REPORT

Budget Committee

Meeting Date: December 14, 2021

FROM:	Parks and Open Space Department
DATE:	November 16, 2021
SUBJECT:	**2022 LDD Management Program**
WARD:	Town-wide

RECOMMENDATION:

1. The report *2022 LDD Management Program*, dated November 16, 2021 from the Parks and Open Space department, be received.

2. The recommended 2022 aerial spray program include forested areas having more than 3,750 LDD egg mass density, corresponding to severe and heavy defoliation.

3. That Option 2, as outlined within the staff report, be approved as the recommended 2022 *LDD Management Program*, at an estimated cost of $752,500, to be funded from the Capital Reserve.

4. That staff continue to liaise with Conservation Halton and Ontario Parks in an effort to include areas under their jurisdictions in aerial spraying programs or other mitigation measures in 2022.

KEY FACTS:

- This report is responding to the Council directive to provide a report on a recommended 2022 LDD Management to the 2022 Budget Committee.

- According to the 2016 iTree Report, LDD (Lymantria dispar dispar), if left untreated, has the potential to impact 409,000 trees within Oakville. This equals to 23% of the Town's tree canopy.

- According to the iTree assessment, the financial impact of untreated LDD on Town's Urban Forest is estimated to be $325 million.

- In the spring of 2021, Oakville's urban forests including trees in woodlands, parks and streets, were significantly impacted by LDD infestations.

- Municipalities and provincial authorities utilized different approaches from natural control (do nothing) to aerial spray, ground spray, tree injection and egg mass scraping to control the population of LDD.

- The most effective strategy for LDD management in woodlands is the aerial application of Bacillus thuringiensis var. kurstaki (BTK).

- In 2021 Forestry Services successfully completed a mitigation program that included an aerial spray for 102 hectares of woodlands, a ground spray of 162 high value oak street trees and distribution of 200 tree banding kits to private homeowners, residing within the highest infestation areas, to control the population of LDD.

- In 2021 Forestry Services received 476 service requests related to LDD. In 336 of those cases, the residents requested the Town to expand its LDD aerial spray program and to add more treatment options to protect oak stands and single oak trees.

- In August 2021 Council approved $165,000 to implement LDD egg mass scraping project in fall 2021 for approximately 2,300 trees It is anticipated that work will commence in early November and be completed prior to April 2022 to decrease the population of next generation of LDD.

- According to the latest defoliation and egg mass survey, site inspections from the treated and untreated oak stands in woodlands, plus single street oak trees; there are 430 hectares of forested areas forecasted as having severe and heavy defoliation and 437 street trees adjacent to severe hotspots for ground spraying. There are 41 hectares of forested areas forecasted to experience moderate defoliation.

BACKGROUND:

Oakville, similar to many municipalities, was significantly impacted by LDD infestations (Lymantria dispar dispar) in spring 2021. Municipalities and provincial authorities utilized different approaches from natural control (do nothing) to aerial spray, single tree treatment, tree injection and egg mass scraping to control the population of LDD (Lymantria dispar dispar). Due to the highest population of LDD recorded in the last 30 years in the province, and the significant number of residents' requests to do more to curb LDD infestation, natural control has not been supported by residents as an

acceptable approach to control LDD population in Oakville and other urbanized areas.

As a result in spring 2021 Forestry staff completed a mitigation program that included an aerial spray for 102 ha. of forested areas, a ground spray of 162 high value oak street trees and distribution of 220 tree banding kits to the private homeowners, residing within the highest infestation areas, to control the population of LDD in 2021. In addition, Forestry received 476 service requests related to LDD in 2021. In 336 of those cases, the residents requested the Town to expand its LDD aerial spray program and to add more treatment options to protect oak stands and single oak trees.

Due to the high number of concerns expressed by residents during spring 2021, Council requested a staff report on LDD which was discussed at the August 9, 2021 Council Meeting. At that meeting Council approved an egg mass scraping program for fall 2021 at an estimated cost of $165,000. Staff were also directed to prepare a 2022 LDD program report to the Budget Committee, which has given rise to this report.

Additional background information regarding LDD infestations, insect profiles, and historical management approach and mitigation efforts in 2021 was provided in the Gypsy Moth Mitigation Plan Council report on August 09, 2021. (See Appendix A)

COMMENT/OPTIONS:

The Forestry section applies three sets of information to outline its management options and action plans to control LDD population, including:

- Proactive monitoring: Forestry's consultant performs an extensive LDD survey every year to identify areas having high egg mass density and high defoliation rates due to LDD. Traditionally Forestry receives LDD survey reports in December of every year. In order to provide the 2022 Budget Committee the most current data, Forestry staff and its consultant worked intensively to complete the LDD survey data collection earlier than normal. The information in this report reflects the latest data completed in 2021.

- Reactive monitoring: Forestry performs a post treatment audit to assess the efficacy of treatment and the impact of Nuclear Polyhedrosis Virus (NPV) on LDD population.

- Service request inspection: Forestry staff inspect all LDD related service requests received by Service Oakville to identify the best method of management control and scope of treatment.

Methodology, Action Plans and Options:

Methodology:

In total, 289 woodland/park plots were completed as part of the LDD survey in 2021 to determine necessary actions for 2022. An increase in resident reports/ requests and observations by Forestry staff prompted an expansion of the roadway plot network from 2020. In total, 124 right of way plots were completed as part of the LDD survey in 2021

Two (2) indicators of egg mass size and old/new egg mass ratio have been used to calculate egg mass density. Egg mass density has been used to classify defoliation forecast into five classes below:

Egg Mass Density (EM/ha)	Defoliation Forecast	Defoliation Forecast Range (%)
0	Nil	0 to 5
0 to 1,250	Light	6 to 25
1,251 to 3,750	Moderate	26 to 65
3,751 to 5,000	Heavy	66 to 90
>5,001	Severe	91 to 100

In all previous aerial spraying programs implemented in 2008, 2018, and 2021, the town program targeted areas having more than 5,001 egg mass density (egg mass per hectare) and forecasted severe defoliation.

The data on 289 woodlands and parks plots indicates approximately 422 hectares of forested areas is forecasted to have severe defoliation while 8 hectares and 41 hectares are forecasted to have high and moderate defoliation. (See Appendices B, C and D. for the maps of severe, high and moderate defoliation forecasts).

The data on 122 roadway plots identified 10 plots having severe and heavy forecasted defoliation. Staff augmented the roadway plots with site inspections in response to resident's service requests and identified additional trees adjacent to hotspots for ground spraying. A total of 437 trees have been selected for ground spraying in 2022. (See appendix E. for mapping of roadway plots and single tree treatment)

Action Plans:

As noted previously, Forestry will continue LDD egg mass scraping which is expected to be completed by April 01 2022, as a mitigation measure to reduce the population of LDD in 2022. Other components of the 2022 LDD program include;

1. Aerial Spraying
2. Ground Spraying
3. Supplying Tree Banding Kits

1. Aerial spray

Aerial spraying with Btk, within the proper window of time, is the most effective and least harmful method of controlling LDD. Oak stands, having over 5,000 egg mass density and severe defoliation rate, were treated in 2021.

Forestry staff have engaged local area municipalities to discuss their LDD aerial programs for 2022. While programs are still evolving, it is apparent many nearby municipalities are expecting to conduct aerial programs in 2022 due to the severity of the problem in spring 2021 and not conducting an aerial spray program at that time.

Staff reached out to Conservation Halton and discussed their LDD management program for 2022. According to Conversation Halton their egg mass survey has not been completed hence the potential scope of work for 2022 LDD action plan has not been determined at the time of writing this report.

2. Ground Spraying

Ground spraying of Btk is an effective treatment option to inhibit feeding and reduce populations for single street trees. It is a labour intensive approach and not recommended and/or implemented for trees in forested areas due to the limited accessibility of target trees. The other challenge is the narrow application time (2-3 week window) after the hatch out of LDD moth and the emergence of target leaf species to allow for bio-insecticide deposition on the leaves.

Forestry is continuing to monitor the development of LDD in 2022, identify new areas of defoliation from resident reports, and monitoring for signs of NPV population controls.

Staff have identified 437 trees adjacent to severe hotspots for ground spraying in 2022. The estimate cost of the application of Btk to the street trees is $87,400. It is recommended to proceed with ground spraying these 437 trees in 2022.

3. Tree Banding

Tree banding is an effective way to locally reduce the number of LDD caterpillars. They are applied approximately 5 feet up on the main stem, and trap caterpillars during their daily migration from the ground to the canopy. Tree banding is a viable option for a select number of high value trees.

Resident responses to the provision of the banding kits were very positive in both 2018 and 2021. Tree banding kits were in short supply in 2021, so knowing the forecasted potential defoliation in 2022, Forestry has already ordered 500 tree banding kits in advance of 2022. These will be distributed to homeowners residing in the severe and high defoliation forecast areas.

Forestry staff will explore the possibility with the manufacturer for another 500 tree banding kits order to purchase for a selected number of high value municipal trees as well to provide greater numbers to residents residing in the severe infestation areas, in 2022, in advance of the hatch out season. The manufacturer continues to communicate shortages of banding material for the kits, and anticipates significant demand into the 2022 season.

Options:

There are three (3) options for aerial spray program that defines the scope of work and associated cost, including:

1. Aerial spray 422 hectares of forested areas having over 5,000 egg mass density and severe defoliation forecast and ground spray on 437 single trees with the total cost of $741,900.

2. Aerial spray 430 hectares of forested areas having over 3,750 egg mass density and severe and heavy defoliation forecast and ground spray on 437 single trees with the total estimated cost of $752,500. (**Recommended Option)**

3. Aerial spray 471 hectares of forested areas having over 1,250 egg mass density and severe, heavy and moderate defoliation forecast and ground spray 437 single trees with the total estimated cost of $814,700.

Based on data collection, survey results and site inspections it has been confirmed that high defoliation in 2022 is forecasted in the areas having over 3,750 egg mass density. Forestry staff recommend to Council a comprehensive LDD program to implement an aerial spray on 430 hectares of forested areas (forecasted to have severe and heavy defoliation) and ground spray 437 single municipal street trees.

CONSIDERATIONS:

(A) PUBLIC

The public is aware of the importance of our urban forests and the impact of LDD moth and other invasive pests on the Town's forest health. Staff will continue communicating with public through public meetings/open houses, notices delivered to homes, advertisements in local newspapers and other print brochures, electronic communications, to educate the public and inform them on the planned LDD management program including egg mass removal, aerial spraying, ground spraying and tree banding programs in 2022.

(B) FINANCIAL

The total cost of Option 2 (Recommended 2022 LDD Management Program), including aerial spray on 430 hectares of forested areas, ground spraying on 437 street trees adjacent to severe hotspots and supplying 500 tree banding kits for a selected number of high value municipal trees is estimated at $752,500. These costs would be funded from the Capital Reserve.

This cost may be impacted by the actions of adjacent municipalities for 2022. Initial discussions are already occurring with neighbouring municipalities, Conservation Halton, and Bronte Creek Provincial Park to determine their plans for 2022.

(C) IMPACT ON OTHER DEPARTMENTS & USERS

The 2022 LDD Management Program, especially aerial spraying component, requires support from several internal and external departments, as well as agencies to effectively communicate and implement this program. Departments including Strategy Policy and Communications, Finance, Roads and Works, Oakville Transit, and external agencies such as Halton Regional Police, Health Canada, Pest Management Regulatory Agency, and Ministry of Transportation are involved in the planning and implementation of the aerial spraying program.

Forestry has successfully implemented aerial spraying in 2008, 2018 and 2021; hence, all internal departments and external agencies are aware and supportive of the business process.

(D) CORPORATE STRATEGIC GOALS

This report addresses the Corporate Strategic Goals to enhance our natural environment, to be accountable, to continually improve our program and services, and to have programs that are environmentally sustainable.

(E) CLIMATE CHANGE/ACTION

The urban forest is under ongoing pressure from climate change, invasive species, pests and disease.

Global spread of harmful forest pest species including LDD is a possible consequence of climate change. A model of the LDD seasonality was used to predict the probability of its establishment in Canada (Régnière et al. 2009). The model predicted that this species, which has many host plants will threaten considerable hardwood forest resources as climate change allows it to expand further north and west into Canada.

It is estimated that the proportion of Canada's deciduous forests at risk of damage by LDD moth will grow from the current 15 percent to more than 75 percent by 2050.

The recommendation and action plans presented in this report are targeted to control the increasing LDD population trend in Oakville and ideally keep them under its endemic population level.

APPENDICES:

Appendix A – Gypsy Moth Mitigation Plan – Council Report August 09, 2021
Appendix B – LDD Severe Defilation Map – Option 1
Appendix C – LDD Severe and Heavy Defoliation Map – Option 2
Appendix D – LDD Severe, Heavy and Moderate Defoliation Map – Option 3
Appendix E – LDD Roadway Plots Defoliation and Ground Spray Map

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