

Grand River Conservation Authority

Report number: GM-12-21-96

Date: December 17, 2021

To: Members of the Grand River Conservation Authority

Subject: LDD Moth Update

Recommendation:

That Report Number GM-12-21-96 – LDD Moth Update be received as information.

Summary:

Ontario has been experiencing a significant LDD moth outbreak since 2020. Notable levels of defoliation first occurred on some Grand River Conservation Authority (GRCA) properties in the south half of the watershed in 2018. LDD moth populations are highly cyclical and are expected to decline over the next couple of years. Defoliation from LDD moth populations over multiple years can cause tree mortality, resulting in negative ecological impacts and increased hazard tree removal costs. Large numbers of caterpillars negatively impact GRCA conservation area visitor experience.

The GRCA implemented aerial treatments to limit impacts of LDD moth on susceptible portions of forest at 5 of its properties in 2020 and 2 of its properties in 2021. Through discussions between the Watershed Forester and Conservation Area staff it was decided that additional aerial treatments on GRCA lands would not be pursued in 2022. It is believed that the risk to forest health on GRCA lands are relatively low. It is anticipated that some pockets of caterpillar activity and defoliation may still occur on GRCA lands in 2022 but that forest health impacts will be minimal.

Report:

Previously known as Gypsy Moth, many organizations including the GRCA have transitioned to temporarily using LDD moth as an acronym for the species' Latin name (*Lymantria dispar dispar*) to identify this insect while awaiting a new common name.

LDD moth is a highly cyclical non-native forest pest. High populations of LDD moth result in the defoliation of a wide variety of deciduous and coniferous trees with significant potential impacts on tree and forest health. Oaks species are especially preferred. Tree mortality occurs primarily in trees already in decline or exposed to other stress, and increases with multiple years of defoliation. Regional outbreaks typically last two to four years after which populations crash due to natural factors.

Primary risks that LDD moth presents for the GRCA:

- Ecological impacts from declines/losses of oaks and other trees
- Negative conservation area visitor experiences due to large numbers of caterpillars/moths and tree declines and mortality
- Increased hazard tree and limb removal costs

Increasing populations of LDD moth have been experienced in many parts of southern Ontario over the past several years. Portions of the southern half of the Grand River watershed have been impacted since 2018. A notable increase across south and central Ontario occurred in 2020. That year, the NDMNRF mapped around 600,000 hectares of moderate and severe

defoliation. Close to 1.8 million hectares of defoliation were mapped in 2021 (see map in appendix). This is over four times higher than defoliation levels mapped in previous LDD moth outbreaks in Ontario.

The GRCA implemented an aerial spray program in the spring of 2020 using the biological pest control agent Btk (*Bacillus thuringiensis* 'kurstaki'). Highly susceptible portions of forest at Pinehurst, Brant and Byng Conservation Areas and at the Dryden Tract and FWR Dickson Wilderness Area were treated in 2020 (162 ha total) and additional treatments occurred at Pinehurst and Brant in 2021 (70 ha total).

The pattern of previous LDD moth outbreaks in Ontario has led many with experience in the field to predict that a decline in populations due to natural factors is highly likely within the next year or two. The likelihood of this is especially high in the southern portions of the watershed where populations have been highest the longest. It is unknown exactly when declines will occur and/or whether local pockets of significant defoliation may persist.

NDMNR staff are currently completing LDD moth egg mass counts at locations across Ontario. 2022 defoliation forecast maps based on this work are expected to be available in early winter. This mapping will be helpful in providing an overview of the direction the provincial outbreak is headed. To accurately determine the level of risk LDD moth presents for a specific forest or region, local egg mass counts or ongoing monitoring are required.

Egg mass counts on a number of GRCA properties in the south half of the watershed were completed prior to the 2019, 2020 and 2021 seasons. These counts were used to inform the treatment decisions made in 2020 and 2021. Levels of summer defoliation have been monitored in treated and untreated areas. General monitoring of egg mass levels occurred in early November of this year (see GRCA property observations in appendix).

From ongoing observations and discussions between the Watershed Forester and conservation area staff, the decision was made that fall-winter egg mass counts and 2022 aerial treatments on GRCA lands are not required based on several factors:

- in areas treated in 2020 and/or 2021, susceptible trees have had a break from significant defoliation over the past two seasons and should be able to withstand a moderate level of defoliation if it occurs in 2022
- 2022 defoliation on the GRCA lands monitored is generally expected to be lite (to moderate but patchy in some areas), based on general egg mass observations
- an increasing probability that regional LDD moth populations will soon decline (especially in the southern half of the watershed)
- defoliation on GRCA lands in the northern half of the watershed to date has been patchy and forests on those properties could withstand moderate to severe levels of defoliation if it occurs in 2022 without significant impacts on overall forest health

It is important to note that these observations and management decisions are specific to GRCA-owned lands. Moderate to severe defoliation occurred in many untreated forests and trees across the watershed in 2020 and 2021, including some areas in the north half of the watershed. Forecasts of potential impacts of LDD moth in 2022 by other watershed forest landowners should be based on forest specific observations and/or egg mass counts.

There are many provincial and local sources of information for landowners concerned about LDD. Two websites include the [Ontario Invading Species Awareness Program](#) and [Forest Invasives Canada](#). Information about GRCA's response can be found [on our website](#).

Financial Implications:

A total of \$26,000 was spent on LDD moth control on GRCA lands in 2021. The majority was for direct costs of aerial insecticide application on 70 ha of forest. In 2020 \$46,000 was spent on

LDD control. Again the majority related to aerial applications (162 ha). \$9500 of the 2021 total was used for hiring a contractor to monitor caterpillar emergence and for egg mass counts to forecast 2021 defoliation. Expenditures have been funded through the Conservation Area and Conservation Lands budgets. 2022 expenditures will be minimal and consist potentially of some individual tree injections, manual methods of control on individual trees, and potentially fall egg mass counts if warranted.

Other Department Considerations:

The following program areas continue to be involved in the planning, decision making and implementation of LDD moth management: natural heritage, conservation areas, communications, operations and Burford nursery staff.

Prepared by:

Ron Wu-Winter
Watershed Forester

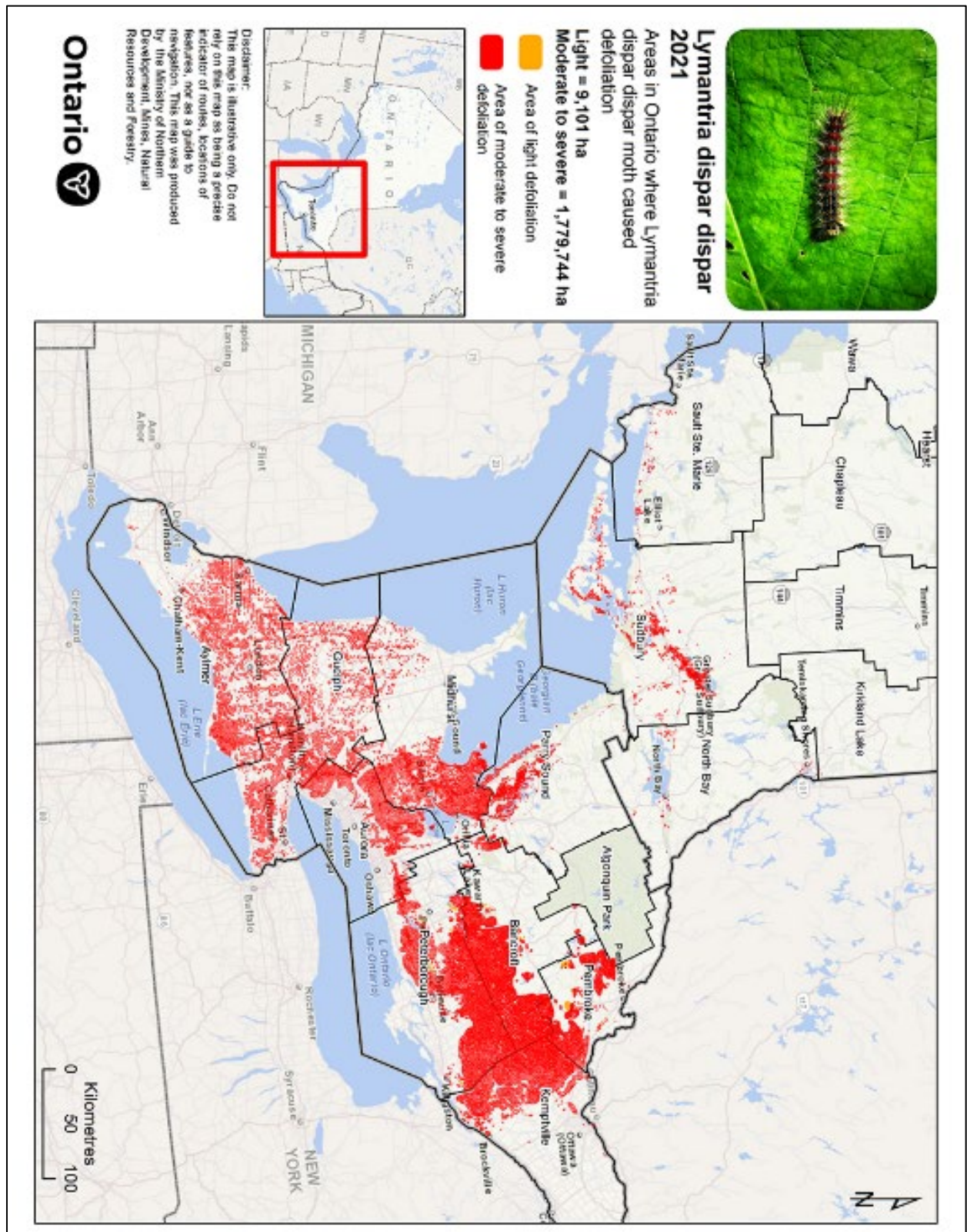
Approved by:

Nancy Davy
Director of Resource Management

Crystal Allan
Supervisor, Natural Heritage

Appendix

Figure 1 Map of 2021 LDD Defoliation in Ontario



LDD 2021 - Overview of Informal Monitoring on GRCA Lands

Byng Island – aerial treatment in 2020 (48.5 ha)

June\July 2021 Defoliation Monitoring

- Defoliation was very low throughout most of the Conservation Area (CA); one small cluster of oak trees near ball diamond has significant defoliation.
- Outside of CA, there is moderate to significant defoliation in adjacent trees on northwest edges of CA and throughout many other areas in Haldimand

Comments \ Recommendation

- Formal egg mass counts and 2022 aerial treatment not required; conservation area could consider individual tree protection measures

Brant – aerial treatments in 2020 (20.5 ha) and 2021 (38.2 ha)

June\July 2021 Defoliation Monitoring

- Treated areas in very good condition - oaks in same or better condition than at time of first application - 10% defoliation max; very few caterpillars on leaves
- Outside of treatment areas but within CA, most oaks 50-90% defoliation; poplars near entrance and gatehouse 90% plus. Oaks along entry road 60-90%
- Outside of conservation area – widespread significant defoliation in untreated trees\forests

November 2021 Egg Mass Observations

- Most trees in treated areas have low numbers of egg masses, but a few are moderate
- Untreated areas including oaks along entrance way road up to pool - moderate to high egg mass levels;

Comments \ Recommendation

- Could consider formal egg mass counts to inform 2022 aerial treatment decision, however suspect low to moderate defoliation in treated portions and that trees are able to take any stress given previous year(s) of relief; areas at most risk (untreated portions of forest near gatehouse and entry road) are of lower overall susceptibility and use; conservation area could consider individual tree protection measures

Nelson Aggregates (south of Paris) – untreated, visited as general benchmark

November 2021 Egg Mass Observations

- Most oaks have high (to moderate) egg mass numbers. Many of the new egg masses are very small (< 2 cm)

Pinehurst – aerial treatments in 2020 (49 ha) and 2021 (32 ha)

June\July 2021 Defoliation Monitoring

- Defoliation of trees in treatment area very low < 10% and similar to levels at time of first application. Very few caterpillars present on small oaks near beach (found 2)
- In untreated seasonal campground, defoliation and caterpillar levels low on red and white oak even though bigger white oak have fair # of old egg masses
- defoliation of oaks just outside of CA (to north) is moderate to severe; many trees\forests in surrounding areas have significant defoliation

November 2021 Egg Mass Observations

- Generally new eggs mass levels low (and much lower than old masses). A few trees around with moderate levels. Suspect that given low # of egg masses in untreated areas at Dickson that populations are in decline in surrounding area

Comments \ Recommendation

- Formal egg mass counts and 2022 aerial treatment not required; conservation area could consider individual tree protection measures

Dryden & FWR Dickson – aerial treatments in 2020 (Dryden 34 ha, Dickson 10 ha)

June\July 2021 Defoliation Monitoring

- Dryden - Defoliation is light across most of property- odd oak has moderate
- defoliation levels in surrounding forests are high (to moderate)

November 2021 Egg Mass Observations

- Dickson - Egg masses low to moderate throughout; a lot more old egg masses than new. Higher but moderate levels on a few of the poplars and oaks at back of the forest near the lake
- In untreated portions of the property, egg masses also low to moderate

Comments \ Recommendation

- Formal egg mass counts and 2022 aerial treatment not required

Shades Mill – no previous treatments

June\July 2021 Defoliation Monitoring

- Some pockets of moderate to significant defoliation- especially poplar and birch but not wide enough spread or enough susceptible trees to justify aerial spraying

November 2021 Egg Mass Observations

- During a short site walk it was noted low egg mass levels on most species; a couple of oaks have moderate levels

Comments \ Recommendation

- Formal egg mass counts and 2022 aerial treatment not required; conservation area could consider individual tree protection measures

Rockwood – no previous treatments

June\July 2021 Defoliation Monitoring

- Overall defoliation is low to moderate although there are small pockets of trees with heavy defoliation; primarily on birch, poplar and red oak; overall concentration of susceptible species in CA is moderate (not as high as southern CAs)

Comments \ Recommendation

- Formal egg mass counts and 2022 aerial treatment not required; conservation area could consider individual tree protection measures