Clause 12 in Report No. 13 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on October 19, 2017.

12

Annual Update on Invasive Species

Committee of the Whole recommends adoption of the following recommendations contained in the report dated September 20, 2017 from the Commissioner of Environmental Services:

1. The Regional Chair write a letter to the Minister of Environment and Climate Change Canada, and to the Provincial Minister of Natural Resources and Forestry expressing concern about invasive species and request funding for municipalities to assist with mitigating the impacts of invasive species.

2. The Regional Clerk circulate this report to the local municipalities, Toronto and Region Conservation Authority, Lake Simcoe and Region Conservation Authority, Ministry of Natural Resources and Forestry, Canadian Food Inspection Agency and Environment and Climate Change Canada.

Report dated September 20, 2017 from the Commissioner of Environmental Services now follows:

1. Recommendations

It is recommended that:

1. The Regional Chair write a letter to the Minister of Environment and Climate Change Canada, and to the Provincial Minister of Natural Resources and Forestry expressing concern about invasive species and request funding for municipalities to assist with mitigating the impacts of invasive species.

2. The Regional Clerk circulate this report to the local municipalities, Toronto and Region Conservation Authority, Lake Simcoe and Region Conservation Authority, Ministry of Natural Resources and Forestry, Canadian Food Inspection Agency and Environment and Climate Change Canada.

2. Purpose

This report provides an update on Emerald Ash Borer and other priority invasive species in York Region and seeks authority to request provincial and federal funding to assist with mitigating impacts associated with invasive species.

3. Background and Previous Council Direction

Invasive species in Ontario and York Region are a growing environmental and economic concern

Ontario has more invasive species than any other province or territory in Canada (over 660 known species). In 2017, the Ministry of Natural Resources and Forestry (MNRF) announced increased funding for partner organizations (e.g. Invasive Species Centre, Invading Species Awareness Program, Federation of Ontario Cottagers' Association) to continue the fight against invasive species including new funding for the Ontario Invasive Plant Council so they can engage municipalities in developing municipal invasive plant management strategies. However, municipalities continue to face significant costs associated with invasive species. At present, the MNRF does not have an accurate estimate of all economic impacts associated with invasive species in Ontario. In a 2017 Michigan study, speaking only to aquatic invasive species, the total economic impact costs the state an estimated $5.7 billion a year.

Over the last year, Regional efforts focused on implementation priorities under applicable legislation, including the provision of the *Invasive Species Act*, *2015* and the *Weed Control Act, 1990*. In addition, where threats to Regional assets exist, site-specific actions are implemented to mitigate invasive species impacts (e.g. zebra and quagga mussels at water intakes, dog-strangling vine in the York Regional Forest, etc.).

While the federal and provincial governments provide some funding to partner agencies like the Invasive Species Centre and Ontario Invasive Plant Council, there is currently no direct funding to municipalities working to manage the threat and impacts of invasive species.

In June 2011, Council endorsed an Emerald Ash Borer Management Plan for York Region

At its meeting on June 23, 2011, Council adopted an Emerald Ash Borer Management Plan outlining an active management approach. The emerald ash borer will likely always be present; however, over the next 10 to 15 years, with a diminished food supply (ash trees) and the impact of natural and introduced predators (e.g. parasitic wasps), their numbers will likely decline.

York Region collaborates with local municipalities, provincial and federal governments, non-governmental organizations and academia to manage invasive species

Since 2008, York Region has worked with its partners to raise awareness of the emerald ash borer and other invasive species, and to prevent and mitigate adverse effects of invasive species on tree canopy and woodland cover.

Staff participate on boards for the Invasive Species Centre and Forests Ontario, and also participate on the Communications Committee of the Ontario Invasive Plant Council. Region staff also chair the Regional Public Works Commissioners of Ontario (RPWCO) Urban Forest Sub-committee, which provides a forum for staff to share experiences with other public works jurisdictions in Ontario.

York Region staff chair the Invasive Species Technical Working Group that includes representatives from local municipalities, conservation authorities, surrounding jurisdictions including the Chippewas of Georgina Island First Nation, and the federal and provincial governments. Topics include updates on ash tree removal and replacement and other priority invasive species e.g. Asian long-horned beetle, hemlock woolly adelgid, and dog-strangling vine.

In 2016, the Ontario government enacted the *Invasive Species Act, 2015*. The Act includes provisions to restrict possession, propagation and movement of regulated invasive species, and requires management plans be enacted when a regulated species is discovered. Staff will continue to participate in reviewing regulatory proposals and track new species listings.

4. Analysis and Implications

Region remains proactive in its approach to assess, prevent and mitigate the impacts of emerald ash borer and other invasive species

Staff continue with proactive management to mitigate the impacts of emerald ash borer:

- Removal of 12,701 ash street trees to-date, including 1,189 in 2017. The majority of ash street trees have been removed and sweeps are on-going.
- Ash street trees removed from Regional roads are being replaced with trees of a different species on a one-to-one basis in each local municipality. In 2017, a total of 652 ash trees were replaced along Regional roads.

- In the York Regional Forest, approximately 13,500 hazard ash trees have been marked for removal near trails, parking lots, and shared boundaries. A total of 4,563 ash trees have been removed to date. Remaining removals will take place in 2018 and 2019 on a prioritized basis.

- Three ash street trees were added to the tree protection program (TreeAzin™) in 2017, and three ash trees in the York Regional Forest received their second treatment. The majority (213) ash trees will be treated again in 2018.

- In 2017, a specific plan was prepared to guide ash tree harvesting in the Brown Hill Tract of the York Regional Forest in 2018. Underplanting will be carried out where the loss of ash is significant.

Many other invasive insects and plants continue to impact or pose a threat to the Region's urban landscapes and natural areas. Priority invasive species in York Region are identified where they pose a significant risk based on potential impacts to; residents, Regional assets, natural heritage and public health.

Staff liaise with agencies including federal and provincial governments, Ontario Invasive Plant Council, Invasive Species Centre, and other municipalities, to keep informed.

York Regional Forest is a research site for biological control of Emerald Ash Borer

In 2015, Natural Resources Canada selected the York Regional Forest as a part of a larger biological control program for emerald ash borer. Two species of tiny (2-4 mm), stingless wasps have been approved for release in Canada and pose no threat to humans. Larval wasps destroy emerald ash borer eggs and larvae. 2017 marks the third consecutive year of releases in the York Regional Forest. Biological control is an effective part of the solution to control introduced invasive species, and has been successful in the past (e.g. purple loosestrife, gypsy moth).

Federal government is monitoring Regulated Area close to York Region border for Asian long-horned beetle

In late 2013, a new Asian long-horned beetle infestation was confirmed in the City of Mississauga near Pearson International Airport. A new Regulated Area encompassing parts of the Cities of Toronto and Mississauga was established. The quarantine may be lifted in 2019 if monitoring demonstrates that no new finds are detected.

York Region participates in hemlock woolly adelgid (invasive insect) working group

Hemlock woolly adelgid, a tiny (0.8 mm) invasive insect that has killed billions of hemlock trees in the northeastern United States, has previously been detected (2012, 2013) at two sites in southern Ontario (Etobicoke and Niagara). The CFIA destroyed the infested trees and are monitoring the sites. No new detections have been found since 2015. It is expected hemlock woolly adelgid will eventually spread throughout Ontario. Though hemlock is not planted as a street tree, it is found in forests throughout York Region and is present in 13 per cent (290 hectares) of the York Regional Forest.

Staff participate in a working group to gather and share information on the threat of this insect to southern Ontario forests and how best to detect it, prevent its spread and manage its impacts.

City of Toronto, Mississauga and Town of Oakville treating trees for Gypsy Moth infestation

Gypsy moth, native to Europe and Asia, was first discovered in Ontario in 1969. The moth's larval stage (caterpillar) aggressively eats the leaves of trees (prefers oak) making them more susceptible to disease and other environmental stresses. Gypsy moth populations naturally peak every seven to eight years. The City of Toronto and Town of Oakville were reporting in late 2016 a prediction of a peak infestation for 2017. In anticipation of an infestation outbreak the City received Council approval to aerial spray with a biological insecticide (Btk), which was carried out in late May through early June. The City of Mississauga and Town of Oakville opted for ground-level treatments. York Region staff have been monitoring gypsy moth population levels within the Region but have not observed any significant infestations. Staff will remain vigilant and continue to monitor the situation.

Invasive plants continue to impact natural landscapes in York Region

Invasive plants, including giant hogweed, dog-strangling vine, European buckthorn and garlic mustard, impact natural and agricultural areas throughout York Region. More recently, an increase in observations of wild parsnip, European common reed (Phragmites) and Japanese knotweed along Regional road right-of-ways have been documented. Staff are working in partnership with Roads Maintenance staff on implementation of best practices to reduce the impact of these species.

Invasive plant control in the York Regional Forest has been on-going since 2014 with some success in treated areas, particularly for dog-strangling vine. In 2017, control efforts took place in a total of eight York Regional Forest tracts following

best management practices. Additional areas will be targeted for invasive plant control in 2018.

Advancing biological control of dog-strangling vine in the York Regional Forest and beyond

The Canadian Food Inspection Agency has approved the release of a biological control insect that feeds on invasive dog-strangling vine. The Hypena moth caterpillar carries out its lifecycle by feeding only on dog-strangling vine. In 2015, 2016 and 2017 Hypena caterpillars were released at sites in the York Regional Forest as part of a research project partnership with the University of Toronto, Agriculture and Agri-Food Canada, and a private company. The sites are being monitored to assess their effectiveness.

Aquatic invasive species continue to threaten Lake Simcoe

There are currently 48 known invasive aquatic species threatening the health and function of our watersheds and Lake Simcoe. The following are some priority invasive species:

- Invasive mussels: Lake Simcoe Region Conservation Authority has reported a decline in zebra mussel populations but a corresponding increase in quagga mussels. Recently, the Region has made operational changes to water intake systems to adapt to increasing levels of quagga mussels.

- Invasive fish: The round goby was first introduced to Lake Simcoe in 2005 and has been responsible for the decline of native fish species. Current round goby populations show no signs of decreasing in Lake Simcoe, despite reports of native fish feeding on them.

- Invasive plants: Water soldier was first discovered in late 2015 in the Black River near Lake Simcoe in the Town of Georgina. The introduction of this plant to the lake could impact recreational activities and its overall health. The Ministry of Natural Resources and Forestry continues to work to eradicate satellite populations as they are discovered along the river.

Extensive public outreach provides tools and options to residents to help manage Emerald Ash Borer and other invasive species

Invasive species awareness and education are part of Environmental Services public outreach programs. Events have included invasive plant and emerald ash borer management workshops for woodlot owners and information sessions for urban residents. Emerald ash borer information is available at www.york.ca/eab. Some outreach highlights for 2017 include:

- Woodlot Owner Advisory Program pilot in partnership with Forests Ontario to provide information and resources for woodlot owners managing the impacts of emerald ash borer (www.forestsontario.ca/eabyork).

- Early Detection and Rapid Response Workshop hosted in partnership with the Ontario Invasive Plant Council to help the public monitor the distribution of invasive species using the online Early Detection and Distribution Mapping System (www.eddmaps.org/ontario) (April 29).

- Invasive Plant Management Strategy Workshop hosted in partnership with Simcoe County and the Ontario Invasive Plant Council for local municipal staff (September 19).

- Partnership with Local Enhancement and Appreciation of Forests (LEAF) planted 342 trees and shrubs through backyard tree planting program and 15 in-class invasive forest pest workshops with 384 participants.

- Invasive species outreach and education through forestry and greening supported events: over 5,900 residents engaged to-date.

5. Financial Considerations

Budget supports overall program and priority removal and replacement of ash street trees

Currently, the majority of costs associated with emerald ash borer are to protect, remove and replace ash street trees along Regional roads. The overall 10 year budget and expenditure forecast (2012–2021, $10 million) for emerald ash borer management remains on track. The accelerated pace of ash tree loss was reported in the November 2013 Emerald Ash Borer Update to Council, and based on this report the budget outlook for 2014 and beyond was adjusted. Removing and replacing ash trees on Regional roads is on track and on budget. From 2012 to the end of 2017, approximately $6 million will have been spent as the Region manages through the peak of the infestation.

Any additional budget pressures associated with emerging invasive species impacts will be brought forward for Council's consideration as a part of future budget processes. Staff will continue to monitor latest research and reports from the Federal and Provincial governments as well as neighbouring jurisdictions, and support long-term research initiatives.

Invasive species will continue to have impacts on York Region and its residents

The impact of emerald ash borer and other invasive species will continue to have significant financial implications for the Region and its residents. As the Region is experiencing ongoing financial consequences associated with existing and emerging invasive species, it is proposed that the Region request financial assistance from both the federal and provincial governments to ensure that all three levels of government share equally the costs of managing the impacts of invasive species (e.g. one third federal funding, one third provincial funding, one third municipal funding).

6. Local Municipal Impact

All nine local municipalities have Emerald Ash Borer Management Plans or implementation strategies, which align with Regional interests or are working on implementation strategies. The Region focuses on managing impacts to Regional assets (e.g. street trees along Regional roads, York Regional Forest properties) and local municipalities focus on their street trees on local roads, parklands, etc. Jurisdictions work collaboratively on communications and outreach initiatives. Most local municipal plans include removing and replacing trees, with some protection of select trees with insecticide.

The Invasive Species Technical Working Group provides a forum for sharing knowledge about emerald ash borer as well as other invasive species. York Region staff will continue to collaborate with local municipalities in monitoring, prevention, education and outreach activities.

7. Conclusion

Emerald ash borer is present throughout York Region and is killing millions of ash trees in urban and natural landscapes. Efforts to manage and mitigate the emerald ash borer's impacts will continue by implementing the Emerald Ash Borer Management Plan, including removing and replacing street trees and mitigating the impact on the York Regional Forest, as well as public education and outreach.

Other invasive insects and plants such as Asian long-horned beetle, hemlock woolly adelgid, dog-strangling vine, and Japanese knotweed continue to emerge as real or potential threats to the Region's urban and natural areas, or as with giant hogweed and wild parsnip, can pose threats to health of residents.

Equally sharing costs of managing impact of invasive species with federal and provincial governments supports more proactive response

Staff remain vigilant and continue to work with local municipalities, other levels of government and non-profit organizations to review emerging threats and work proactively to prevent and respond to the impacts of invasive species. While some federal and provincial funding is currently provided to partner agencies like the Invasive Species Centre and Ontario Invasive Plant Council, staff recommend that both the federal and provincial government agencies provide direct funding for municipalities who are working on the front-line to manage invasive species and to share equally the costs of managing the impacts of invasive species.

For more information on this report, please contact Ian Buchanan, Manager, Natural Heritage and Forestry at 1-877-464-9675 ext. 75204 or Laura McDowell, Director, Environmental Promotion and Protection at ext. 75077.

The Senior Management Group has reviewed this report.

September 20, 2017

Attachment

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Accessible formats or communication supports are available upon request

PRIORITY INVASIVE SPECIES
in York Region

Attachment 1

Asian long-horned beetle life stages egg - adult beetle.
Photo Credit: K.R. Law, USDA APHIS PPQ, Bugwood.org

ASIAN LONG-HORNED BEETLE *(Anoplophora glabripennis)*

ORIGIN: Native to Asia and can be introduced into Canada with infested wood packaging material (e.g. wooden pallets, crates, boxes, etc.).

IMPACTS: Adults lay their eggs in hardwood trees, and larvae then tunnel through the living tissue of the tree stopping the flow of water and nutrients, killing it.

Host tree species preferred by Asian long-horned beetle include birch, maple, elm, poplar, willow and mountain ash.

WHERE: Regulated area in Toronto and Mississauga
map: *inspection.gc.ca*

M. Prue, Ohio Department of Natural Resource

EMERALD ASH BORER *(Agrilus planipennis)*

ORIGIN: Native to Asia, proven to be highly destructive in its introduced range.

IMPACTS: Adults lay their eggs in ash trees, and larvae then tunnel through the living tissue of the tree stopping the flow of water and nutrients, ultimately killing it, usually within three years.

Host tree species preferred by emerald ash borer are green, black, white, blue and European ash (Fraxinus spp.)

WHERE: Spreading north throughout Ontario (regulated area includes Sudbury, ON)

Photo Credit: J. Mehrhoff, University of Connecticut, Bugwood.org

WILD PARSNIP *(Pastinaca sativa)*

ORIGIN: Native to Eurasia. Likely brought to North America by European settlers, who grew it for its edible root.

IMPACTS: Can form dense stands and spreads quickly in disturbed areas such as abandoned yards, waste dumps, meadows, open fields, roadsides and railway embankments. Its seeds are easily dispersed by wind and water and by mowing or other equipment.

Like giant hogweed and other members of the carrot family, it produces sap containing chemicals that can cause human skin to react to sunlight, resulting in intense burns, rashes or blisters.

WHERE: Spreading rapidly in southern Ontario, with an increase in sightings along roadsides in York Region

Gypsy moth caterpillar defoliating oak leaf
Photo Credit: F. Lakatos, University of West Hungary, Bugwood.org

Male and female adult gypsy moth
Photo Credit: USDA, APHIS, Bugwood.org

ORIGIN: Native to Europe and Asia, gypsy moth was first introduced to North America in the late 1860's in Boston and it has been spreading ever since. Gypsy moth was first discovered in Ontario in 1969 however widespread defoliation did not occur until 1981.

IMPACTS: This European defoliator feeds on a wide variety of tree species but appears to prefer oak (Quercus). The moth's larvae form (caterpillar) feeds aggressively on the tree's leaves, reducing growth and, in severe cases, killing the tree. Gypsy moth outbreaks occur every 7 to 10 years with peak feeding observed in July.

WHERE: The distribution of gypsy moth coincides with the range of the insect's preferred host species of oak however, no known populations of the insect have been found in the northern-most part of the oak species' range (e.g. New Liskeard and west of Thunder Bay). The gypsy moth is considered otherwise, to be present throughout much of southern Ontario.

Adelgid nymph feeding on hemlock leaves (black spots)

Adelgid nymphs with white woolly covering feeding on underside of hemlock needles
Photo Credit: Connecticut Agricultural Experiment Station, Bugwood. org

HEMLOCK WOOLLY ADELGID *(Adelges tsugae)*

ORIGIN: Native to Asia

IMPACTS: The hemlock woolly adelgid nymph feeds on the tree's stored starches, depleting its energy stores and thus damaging to the tree.

The insect is inactive through much of the summer, resuming feeding and development in the fall. During this time, the nymph produces its distinctive woolly white covering. Hemlock woolly adelgid are small in size and only their woolly coverings are easily visible to the naked eye.

WHERE: Found in isolated locations in Ontario in 2012 and 2013, but these infested trees were removed and the adelgid is not yet known to be established in eastern Canada.

PRIORITY INVASIVE SPECIES
in York Region

Dense patch of dog-strangling vine
Photo Credit: A. Hicks, Ontario Federation of Anglers and Hunters

Seed Pods
Photo Credit: G. Bales, MNRF

DOG STRANGLING VINE *(Vincetoxicum rossicum)*

ORIGIN: Native to Eurasia, introduced to the northeastern United States in the mid 1800s for use in gardens.

IMPACTS: Forms dense stands that overwhelm and crowd out native plants and young trees, preventing forest regeneration. This is a serious concern for the conifer plantations in the York Regional Forest.

Leaves and roots may be toxic to livestock. Deer and other browsing animals also avoid dog strangling vine, which can increase grazing pressure on more palatable native plants.

This vine also poses a threat to monarch butterfly populations; butterflies lay their eggs on the plant but, the larvae are unable to successfully complete their life cycle.

WHERE: Currently it is finding its way into our backyards and natural areas across York Region at an alarming rate, as it produces seeds that are easily carried by the wind over great distances.

Photo Credit: Miriam King, Bradford Times/ Sun Media

EUROPEAN COMMON REED *(Phragmites australis)*

ORIGIN: Native to Eurasia but introduced to the eastern seaboard in the early 19th century.

IMPACTS: An aggressive perennial grass that has been damaging ecosystems in Ontario for decades. The plant grows very quickly to heights of almost 5 metres (15ft) tall which crowds out native vegetation resulting in decreased plant biodiversity in turn impacting native wildlife populations. Dense stands of the plant can even lower water levels in ponds and wetlands. Along roads, the plant can pose as a safety hazard by covering road signs and blocking sight lines.

WHERE: Increased sightings throughout York Region most prominently along road sides and in ditches.

PRIORITY INVASIVE SPECIES
in York Region

Photo Credit: D. Cappaert, Michigan State University, Bugwood.org

GARLIC MUSTARD *(Alliaria petiolata)*

ORIGIN: Herb native to Europe

IMPACTS: Can invade relatively undisturbed forests. Once established it can displace native wildflowers like trilliums and trout lily (Erythronium americanum). It hinders other plants by interfering with the growth of fungi that bring nutrients to the roots of the plants.

Threatens several of Ontario's species at risk, including American ginseng (Panax quinquefolius).

WHERE: Established in southern and eastern Ontario (throughout York Region) as far north as Sault Ste. Marie, in parts of Quebec, and south to North Carolina and Kentucky in the United States.

Photo Credit: J. Ferreira, City of Brampton

GIANT HOGWEED *(Heracleum mantegazzianum)*

ORIGIN: Southwest Asia (Caucasus Mountains)

IMPACTS: Poses a significant threat to human health. Giant hogweed sap can cause a condition called phytophotodermatitis, which makes skin extremely sensitive to sunlight, and can result in severe burns and blisters. It also outcompetes native plants, reduces biodiversity and degrades the quality of riparian habitats (the zone of land along or around a body of water). Giant hogweed can negatively impact agriculture and is listed as a noxious weed under the Weed Control Act.

WHERE: Sparsely scattered throughout York Region (and all of Southern Ontario). Confirmed reports as far north as Sudbury and Elliot Lake.

Photo Credit: R. Westbrooks, Invasive Species Prevention Specialist, Bugwood.org

JAPANESE KNOTWEED *(Fallopia japonica)*

ORIGIN: Plant is native to eastern Asia and was first introduced into North America in the late 1800s.

IMPACTS: Commonly invades disturbed areas with high light, such as roadsides and stream banks. Reproduction occurs both vegetatively (rhizomes) and seeds, making this plant extremely hard to eradicate. The dense patches shade and displace other plant life and reduce wildlife habitat.

WHERE: Increased sightings throughout York Region, road sides and fields.