual pollinator plantings such as urban gardens, parkettes, laneways, and planter boxes, can be linked to create a neighbourhood scale pollinator corridor.

There are six proposed actions for this priority including the following:
- Identify potential linkages to connect areas of existing pollinator habitat on publicly managed lands through geospatial mapping, and identify "micro" corridor connections where small scale plantings could connect two large green areas in close proximity.
- Support the efforts of the Toronto and Region Conservation Authority (TRCA) to create and connect pollinator habitat in utility corridors, and identify specific ways the City can work with TRCA to meet their goals.
- Enhance areas of the City Hall podium green roof with pollinator-friendly habitat, accompanied by educational signage, to demonstrate the role green roofs play in pollinator habitat and corridor creation.

Success story:
The Scarborough Centre Butterfly Trail - This TRCA initiative with funding from the W. Garfield Weston Foundation, revitalized approximately 40 hectares of hydro corridor space. By converting the area from barren mown grass into a meadow that provides high functioning pollinator habitat to complement the multi-use trail for pedestrians; the initiative transformed an underutilized space into an important part of the natural system in Toronto. This corridor represents an important pathway of connected greenspace, which allows pollinators to forage in a greater amount of area.

3) Partner and build relationships
It is vital to pollinator protection that the City continues to build relationships, consult, and engage with all stakeholders. There are groups in Toronto already working on pollinator protection initiatives and the City of Toronto can support and encourage their actions. Many of the actions proposed in this document cannot be achieved without the support and guidance of partners.

There are nine proposed actions for this priority including the following:

- Work with the Toronto Association of Business Improvement Areas (TABIA) to create pollinator habitat on private lands, with the goal of creating at least one pollinator garden in each BIA and investigate support for ongoing garden maintenance.
- Partner and build relationships with community based organizations working on pollinator protection initiatives, and identify how the City can help their efforts.
- Engage with the Toronto School Boards to encourage schools to create pollinator habitat, with the goal of creating a pollinator garden at every school, and investigate support for ongoing garden maintenance.

Success story:
Parkland Naturalization Program - The City works with community and environmental groups and funding partners to restore degraded natural landscapes and establish new natural areas to create forest, wetland, and meadow habitats. To date, more than 60,000 native trees and shrubs have been planted, as well as more than 50,000 wildflowers, herbaceous and aquatic plants.

4) Invest, incentivize and inspire
Investing in pollinator protection initiatives and incentivizing actions that create pollinator habitat will inspire and motivate people to act. City purchasing practices can be designed to support healthy pollinator populations. For example, the City purchases a great deal of plant material annually for use in our parks. This purchasing power can be utilized to shift the market toward growing and distributing native and pesticide-free plants that are beneficial to pollinators.

There are eight proposed actions for this priority including the following:

- Develop the criteria and seek funding sources for an incentive program that provides modest financial support or resources (e.g. soil, seeds, and plants) to encourage neighbourhood-scale, pollinator habitat creation or enhancement, and pollinator education initiatives.
- Explore the creation of a City procurement policy to purchase more native pollinator friendly plants, and to select plants and seeds that have not been treated with systemic pesticides (e.g. neonicotinoids) for use in City-managed spaces, and incorporate these guidelines into tender documents for all City divisions.
- Seek sponsorship, grant and external funding opportunities to support the actions presented in this report.

Success story:
Live Green Toronto Grants - An initiative of the City's Environment and Energy Division, this successful grant program ran from 2008-2015 and funded 168 community-led greening projects, including 40 garden projects that provide important habitat for Toronto's pollinators. One recipient, the Franklin's Children's Garden - Pollination Station on Toronto Island, welcomed close to 40,000 visitors in the summer of 2016.

5) Educate and train
Strengthening education initiatives will leverage the interest in protecting pollinators that already exists in the community. The City has the opportunity to guide resident, business and institutional action, with the potential for significant positive change. It's also important to recognize the role of City staff, and the importance of delivering and expanding the "Horticulture Program of Excellence", which provides education and training to City staff.

There are eight proposed actions for this priority including the following:
- Develop and promote a series of practical how-to guides for specific audiences (businesses, schools, local communities, gardeners, etc.) that offer advice on actions to take to help pollinators, including creating pollinator habitat, and identifying practices which threaten pollinators.
- Work with Live Green Toronto programming to deliver workshops for gardeners on how to create a pollinator garden, and investigate delivering the workshops at libraries and community centres.
- Investigate the development of a point-of-sale campaign to help residents identify pollinator-friendly plants and seeds at local nurseries, and create lists of retailers that offer pesticide free plants.

Success story:
"Tickle Bees" and City Staff - In the spring of 2015, thousands of gentle, ground-nesting bees emerged with the warm weather in a City park. Being in close proximity to a playground, members of the public voiced their concern to the Park supervisor. City staff, having recently completed training on pollinators as part of the Horticulture Program of Excellence, identified the bees Mining bees, nicknamed the "Tickle Bee" by school children as they don’t sting and are very gentle. Staff installed educational signage about the "Tickle Bees" and the vital role they play in pollination. The community was thrilled to host these important pollinators and often stopped to observe their activity. Educating City staff about this important pollinator, led to this learning opportunity with the members of this community.

6) Celebrate and recognize achievements
The City can recognize the efforts of residents, businesses, community organizations, and institutions, by celebrating milestones and honouring the contributions of members of our community. Public signage, awards and certification programs will also raise the profile of the importance of pollinators, assist in educational efforts that encourage further action.

There are five proposed actions for this priority including the following:
- Celebrate and promote National Pollinator Week (third week in June) and Toronto's status as the first Bee City affiliate in Canada by undertaking at least one public education and/or habitat creation or restoration activity each year.
- Provide recognition through signage (e.g. Pollinators are Welcome Here!) to acknowledge the efforts of property owners who have created or enhanced pollinator habitat and/or contributed to corridor building in their neighbourhoods.
- Add a pollinator-friendly garden category to the City's existing Garden Awards program, and inspire others by offering in person and virtual tours of award-winning gardens.

Success story:
Celebrating National Pollinator Week - In June 2016 a mural of a green metallic sweat bee was unveiled at Bloor Street and Howland Avenue and a proclamation declaring "Pollinator Week" in Toronto was announced. The mural was the result of a partnership between Burt's Bees and the City's StreetARToronto and Live Green Toronto programs. Painted by Toronto artist Nick Sweetman, the mural is 65' long by 35' high and serves as a stunning reminder of the importance of pollinators in our urban environment.

Section III. Urban beekeeping in Toronto

Part 2 of City Council Decision MM7.11 requested a review of Edmonton's Backyard Beekeeping Pilot Program and its applicability to Toronto. To gather information and comments about the Edmonton measure, the Core Project Team consulted with staff at the City of Edmonton, with the Inter-Divisional Pollinator Working Group and with the Expert Pollinator Advisory Group. The Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA), which oversees the Ontario Bees Act, was also consulted.

Beekeeping in Canada specifically refers to keeping the European Honey Bee (*A. mellifera*), a non-native, introduced species from Europe. The sections below consider the potentially negative impacts from beekeeping on native pollinators. Introducing more non-native honey bees into our city is not the ideal approach to "save" pollinators, but other efforts, specifically habitat creation, offer greater benefits for all pollinators.

This discussion provides an overview of the Ontario Bees Act, which governs beekeeping in Toronto. The discussion highlights that current Provincial regulations are sufficient and achieve a satisfactory balance for beekeeping in Toronto. Recently, the Province announced that it will release a discussion paper to modernize the province’s legislative framework on beekeeping and will engage the City in the process.

In response to Council's direction, below is a review of Edmonton's beekeeping permit program, together with recommended next steps. Generally speaking, unlike in Toronto, Edmonton's animal welfare by-law prohibits honey bees and beekeeping. Faced with that prohibition, Edmonton piloted a permit system and developed guidelines as a compromise solution to allowing urban beekeeping. Such an approach is neither appropriate nor necessary in Toronto because: 1) Toronto's animal by-law does not prohibit honey bees or beekeeping and 2) Ontario's laws regarding beekeeping are more comprehensive and include specific setback requirements (unlike Alberta), leaving few gaps for Toronto to fill via a by-law.

Beekeeping is not the ideal approach to protect Toronto's pollinators – habitat creation offers the most benefits to all pollinators
The City should continue to focus on habitat creation efforts that will benefit all pollinators, both managed and native, rather than encourage the introduction of more non-native honey bees.

Recent studies suggest that one honey bee colony can potentially out-compete thousands of native bees for food - high-honey bee densities may have an impact on local pollen and nectar availability. In addition, managed bees may be responsible for parasite introductions and an increase in disease prevalence in native bees.

Many people who are concerned about the plight of the pollinator, may wish to take up hobby beekeeping because they believe that this is the best way they can help. What this well-meaning group of would-be beekeepers may not realize is that there are easier and more effective ways to help. One of the biggest problems facing all pollinators is habitat loss. Creating new habitat or enhancing existing habitat is a much easier and more effective way to support all pollinators in our city.

For example, acquiring the skillset to become a successful beekeeper requires a long term commitment and is a great deal of work. It is not as simple as placing a hive on your property and collecting the resulting honey. Novice beekeepers may lack the experience to manage diseases and pests, as well as deal with swarms (when the number of bees in the colony gets too big and roughly half the hive leaves to form a new colony). Swarming can often result in public nuisance, 911 calls and exterminators removing or killing the bees. Beekeepers must have knowledge to immediately identify and address potential issues with a hive. In order to manage bees safely and effectively, extensive training by a certified instructor and years of mentorship is required.

While, on the other hand, planting and maintaining a pollinator garden to create much needed habitat can be done by almost anyone, anywhere, with relatively little time and skill. The simple act of planting wildflowers is certain to make a positive impact on both managed honey bees, native bees and other pollinators. All bees need sources of pollen and nectar from flowers. Thus, everyone can be a beekeeper – by planting a pollinator garden on their property instead of keeping honey bees.

The Ontario Bees Act

The Ontario Bees Act is the legislation that regulates beekeeping in Ontario. The purpose is to protect the health of honey bees, particularly from pests and diseases. As indicated above, the Act is more comprehensive than a similar measure in Alberta, thereby obviating the need for Toronto to have detailed guidelines. The Act imposes several requirements on beekeepers including, but not limited to, the following:

1) Locations of hives: Honey bee colonies cannot be placed within 30 metres of a property line separating the land on which the hives are placed, or left from land occupied as a dwelling or used for a community centre, Public Park or other place of public assembly or recreation. In addition, hives (with or without bees) cannot be located within 10 metres of a highway or street (Section 19 of the Ontario Bees Act).

2) Registration: Anyone who owns or is in possession of honey bees must register annually with OMAFRA. There is no charge for registration. As part of the registration beekeepers are required to identify the location and the number of honey bee colonies.

3) Reporting pests and diseases: Beekeepers must report the presence of honey bee pests and diseases. Beekeepers are encouraged to inform inspectors of any symptoms of pests and diseases in honey bee colonies that are not typical.

4) Permits to sell and purchase honey bees: A permit must be obtained when selling honey bees or used beekeeping equipment within Ontario. A permit is also required when bees are leaving and/or returning to Ontario, another province or another country.

5) Inspections: Apiary inspectors can inspect all honey bee colonies by instruction of the Provincial Apiarist, request of the beekeeper or at the discretion of the Apiary Inspector. Duties include inspecting for the presence of diseases and pests and issuing permits.

Beekeeping activities in Toronto
Within Toronto, beekeeping is a hobby process undertaken by at least 126 registered beekeepers and regulated by the Ontario Bees Act. Managed honey bee colonies are permitted within Toronto provided the hive locations are in compliance with Section 19 of the Bees Act (location of hives). Beekeeping on rooftops must also meet the same setback requirements as at grade hives, regardless of the elevation of the rooftop.

In Toronto, honey bees can be found in gardens and on roofs in managed colonies maintained by practiced beekeepers and beekeeping cooperatives. The Toronto Beekeepers Association is an organization active in beekeeping activities in Toronto.

The current Ontario Bees Act, as it applies to Toronto, achieves a healthy balance for beekeeping in our city. The setback requirements allow beekeeping to be undertaken in areas large enough to support this activity, while limiting beekeeping in dense residential areas, where beekeeping activities may not be appropriate or welcome.

Province to review the Ontario Bees Act
The Province has indicated its intention to seek feedback on changes to the Bees Act by making the following commitment in the Pollinator Health Action Plan (Dec 2016):

"[The government will]… release and consult on a discussion paper on modernizing the legislative framework on beekeeping. Among other components, the modernization proposals could include provisions related to beekeeper training, updated requirements for the location of hives…"

The Provincial staff leading the review process have engaged the City of Toronto, and will continue to provide updates to City staff on the progress. While there is no specific timeline established for the review and consultation at this time, City staff will remain involved in order to provide feedback on proposed changes to the Bees Act.

Recognizing the importance of the results of the Provincial review and their potential impacts on Toronto, City staff recommend delaying decisions on specific beekeeping requirements at this time. Staff will monitor the Provincial review and report back to the Parks and Environment Committee if required.

Review of the City of Edmonton's Backyard Beekeeping Program

Staff from the City of Edmonton were engaged to by the Core Project Team determine the motivation to create the program, how the program works, how the guidelines were developed and participation. The goal was to assess the relevance of this program to the City of Toronto.

Alberta Bee Act

The Alberta Bee Act sets the framework for the beekeeping industry in Alberta. The Act requires registration of beekeepers, authorizes inspection of bees and beekeeping equipment, places controls on the import of bees, and proposes mechanisms for dealing with bee diseases. However, Alberta does not impose restrictions on the locations of hives and does not prescribe training requirements. The City of Edmonton has stricter requirements for beekeeping than the Province of Alberta.

Motivation to create Edmonton permit program

According to staff at the City of Edmonton, there was very little pressure from the community/residents to have hives. The motivation came from Council who wanted to introduce bee hives to help support a sustainable food strategy in urban areas. Edmonton's Backyard Beekeeping Program was initiated as a result of a report and strategy on urban agriculture. The Fresh report - Edmonton’s Food & Urban Agriculture Strategy - was released in 2012 and contained a recommendation to examine opportunities for citizens to keep bees and conduct an evaluation of the implications of allowing urban beekeeping. Edmonton City staff reported their findings to City Council and on April 28, 2015 Edmonton City Council passed an amendment to the Animal Licensing and Control Bylaw to create a permit process to allow beekeeping in the city.

Permit program allows prohibited bees in Edmonton

The Backyard Beekeeping Program contains a permitting process for honey bees that are otherwise banned. Edmonton's Animal Licensing and Control Bylaw currently states honey bees are not permitted. However, the bylaw indicates a prohibited animal is allowed with City Manager permission. This delegated authority made it possible to create a permit program to obtain approval to keep prohibited honey bees. Without a permit the beekeeper contravenes the bylaw, as honey bees are still prohibited.

In designing its permit system, Edmonton City staff consulted experts to determine best practices, conditions, and requirements for participation. Together with partners, a training program was also developed. The result is Edmonton's Urban Beekeeping Guidelines (Appendix 4) that provide best practices and regulations to minimize impact on surrounding neighbours. In addition to applying for a permit, to be a part of the City of Edmonton program, beekeepers are required to adhere to the guidelines.

In 2014, Edmonton initiated the pilot program, resulting in approval of 22 sites for beekeeping. Today, there are 82-84 active hives, with the anticipation of approving more sites as commercial interest is growing.

City of Edmonton program relevance to Toronto
After consultation with the City's Legal Services and input from our advisory groups, staff have concluded that the Edmonton model is not necessary or appropriate for Toronto.

The primary reason is that Toronto's animal by-law (Chapter 349 of the Toronto Municipal Code) does not prohibit honey bees or beekeeping, whereas Edmonton's animal by-law does. Edmonton has guidelines mainly to govern exceptions and exemptions to the ban and create a means to allow for a prohibited animal. Since honey bees are not prohibited in Toronto, a permit program to allow them is not necessary.

Secondly, Toronto is already governed by Provincial beekeeping regulations that are sufficient for the city. Currently, if someone wants to keep honey bees in Toronto, they must follow the guidelines established by the Province. Ontario's laws regarding beekeeping are more comprehensive and include specific setback requirements (unlike Alberta), leaving few gaps for Toronto to fill via a by-law.

Table 2 shows differences between Toronto and Edmonton with regard to beekeeping.

Table 2: Comparison of Toronto and Edmonton with regard to beekeeping

	Toronto	**Edmonton**
Provincial regulations	• The Ontario Bees Act	• The Alberta Bee Act
Status of keeping bees in city	• Not prohibited by City's Animal Bylaws (Toronto Municipal Code Chapter 349)	• Prohibited animal under City's Animal Licensing and Control Bylaw
City regulations	• Not required at this time	• Permit program created to allow prohibited animal
Registration	• Province requires	• Province requires
Location of hives	• Province regulates • Set back restrictions established by the Province	• No Provincial regulations • Set back restrictions established by the City
Neighbour notification	• Province does not require	• Province does not require • City requires notification, not permission
Training requirement	• Province does not require (but may be part of future discussion paper and consultation)	• Province does not require • City requires training and mentorship
Inspections	• Provincial inspectors	• Provincial inspectors • City inspectors

Lastly and perhaps most importantly, considering the potential negative impact that introducing more honey bee colonies could pose to our native pollinators, the City should be cautious about encouraging or incentivizing the introduction of more non-native honey bees. As discussed earlier, the focus should continue to be placed on habitat creation efforts that have benefits to all pollinators, managed and native.

Recommended next steps for beekeeping in Toronto
The following approaches are recommended as next steps for beekeeping in Toronto.

1. Consider results of Provincial review
Due to the fact that sections of the Ontario Bees Act (location of hives, training requirements) will be reviewed by the Province, it is recommended that the City of Toronto delay action on specific beekeeping requirements at this time. If the Province makes changes to the Bees Act, staff will review these changes in consultation with experts and provide further recommendations to this Committee if required.

In the event that the location of hives and setback requirements are removed or relaxed by the Province, the City of Toronto has the option to impose its own setback requirements that meet or exceed those of the Province. This is similar to what the City of Edmonton has done in imposing more restrictions on the location of the hives than the Alberta regulations. However, guidelines imposed by the City must not frustrate the purpose of the Ontario Bees Act. Simply put, Toronto cannot make rules that are less restrictive than the Province. Specifically, the City cannot reduce the setback requirements to allow for more beekeeping in dense urban areas in the city.

In addition, Toronto could mandate neighbour notification, as well as training and mentorship requirements which are not part of the current Ontario law. However, given that Ontario law is undergoing a review at the moment, such features may be added, thereby alleviating the need for Toronto to separately mandate such requirements.

It is important to wait until the Province determines its approach before any of these options can be considered.

2. Encourage informed beekeeping in Toronto
As noted above there are currently 126 registered beekeepers in Toronto, but it is uncertain how many unregistered hives there may be in the city. Recognizing that beekeeping is taking place in Toronto, the City can take efforts to encourage informed beekeeping. This can be achieved by promoting experienced beekeeping groups, such the Toronto Beekeepers Association, that provide training and support for beekeepers.

The City can also take on the development of its own educational programming about bee diversity and habitat in Toronto, with the goal of encouraging all residents to create pollinator habitat where possible. The key message from the City should be that the best way to be a beekeeper in the city is not to keep honey bees, but rather to provide suitable habitats for all (managed and native) bees in the city, by planting wildflowers.

3. Partner with successful beekeeping organizations
The Toronto Beekeepers Collective is active in beekeeping in Toronto. This group is engaged by participating on our Expert Pollinator Advisory Group. The City should continue to seek guidance from this group and others on the issue of urban beekeeping and encourage novice beekeepers to become involved in the training and activities offered by these experienced beekeepers. The Ontario Beekeepers' Association is another group that could offer direction to the City and residents on beekeeping.

4. Continue research and investigation
City staff, with the assistance of the Expert Pollinator Advisory Group, may wish to explore other options to manage beekeeping practices in the city. Recommendations from the advisory group include the establishment of "honey bee free zones" in areas deemed important habitat for sensitive native species, and limiting the number of colonies an individual or individual entity can hold within the city to maintain realistic densities. More research is required to examine the feasibility of these approaches. Opportunities for research partnerships may exist pursuant to Memorandums of Understanding (MOUs) the City will have with various Toronto universities and colleges.

Conclusions and key messages

Taking action to protect pollinators sustains and renews the natural environment and increases its resilience under future global change. Toronto is taking action to protect pollinators through the creation of a Pollinator Protection Strategy. The goal of the strategy is to identify additional actions the City and community can take to ensure that pollinator species found in our city can survive and be sustained. Habitat creation will have a positive impact on all pollinators, and is the foundation of the City's actions.

The primary focus of the strategy is the protection of native bees and butterflies, as evidence suggests that native pollinators are more at risk than non-native honey bees. While there is growing concern about the declining health of the honey bee, the European Honey Bee (*A. mellifera*) is not endangered in Canada. Beekeepers that experience a loss, can order replacement bees. If native bee species are lost, they cannot be replaced.

As requested, a review of Edmonton's beekeeping permit program was also provided. Edmonton's program establishes a permit process that allows for residents to obtain permission keep honey bees, currently a prohibited animal. An analysis of their program has led to the determination that the Edmonton model is not necessary or appropriate in Toronto. Honey bees are not prohibited in Toronto and beekeeping in our city is already regulated under Provincial legislation, which includes specific requirements for beekeeping that are sufficient for Toronto.

In urban centres, where habitat is limited, the introduction of non-native bee species may negatively impact populations of native pollinators. The City should therefore continue to focus on habitat creation efforts that have benefits for all pollinators, and be cautious about encouraging the introduction of more non-native honey bees.

While a great deal of work has been done to date, there are several additional actions which will be taken in 2017 to finalize the strategy, including continued public engagement and additional research. The final Pollinator Protection Strategy will be presented by the end of 2017, as part of the City's broader Biodiversity Strategy, being led by City Planning.

CONTACT

Jim Baxter, Director, Environment & Energy Division, Telephone: 416-338-1295
E-mail: jbaxter2@toronto.ca

Annemarie Baynton, Environment & Energy Division, Telephone: 416-392-1848
E-mail: abaynto@toronto.ca

SIGNATURE

Josie Scioli
Chief Corporate Officer

ATTACHMENTS

Appendix 1: Inventory of City of Toronto activities to support healthy pollinator populations
Appendix 2: Draft best practices - Tips on creating a bee and butterfly friendly garden
Appendix 3: Draft Pollinator Protection Strategy for public consultation
Appendix 4: City of Edmonton's Urban Beekeeping Guidelines