



STAFF REPORT ACTION REQUIRED

Forest Health Care – Invasive Exotic Pests

Date:	December 17, 2007
To:	Parks and Environment Committee
From:	Brenda Librecz, General Manager, Parks, Forestry and Recreation
Wards:	All
Reference Number:	

SUMMARY

This report reviews issues associated with three invasive exotic tree pests currently found in Toronto.

Asian Longhorned Beetle was first found in Ontario in 2003, when it was identified on both sides of the border between Toronto and Vaughan. Since then the Canadian Food Inspection Agency (CFIA) has implemented a control program aimed at eradication. This report provides an update on the eradication program, including recently revised protocols. More tree cutting and more intensive surveys are proposed to ensure eradication goals are achieved.

Emerald Ash Borer was first found in Ontario in 2002 when it was identified on both sides of the border between Windsor and Detroit, U.S.A. Since then, the CFIA has worked to control the spread of the pest through regulation and a strategy of cutting a firebreak in advance of the easterly spreading front. This report gives an update on the currently known EAB infested areas and describes the current spread of the pest to Toronto and the CFIA's and Urban Forestry's response with regard to tree removal services and processing of wood waste in regulated zones.

Gypsy moth is an invasive alien pest that was first found in Ontario in 1969 and whose population fluctuates in relation to environmental and biological controls. Outbreak population levels were found in parts of Toronto in 2006. Aerial and ground spray of a biological pesticide was used to control pockets of infestation in 2006 and 2007. The results of the control program are described along with the proposed control program for 2008.

Ensuring the protection of healthy trees is an essential adaptation strategy to mitigate rapid climate change, for protection of human health and ecosystem health. The presence of invasive exotic pests continues to impact the health of the urban forest, and has potential to significantly increase tree mortality and maintenance requirements in future. A dedicated fund is required to ensure adequate resources are applied to invasive alien pest control, as well as to minor pests such as Eastern Tent Caterpillar.

RECOMMENDATIONS

The General Manager of Parks, Forestry and Recreation recommends that:

1. Council communicate the concerns about the Asian Long-Horned Beetle, through the City Clerk, to the Honourable Donna Cansfield, Minister of Natural Resources, and to the Honourable Gerry Ritz, Minister of Agriculture and Agrifood, responsible for the Canadian Food Inspection Agency, and that the Federal Government be requested to maintain or increase financial support for the ALHB eradication program in the Toronto area;
2. Council communicate the concerns about the Emerald Ash Borer, through the City Clerk, to the Honourable Gerry Ritz, Minister of Agriculture and Agrifood, responsible for the Canadian Food Inspection Agency, and that the Federal Government be requested to quickly implement regulations to control the spread of Emerald Ash Borer to give private industry and the City time required to develop and implement mechanisms needed to process the landscape waste within the regulated zones, as well as to develop public awareness programs;
3. Facilities and Real Estate staff work with Solid Waste staff to identify yard space available to process infested wood and yard waste;
4. Solid Waste staff work with Urban Forestry staff to review the issue of increased volume of wood waste associated with ash tree removal, to determine appropriate use of end product;
5. Urban Forestry staff implement, if determined necessary in outbreak areas of Gypsy Moth infestation, in 9 Wards (4, 7, 8, 9, 13, 25, 26, 27 and 29) an integrated pest management (IPM) program involving aerial and ground spray of a biological control agent, *Bacillus thuringiensis* subspecies *kurstaki* (*Btk*), and mechanical egg mass removals; such program to include both City and privately owned trees, to control the larval stage of the European gypsy moth which causes defoliation of trees;
6. Urban Forestry staff consult with Public Health, Transportation Division and Police Services to coordinate the implementation of the proposed aerial and ground-based application of the biological control agent Btk;
7. The City Solicitor be authorized to introduce a bill to implement a control strategy for gypsy moth infestation through ground based and aerial spraying;

8. Finance Division assist Urban Forestry staff in billing and collection of voluntary payments from residents to offset a portion of the cost of the control measures for Gypsy moth;
9. City Council authorize staff to enter into sole source contracts with Zimmer Air to conduct aerial spray operations and with Bioforest Technologies to coordinate the aerial spray program, as part of the overall gypsy moth control program; and
10. The appropriate City Officials be authorized and directed to take the necessary action to give effect thereto.

Financial Impact

There are no financial implications resulting from the adoption of this report.

DECISION HISTORY

Previous reports have been written dealing with the Asian Longhorned Beetle, Emerald Ash Borer and Gypsy Moth. Council recommendations in these reports required that further updates be provided to Council to report on new finds and control programs. Relevant reports can be accessed through the following links:

Asian Longhorned Beetle (ALHB)

Preliminary Report – Pre-discovery in Toronto

<http://www.toronto.ca/legdocs/2000/agendas/council/cc/cc000509/edp5rpt/cl001.pdf>

September '03 Motions at Council

[http://www.toronto.ca/legdocs/2003/agendas/council/cc030922/nomj\(27\).pdf](http://www.toronto.ca/legdocs/2003/agendas/council/cc030922/nomj(27).pdf)

December '03 Motions at Council

<http://www.toronto.ca/legdocs/2003/minutes/council/cc031202.pdf>

January '04 Status Report - To report as requested by City Council at its December 2, 2003 meeting on the Asian Long-horned Beetle (ALHB) eradication plan, funding status, long-term re-forestation strategy and a public awareness strategy for the citizens of the City of Toronto.

<http://www.toronto.ca/legdocs/2004/agendas/committees/edp/edp040202/it006.pdf>

January '04 - A further report to the Board of Health provides information on the possible use of pesticides to prevent the further spread of the Asian Longhorned Beetle infestation in Toronto.

<http://www.toronto.ca/legdocs/2004/agendas/committees/hl/hl040119/it005.pdf>

March '06 Financial Report - To confirm the current and future Partnership Agreement between the City of Toronto and the Canadian Food Inspection Agency (CFIA) which provides for the reimbursement of all costs for survey, removal and disposal of infected trees associated with the Asian Long-horned Beetle (ALHB) Eradication Program.

<http://www.toronto.ca/legdocs/2006/agendas/committees/pof/pof060327/it001m.pdf>

Emerald Ash Borer (EAB)

March '03 - To provide information on Emerald Ash Borer (EAB), which has infested ash trees in Essex County, Ontario and in south eastern Michigan. The expected impacts to Toronto are discussed.

<http://www.toronto.ca/legdocs/2003/agendas/committees/edp/edp030324/it005.pdf>

June '06 - To provide an update on the infestation of the Emerald Ash Borer in south western Ontario and the actions being taken by the Federal Government to control the invasive insect spread.

<http://www.toronto.ca/legdocs/2006/agendas/committees/edp/edp060706/it017.pdf>

Gypsy Moth

January '07 - To describe the presence of confirmed outbreak levels of the European gypsy moth in some areas of the City of Toronto. Background information describes past approaches for control.

<http://www.toronto.ca/legdocs/mmis/2007/pe/bgrd/backgroundfile-721.pdf>

ISSUE BACKGROUND

Forest pests affect tree health. Pests that are native to a region typically have natural controls that prevent catastrophic damage to trees. Pests that are introduced from other regions, including Asian Longhorned Beetle (ALHB), Emerald Ash Borer (EAB) and European Gypsy Moth (EGM), do not have effective natural controls and are, therefore, a greater threat to Canada's forests. Each of the above pests is unique in terms of their potential risk and the possibility of control. For this reason, practices to control the pests vary as described in this report.

Under the *Plant Protection Act*, the Canadian Food Inspection Agency (CFIA) is responsible for preventing the entry and spread of pests of quarantine significance into Canada. The CFIA has the authority to conduct eradication projects and has regulatory authority in the control of pest situations. The CFIA has implemented action plans for Asian Longhorned Beetle (ALHB) and Emerald Ash Borer (EAB) for greater Toronto. In the case of ALHB they have taken action to eradicate all known infestations and finding any undetected infestations. On the ground, the eradication project consists of four activities – survey, containment, treatment and replanting. In the case of EAB, CFIA have taken action to slow further spread of the pest by regulating the movement of potentially infested materials, and by finding infestations.

European Gypsy moth is recognized by CFIA as an important exotic forest pest and information is included in their Exotic Forest Insect Guidebook (2006). This pest is regulated by CFIA, however because of its widespread distribution, CFIA is not involved in implementation of control programs.

COMMENTS

ASIAN LONGHORNED BEETLE (ALHB)

Asian Longhorned Beetle was first found in Ontario in 2003, when it was identified on both sides of the border between Toronto and Vaughan. Since then the Canadian Food Inspection Agency (CFIA), together with partners, has implemented a program aimed at eradication.

Urban Forestry last reported to update Council on the ALHB control program in 2005. At that time it was reported that CFIA inspection teams were continuing to find infested trees both in Toronto and Vaughan within the Regulated Area. After each new find, the infested trees, as well as all host trees within 400 metres of these trees, were removed to prevent the spread of the ALHB. Approximately 12,000 trees were removed in 2005 from residential, commercial and industrial properties, including a cemetery. The trees were studied and the data collected has been used to strengthen the ALHB Action Plan.

The monitoring phase of the eradication program continued after 2005. In February, 2007, inspection teams detected sixteen trees infested with the ALHB within the Regulated Area in the City of Toronto. These trees were the first infested trees detected since September 2005. Based on the latest scientific information provided by the CFIA and the Canadian Forest Service, and on the recommendations of the ALHB Science Panel, the CFIA adopted a new, modified protocol to deal with small scale, remnant infestations. Results of research data suggest that the beetle's host preference in Toronto's environment is targeted at fewer tree species than previously thought; therefore the focus of the survey and removal was given to tree species that are most frequently attacked. It was also recommended that the removal zone around the remnant infestations be modified in close association with monitoring. Implementing adjustments to former protocols, the CFIA completed the removal of 2400 trees in the Finch Avenue West and Weston Road area during January and February 2007.

In June 2007, the inspection team detected a number of trees infested with the ALHB in two new areas of the City of Toronto. The infested trees were located on predominantly residential and commercial properties in the Jane Street and Finch Avenue and Jane Street and Sheppard Avenue areas. These affected areas are within the existing regulated area; therefore, no additional regulatory restrictions are required. A removal zone of 200 metre radius from infested trees was implemented, resulting in the removal of 900 trees in October, 2007.

To date, approximately 27,400 trees have been removed in the continued effort to eradicate the ALHB in Toronto and Vaughan. The CFIA offered compensation to property owners for trees ordered destroyed to prevent the spread of the Asian Long-Horned Beetle. Compensation is provided on the basis of the direct cost of replacing a

tree up to a maximum amount of up to \$300 per tree ordered destroyed on privately owned property; \$150 per tree ordered destroyed on public property; and \$40 per tree ordered destroyed in woodlots.

The CFIA continues to work with the City of Vaughan; City of Toronto; other federal, provincial and municipal partners; and stakeholders in the effort to eradicate the ALHB. The existing Partnership Agreement is in place until March 31, 2008 and will be renewed for another year before the expiry date of the existing agreement.

Successful eradication of ALHB is no less important today than it was in 2003 when first detected. Although it was disappointing to discover additional infested trees in 2007, the fact that these trees were found in limited numbers and by the ongoing surveys being conducted by CFIA and City of Toronto staff is evidence of the continued importance of an effective monitoring program. A new model for survey operations in the regulated area during the monitoring phase has been subsequently developed to enhance the chances of the early detection of any remnant or new infestation and mitigate the risk of the spread. The survey model divides the regulated area into 2,056 survey cells having differing intensity of inspection based on risk of ALHB infestation. The City of Toronto is working to both increase the number of personnel assigned to the program of continued survey, as well as to consider options for diversifying the work assigned to the full time survey staff in an effort to reduce burn-out resulting from the repetitive tasks associated with looking through binoculars for signs of beetle damage.

Given the importance of continued support for the ALHB eradication program, it is recommended that the City Clerk communicate the concerns of Council about Asian Long-Horned Beetle to the Honourable Donna Cansfield, Ontario Minister of Natural Resources; and to the Honourable Gerry Ritz, Minister of Agriculture and Agrifood, responsible for the Canadian Food Inspection Agency, and that the Government of Canada be requested to maintain or increase financial support for the ALHB eradication program in the Toronto area in order to increase ALHB detection efforts.

EMERALD ASH BORER (EAB)

EAB is an introduced wood-boring beetle native to China, Japan, Korea, Russia and Taiwan that poses a significant threat to forests and forest industries. It was discovered in North America in Detroit, Michigan in 2002 and in Windsor, Ontario in 2003. It is likely that all species of ash, both native and exotic are susceptible to EAB.

Since 2003 the CFIA has worked to slow the spread of the pest through regulation and a strategy of cutting a firebreak in advance of the easterly spreading front. Urban Forestry last reported to Council in June 2006 on the infestation of the EAB in south western Ontario and the actions being taken by the Government of Canada to slow the spread for this invasive insect. At the time of that report it was stated that despite massive efforts of governments in the U.S.A. and Canada to contain and slow EAB infestation, efforts to stop the spread were unsuccessful. The possibility of this invasive alien pest spreading to

the GTA was very high, particularly if beetles would be accidentally introduced through transport of infested ash wood products.

Between December 2006 and November 2007 it was reported that CFIA had regulated zones around EAB infested trees in London Ontario, and Norfolk County in addition to the five regulated areas in South-western Ontario, including Essex County, Municipality of Chatham-Kent, Lambton County and Elgin County. Regulated materials cannot be moved outside of a regulated area without prior written permission from the CFIA. Anyone violating this requirement may be subject to a fine and/or be liable for prosecution.

In November 2007, the presence of Emerald Ash Borer (EAB) was confirmed in Toronto in the vicinity of Sheppard Avenue East and Highway 404. The infested trees in Toronto were detected by Ontario Ministry of Natural Resources staff and have been confirmed positive for EAB by CFIA laboratory analysis.

The CFIA will continue to work with its partners and stakeholders to determine next steps based on the most current scientific advice. Canadian Food Inspection Agency (CFIA) is conducting a survey in a five-kilometre radius around the infested trees to determine the extent of the infestation. CFIA will implement restrictions on properties within a five-kilometre radius from where EAB was detected to stop the movement of potentially infested materials that may harbour the insect. Affected property owners will be notified by the CFIA of these restrictions. Birchmount Yard will be used to process ash logs cut by Toronto Urban Forestry operations within the five-kilometre quarantine zone.

EAB has a one to two year life cycle – adults are observed from June to August; eggs are laid in bark crevices, and larva chew through the bark and into the cambium. The larva feeds on the cambium, interrupting the flow of nutrients in the inner bark and girdling (killing) the tree. The pest is currently in its dormant period and will not spread naturally during the winter months.

Impacts of EAB on Toronto Urban Forestry Services

EAB spreads very fast and is extremely difficult to detect until trees are heavily infested. It is therefore expected that EAB will spread throughout Toronto within a period of about five years, causing a significant increase in maintenance services. The disposal of wood within quarantine zones will be costly due to the need to process all wood into chips. Toronto Urban Forestry expects to double the rate of removal of trees for a period of about ten years while EAB infests and kills an estimated 30,000 street trees and 180,000 trees in city owned parks and ravines. Although exact numbers are not available, it is estimated that there are 420,000 ash trees on public and private lands in Toronto that will be killed by EAB, leading to a significant loss of tree canopy in Toronto. Contracted services may be in short supply as the public demand for tree removal increases.

In 2006, it was reported that Urban Forestry staff will be quickly overwhelmed by the additional volume of work should EAB spread through Toronto unless additional

resources are provided to deliver tree removal and planting services. It was estimated that the City of Toronto can expect to have costs of about \$37 million spread over five to ten years to pay for the removal and replacement of ash trees on street allowance plus additional costs for trees in parks and natural areas. This estimate was based on an average cost estimate for proper removal, disposal and replacement of street trees with calliper trees of \$1,405.00 per tree. This number did not include the cost of follow-up maintenance, which has since been estimated to be \$106 per tree operating cost. The total cost for a program to remove and dispose of 26,786 street trees, and to replace and maintain the same number of replacement trees is therefore estimated to be over \$40 million, with initial capital investment of about \$300,000, assuming the removal and replacements were to be spread over 10 years. Urban Forestry would require an additional \$4 million per year in operating budget for 10 years to fund this program. This value does not include the unknown number of ash trees in parks and ravines, and does not provide for increasing costs over time.

EAB Control Program

Eradication of EAB is not possible. The current strategy is to slow the spread through establishment of quarantine zones with the hope that either natural or pesticide controls might be established. For this strategy to be effective, timely removal of freshly infested trees must occur. Given the difficulty in identifying freshly infested trees, it is unlikely that this strategy will be effective for EAB.

CFIA is the lead agency responsible for controlling EAB spread in Canada. CFIA is obligated under International Plant Protection Convention (IPPC), (North American Free Trade Agreement (NAFTA), and North American Plant Protection Organization (NAPPO) to enforce regulations. CFIA staff may enter private property for the purpose of survey and/or control actions and declare things or places to be infested. CFIA may quarantine infested areas, places or things, to prevent movement of infested or suspect materials, including: ash nursery stock, non-manufactured ash forest products such as logs, slabs, rough-cut lumber, wood packaging materials, pallets, crates, bark and wood chips and firewood (*of any species*). An area or premise may be quarantined or regulated by declaring it to be infested via a Ministerial Order and/or through the issuance of a Legal Notice to the property owner.

CFIA will continue to conduct ground survey around high risk sites and may request assistance from other agencies, municipalities and members of the public. They may undertake limited tree removal to aid research purposes only.

The CFIA is proposing to notify property owners of new regulations in the area bounded by Yonge Street on the west, Steeles Avenue on the north, McCowan Road to the east and Eglinton Avenue to the south. Property owners who receive a Notice to Dispose from the Agency on or before March, 31, 2008 may be eligible for compensation under the *Introduced Forest Pest Compensation Regulations*.

If a pesticide is registered for use on EAB infested trees, single, high-value specimen trees may be protected through the use of a pesticide injection. No current registration

exists for this use in Canada. The use of pesticides to protect ash trees would be costly on a large scale although this would be much less than having to remove and replace dead trees.

Recently, Urban Forestry has been contacted by the Director Forest Surveys and Protection, BioForest Technologies Inc. with a request for support of a submission to Pest Management Regulatory Agency (PMRA) for emergency registration of TreeAzin for EAB in Ontario. Bioforest Technologies have been working with the Canadian Forestry Service for several years to develop this systemic insecticide and began studies on EAB in 2003. They now have some very good data showing efficacy against EAB even in high population situations. TreeAzin can only be injected with the EcoJect tree injection system which has been demonstrated to PMRA on several occasions and has had good reviews. The United States Department of Agriculture, Animal and Plant Health Inspection Service has evaluated the EcoJect System and given it a score of 10 out of 10 for worker safety. Information is being provided to Toronto Public Health staff for their review. Should they be supportive of the proposal to use TreeAzin to protect high value ash trees, Urban Forestry staff could prepare a letter of support for the application to PMRA seeking emergency registration.

Toronto Urban Forestry has reviewed records for planned and recent tree removal for the area around the known infested site to aid in the survey of potentially infested trees. Removal of City owned ash trees in the infested area commenced December 17, 2007.

The presence of EAB is difficult to detect through ground surveys given that the beetle typically first infests the canopy of the tree. It is important for Urban Forestry to aid in the mapping of the infested area through survey of upper canopy, as staff conduct routine tree removal and pruning work for ash trees throughout the city. It is likely that EAB has spread from the site where it was first detected in Toronto, given that the age of the infestation appears to be at least several years old. If it can be determined that the infested area has already spread throughout Toronto, Urban Forestry will work with Solid Waste to determine whether wood from private landscaping can be processed at transfer stations rather than obligating private owners to pay for the cost of double chipping wood to dispose of private trees. The options for wood processing available to Urban Forestry will also be greater if the regulated zone is larger than the area proposed for regulation by CFIA at the time of writing this report.

Toronto Urban Forestry has updated the City's website (www.toronto.ca/trees) with information about the current infestation and the importance of controlling movement of wood from the area. The public is directed to call the CFIA 1-866-463-6017 for directions on disposal.

EUROPEAN GYPSY MOTH

The gypsy moth is a native insect of Europe and North Africa, and it occurs across Asia to Japan. In North America, the European race is established in the north eastern United

States and the provinces of Quebec and Ontario, having expanded from the original introduction at Medford, Massachusetts in 1868.

European Gypsy moth was first found in Ontario in 1969. Its population cycles in relation to environmental and biological controls. Outbreak population levels were found in Toronto in 2006. Egg mass removal together with aerial and ground spray of a biological pesticide has been used to control pockets of infestation in 2006 and 2007.

European gypsy moth is recognized as a pest of quarantine significance; however the management of gypsy moth has taken two different forms depending on the history of the infestations. To protect areas of the continent where gypsy moth is not yet well established, CFIA issued a comprehensive policy to control the spread of North American gypsy moth, *Lymantria dispar* in Canada and the United States. This directive is for the use of the Canadian Food Inspection Agency (CFIA) staff, Canada Border Services Agency (CBSA) and any individual or company who wants to import into, move within or export from Canada of military and recreational and personal vehicles and equipment, nursery stock, Christmas trees, or other forest products with bark attached that are or could be infested with the gypsy moth. These products must comply with the phytosanitary requirements specified in this directive.

In areas of the continent where the gypsy moth is permanently established, management has concentrated on minimizing the impact on the forests and the public usually through large scale aerial spraying of Btk and long term alternatives like introducing biological controls. Such programs are generally implemented by landowners, such as the US Forest Service, the Ontario Ministry of Natural Resources, and the City of Toronto. Gypsy moth treatments are used to slow spread, minimize the degree of discomfort to people in the infested areas, and reduce damage to valuable host trees.

Bacillus thuringiensis subspecies kurstaki (Btk)

Bacillus thuringiensis subspecies *kurstaki* is a biological control agent which, when applied under proper conditions to the foliage of preferred host plants, results in the death of Lepidopteran, or butterfly and moth, larva feeding on the leaves. The active ingredients in Btk work only in the gut of moth and butterfly larvae and these conditions are not found in humans, mammals, birds or other animals. The timing of the application is critical as there is normally a period of approximately 14 days in the early development of the gypsy moth larva when Btk is most effective. Once Btk-treated leaf material is ingested, the normal operation of the gut of the caterpillar is disrupted resulting in a cessation of feeding causing death by starvation or lethal blood poisoning from the bacterium entering the host.

The commercial formulation that was used has the registered tradename of *Foray 48B* produced by Valent BioSciences Limited. *Foray 48B* is registered and approved for use by the Pest Management Regulatory Agency (PMRA) against gypsy moth in Canada applied aerially or from the ground for forestry, woodland and residential use. Btk is considered to be extremely safe and is not defined as a “pesticide” under *City of Toronto Municipal Code 612, Section 1, subsection (2) d*, the “pesticide by-law”.

Report on the 2007 European gypsy moth control program

The current year control program has been highly successful, as determined from ongoing monitoring and assessment of the areas that were treated in 2007. Treatment areas were located in Wards 2, 3, 4, 5, 11, 13, 22, 25, 26, and 27.

In the High Risk Areas of Blocks 1 and 2, where aerial spraying occurred, no defoliation was noted this summer after the spraying was completed and the presence of gypsy moth egg masses is very low. No further treatments are needed in these areas.

The ground spray and egg mass removal treatments applied in 2007 were successful. A ninety (90) percent success rate was achieved on one hundred and one (101) individual trees which were ground sprayed with *Btk*, with only limited defoliation of individual trees noted. The number of egg masses recorded after spray was low and few trees will require re-spraying. Over 3000 trees were treated using mechanical egg mass removal and spot spraying of egg masses with dormant oil. Little or no defoliation was noted in the areas treated in the above manner.

In 2008, it may be possible to recover some costs from private residents that receive a benefit of an aerial spray program. As of the writing of this report, the City of Toronto has recovered \$12,940.00 of cost of spraying in 2007 through voluntary payments from private land owners.

Recent surveys and control measures proposed for 2008

Throughout the spring and summer of 2007, Urban Forestry identified a number of new European gypsy moth “hotspots” within the City. The areas identified where the potential for moderate to severe defoliation are highest are located in Wards 4, 7, 8, 9, 13, 25, 26, 27 and 29.

In November, Urban Forestry initiated egg mass surveys of new areas of potential European gypsy moth outbreak. Egg mass surveys are not yet complete but it is clear that a number of new locations will require treatment in spring of 2008. See the table below for a summary.

Location	Ward	Approximate number of egg masses per tree	Expected threat	Proposed Treatment Option(s)
Moore Park	27, 26, 29	>100	Severe defoliation	Aerial spray of <i>Btk</i>
Sunnybrook Park/Edwards Gardens	25	29	Moderate defoliation	Aerial spray application of <i>Btk</i>
Bayview/Lawrence	25	32	Moderate defoliation	Survey incomplete. Ground-based or aerial spray application of <i>Btk</i> most feasible treatment options.

Hoggs Hollow	25	Few egg masses found. Population appears to be collapsing	Moderate defoliation of selected trees	Ground-based spray of <i>Btk</i> or egg mass removal treatment.
Rowntree Mills Park	7	High numbers of egg masses on 10 white oak trees	Moderate defoliation of selected trees	Ground or aerial spray of <i>Btk</i> depending on feasibility of access.
Don Valley Golf Course	25	> 100 (20 willow trees)	Severe defoliation	Ground or aerial spray of <i>Btk</i> depending on feasibility of access.
Jane/Sheppard (Northwood and Downsview Dells Parks)	8, 9	High numbers of egg masses – forest is not dominated by oak	Moderate to severe defoliation	Experimental treatment using naturally-occurring virus
Thorncrest	4	High numbers of egg masses on 10 white oak trees	Moderate defoliation of selected trees	Ground or aerial spray of <i>Btk</i> depending on feasibility of access.
Bloor-Royal York-The Kingsway	4	High numbers of egg masses on 20 oak trees	Severe defoliation of selected trees	Ground or aerial spray of <i>Btk</i> depending on feasibility of access.
Cranleigh Court	4	High numbers of egg masses on 30 trees	Severe defoliation of selected trees	Ground or aerial spray of <i>Btk</i> depending on feasibility of access.
Baby Point, Fifeshire and Lord Seaton areas	13, 25	High numbers of egg masses on few trees	Severe defoliation of selected trees	Small number of trees requiring egg mass removal

It is anticipated that Urban Forestry will participate with other levels of government in an experimental procedure to boost the background levels of a naturally-occurring virus, Nucleopolyhedrosis virus (NPV), which causes natural mortality of European gypsy moth larvae and helps in Gypsy Moth population collapse. The spot spraying of egg masses with a product containing this virus is proposed in a small controlled area. A Research Authorization from the Pest Management Regulatory Agency (PMRA) of Health Canada was granted in 2007 for this research and is anticipated for 2008. Urban Forestry has identified a site with moderate levels of European gypsy moth egg masses and no significant vulnerable oak population to conduct this treatment. Toronto Public Health has reviewed available environmental and health information on Gypchek®. Based on this review, TPH has determined that applying Gypcheck according to label instructions should result in negligible risk to the general public, product applicators, terrestrial and aquatic organisms

Urban Forestry intends to re-allocate approximately \$175,000 of its 2008 operating budget to implement a European gypsy moth control program and, as a result, there will be service implications equivalent to about 673 fewer tree pruning service orders being completed.

Zimmer Air and BioForest Technologies were the contractors used by Toronto and Mississauga to implement the aerial spray program in 2007. Urban Forestry has been unable to find any other contractors to perform this work, and therefore recommend that Council authorize staff to enter into sole source contracts with these companies for the 2008 gypsy moth aerial spray program.

A business case will be submitted in 2008 requesting \$250,000 operating funds for a dedicated forest health care program starting in 2009. This budget is required to fund

both a continuing gypsy moth management program, as well as programs to manage eastern tent caterpillar, Dutch elm disease, emerald ash borer, beaver damage control and other forest health care issues.

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