Tree Inventory

GIS'd Tree Inventory pie chart showing:
- Syringa sp., 0.27%
- Acer sp., 1.82%
- Fraxinus sp (ash), 35.26%
- Ulmus sp. (elm), 43.30%
- Larix sp, 0.14%
- Other Coniferous, 0.40%
- Other deciduous, 4.81%
- Tilia sp., 2.55%
- Picea sp., 6.02%
- Salix sp., 0.21%
- Prunus sp., 2.68%
- Populus sp,
- Pinus sp., 0.49%
- Quercus sp., 0.22%
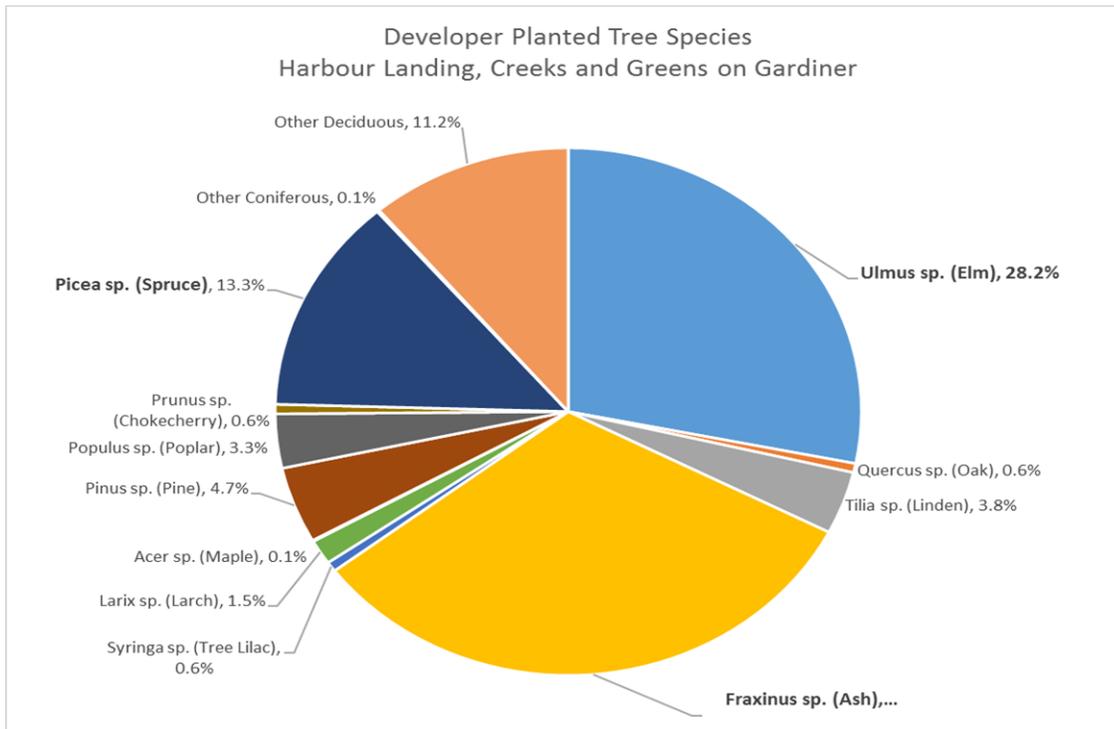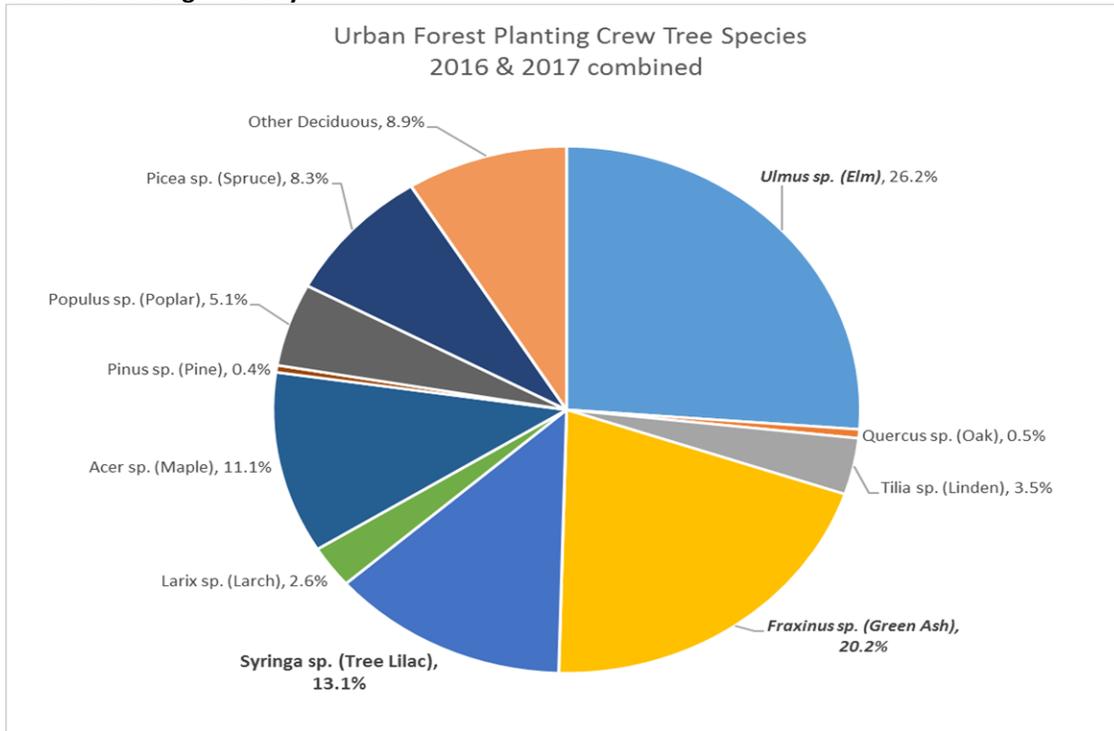
*This is the total number of trees in the GIS Tree Inventory as of January 1, 2018. Inventory primarily shows residential street trees. Total trees in GIS Inventory = 76,492

** Current Regina Urban Forest Strategy (2001)- sustainability goal is no more than 25% of any one genus within City (specific area). Prior to 1989 majority of plantings were predominately elm or ash.

Current Planting Diversity

Urban Forest Planting Crew Tree Species
2016 & 2017 combined

- Other Deciduous, 8.9%
- Picea sp. (Spruce), 8.3%
- Populus sp. (Poplar), 5.1%
- Pinus sp. (Pine), 0.4%
- Acer sp. (Maple), 11.1%
- Larix sp. (Larch), 2.6%
- *Syringa sp. (Tree Lilac),* **13.1%**
- *Ulmus sp. (Elm),* 26.2%
- Quercus sp. (Oak), 0.5%
- Tilia sp. (Linden), 3.5%
- *Fraxinus sp. (Green Ash),* **20.2%**

Developer Planted Tree Species
Harbour Landing, Creeks and Greens on Gardiner

- Other Deciduous, 11.2%
- Other Coniferous, 0.1%
- **Picea sp. (Spruce)**, 13.3%
- Prunus sp. (Chokecherry), 0.6%
- Populus sp. (Poplar), 3.3%
- Pinus sp. (Pine), 4.7%
- Acer sp. (Maple), 0.1%
- Larix sp. (Larch), 1.5%
- Syringa sp. (Tree Lilac), 0.6%
- **Ulmus sp. (Elm),** 28.2%
- Quercus sp. (Oak), 0.6%
- Tilia sp. (Linden), 3.8%
- **Fraxinus sp. (Ash),...**

Current Planting Diversity of replacement trees (Internal) and new areas coming online. *Fraxinus sp. and Ulmus sp* remain a tree of choice. Current Regina Urban Forest Strategy (2001)- sustainability goal is no more than 25% of any one genus within City (specific area).

Stocking Rate of Street Tree Inventory
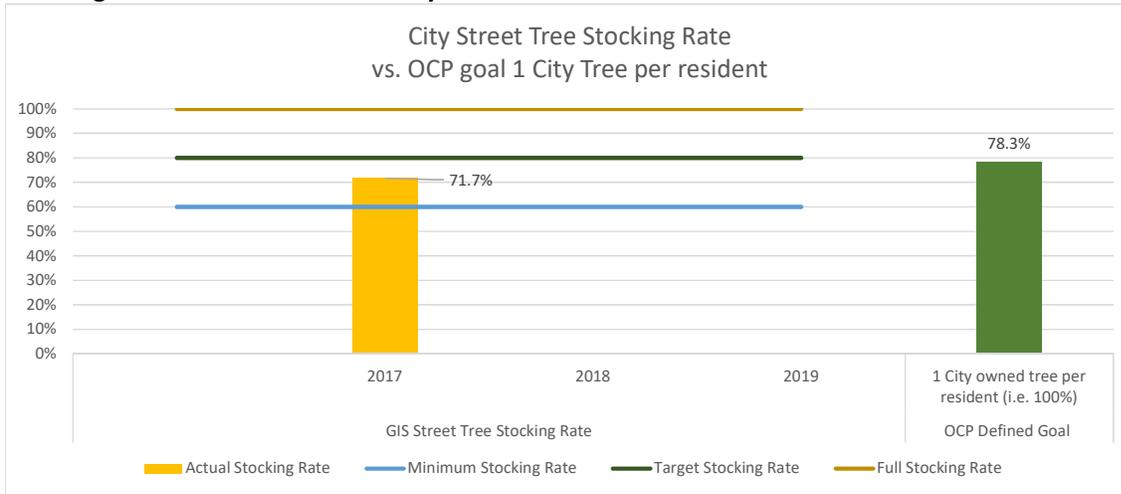
Street Scape Stocking Rate - is defined as the number of trees in planted vs the total number of possible planting spaces (*Journal of Arboriculture, Richards, 1992*). Regina's city tree street planting stocking rate is at 71.7% capacity. Park and Buffer trees are not identified as part of stocking rate as potential planting spaces are not clearly defined.

* Assuming th 2001 MCSII inventory is correct (162,000 trees) plus (2002- 2011 net tree change = +4,407) plus the net tree change from 2012 to present as shown on net tree change (chart 6 this report)--- This means the current inventory stands at approximately 176,188 trees. The inventory process will either verify or nullify this assumption. It will take a minimum two more years to complete inventory process.

** Regina's 2017 population estimate is 225,000 people. Regina Official Community Plan sets a target of 1 city owned tree per resident. (Goal for 225,000 trees)

 ***Approximately 45% of the total tree inventory is recorded by GIS currently as compared to MCSII dataset --162,000 (2001 Inventory). More will be added into inventory over 2018 as part of a data management system conversion and site verification.
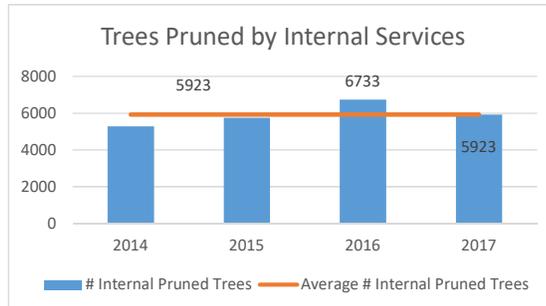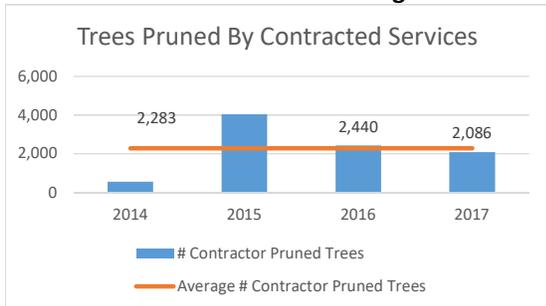
Forestry Maintenance Section
Forestry Tree Pruning
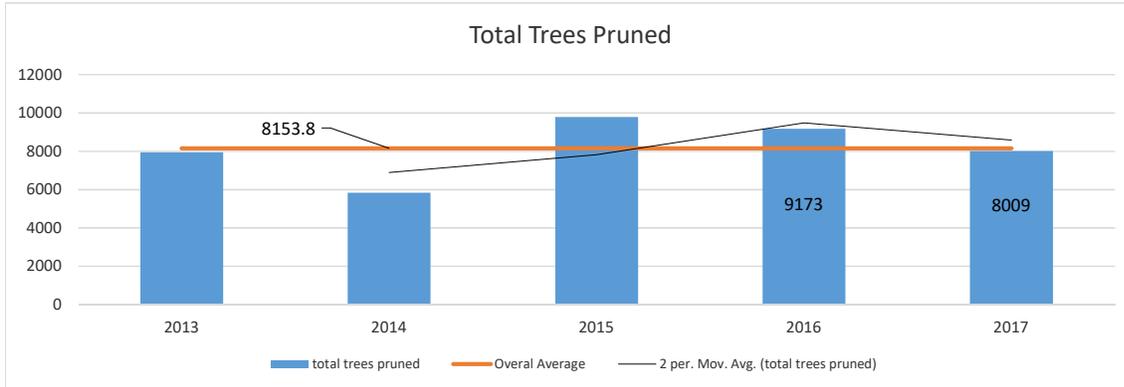
Includes - Internal Scheduled Pruning, Service Requested Pruning, Broken Branch Pruning, PW Pruning and Contracted Pruning.

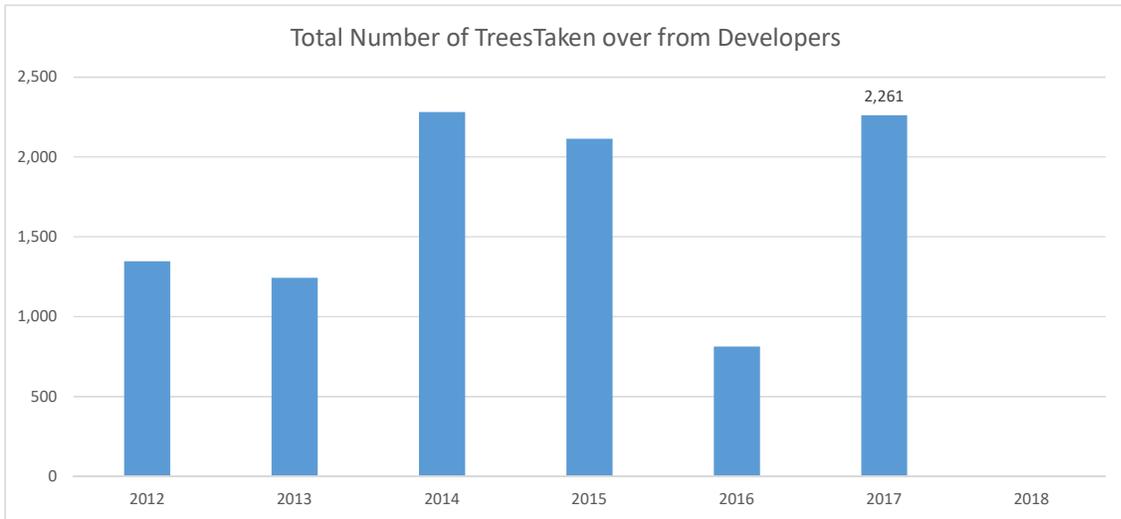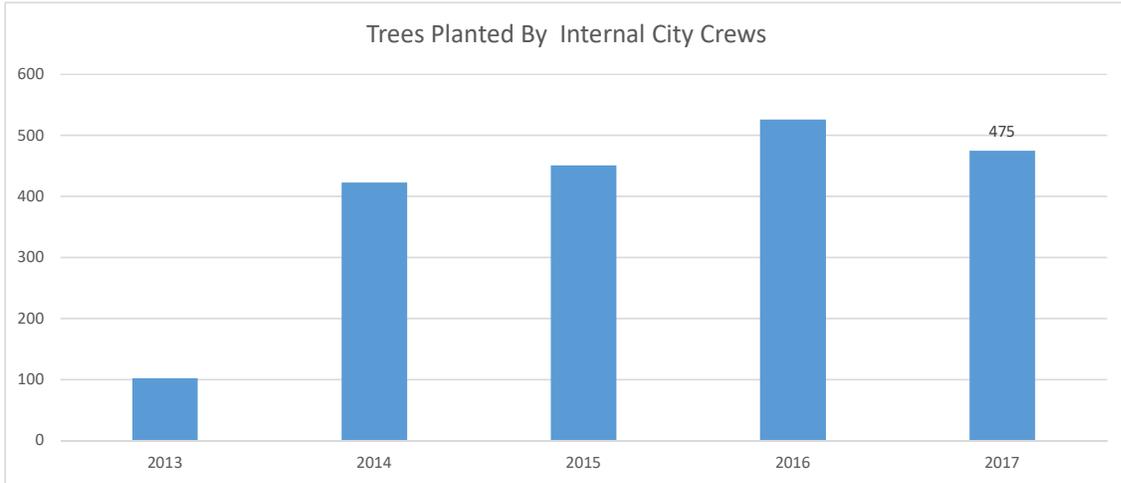* 2017 - Due to provincial funding shortfall - Forestry saw a $50,000 reduction in contracted pruning services.

Contracted Versus Internal Pruning

* 2014 - No Winter Elm Contract issued due to unusually high tender price.

** 2015 saw extra one time funding for contracted services.

*** 2017 Budget 2.0 reduced funding by $50,000 to contracted pruning.

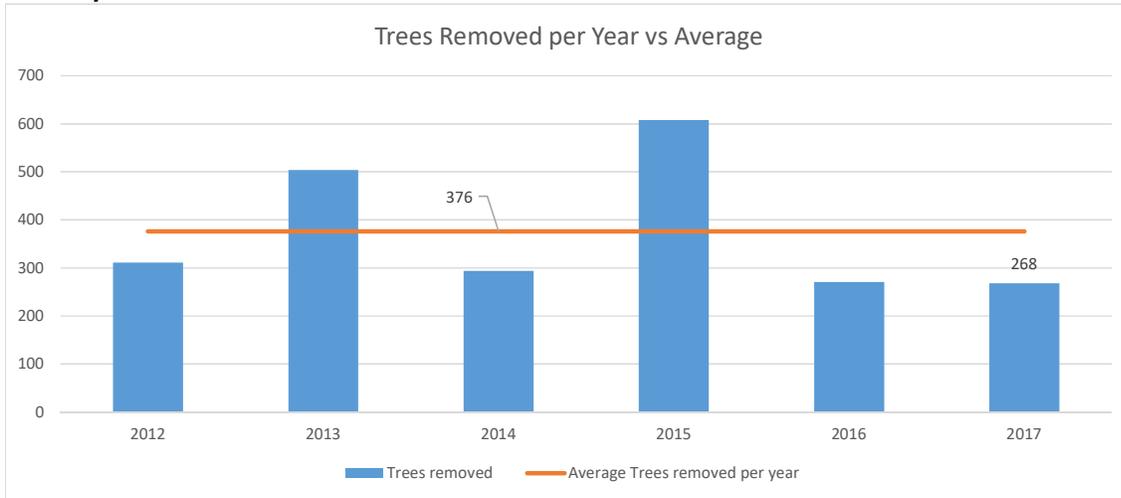**Forestry New Trees**

Trees Planted By Internal City Crews

Total Number of Trees Taken over from Developers

Forestry - Trees Removed

Trees Removed per Year vs Average

* 2015 was higher than normal due to a PW flood prevention project at Gordon Rd & Lewvan Dr. Trees were replaced at the site

Forestry - Net Tree Change


Net Tree Change
(new trees less trees removed)
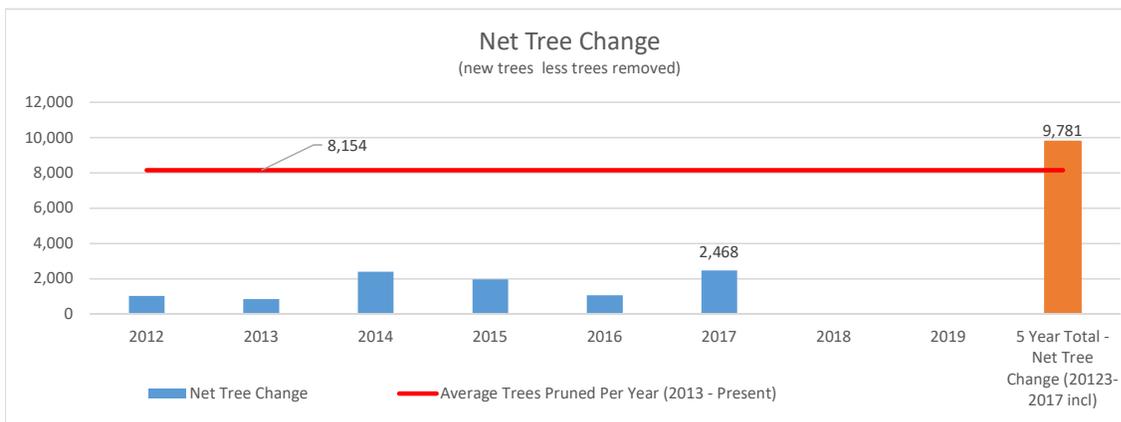
*This is calculated from the total new trees (City and Developer combined) minus total trees removed. Total Tree change (**9,781 Orange**) show the significance to inventory change over past 5 years.

** The average number of trees pruned is 8,154 trees/year (Red). This may mean that since 2012, more trees have been added to the inventory to increase the pruning cycle more that 1 year at maturity.
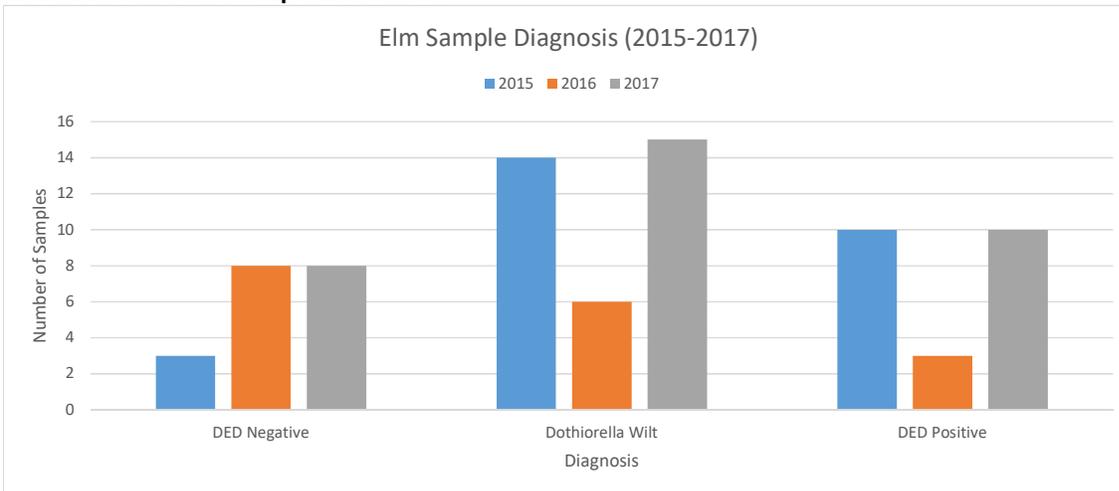
Pest Control Section
DED Incidences - since 1981
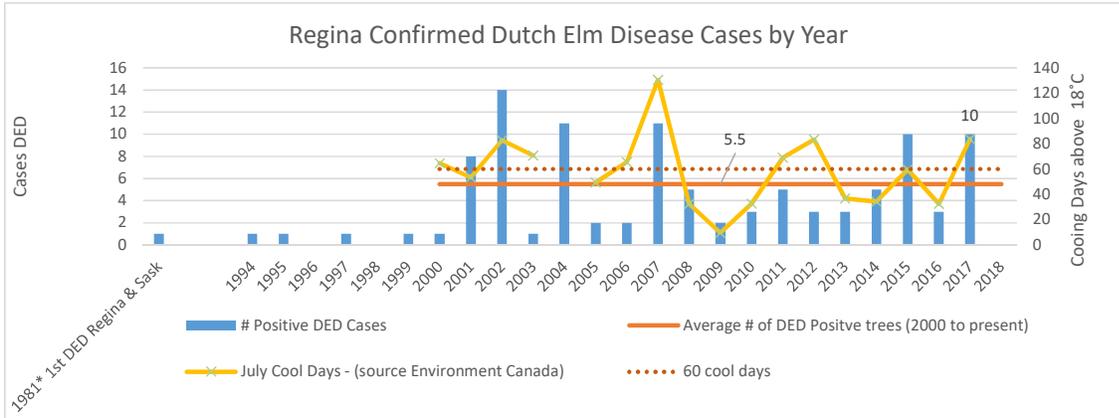
* Total number of trees lost to Dutch Elm Disease from 1981 to 2016 inclusive (36 years) is 104.

** There seem to be a correlation with years of higher incidences of DED - with hot summers exceeding 60 Cooling degree days above 18°C

2017 Diseased Tree Sample Lab Results

33 Samples were submitted to the Provincial Crop protection Lab during 2017. Compare to 2016 where 17 samples were submitted.

* 10 trees confirmed DED Positive - trees that test positive for Dutch Elm Disease (*Ophiostoma novii-ulmi*)
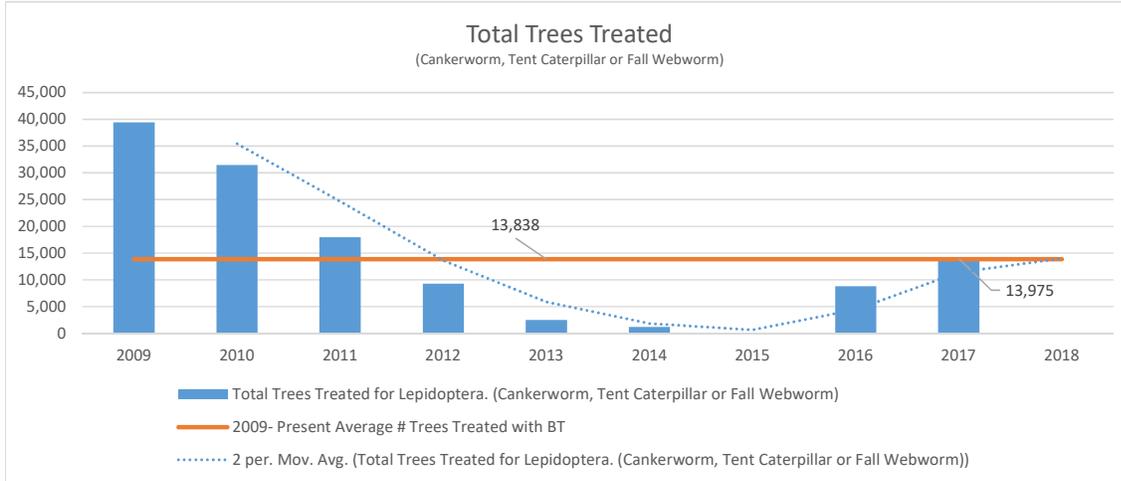
** 15 trees confirmed with Dothiorella Wilt. This is fungal disease affecting elms - not as pathogenic as DED as is managed through a fungal treatment with followup pruning program.

*** 8 trees were reported as DED Negative - the sample could not be successfully cultured in a laboratory setting.

Positive DED Trees (2013-2017)
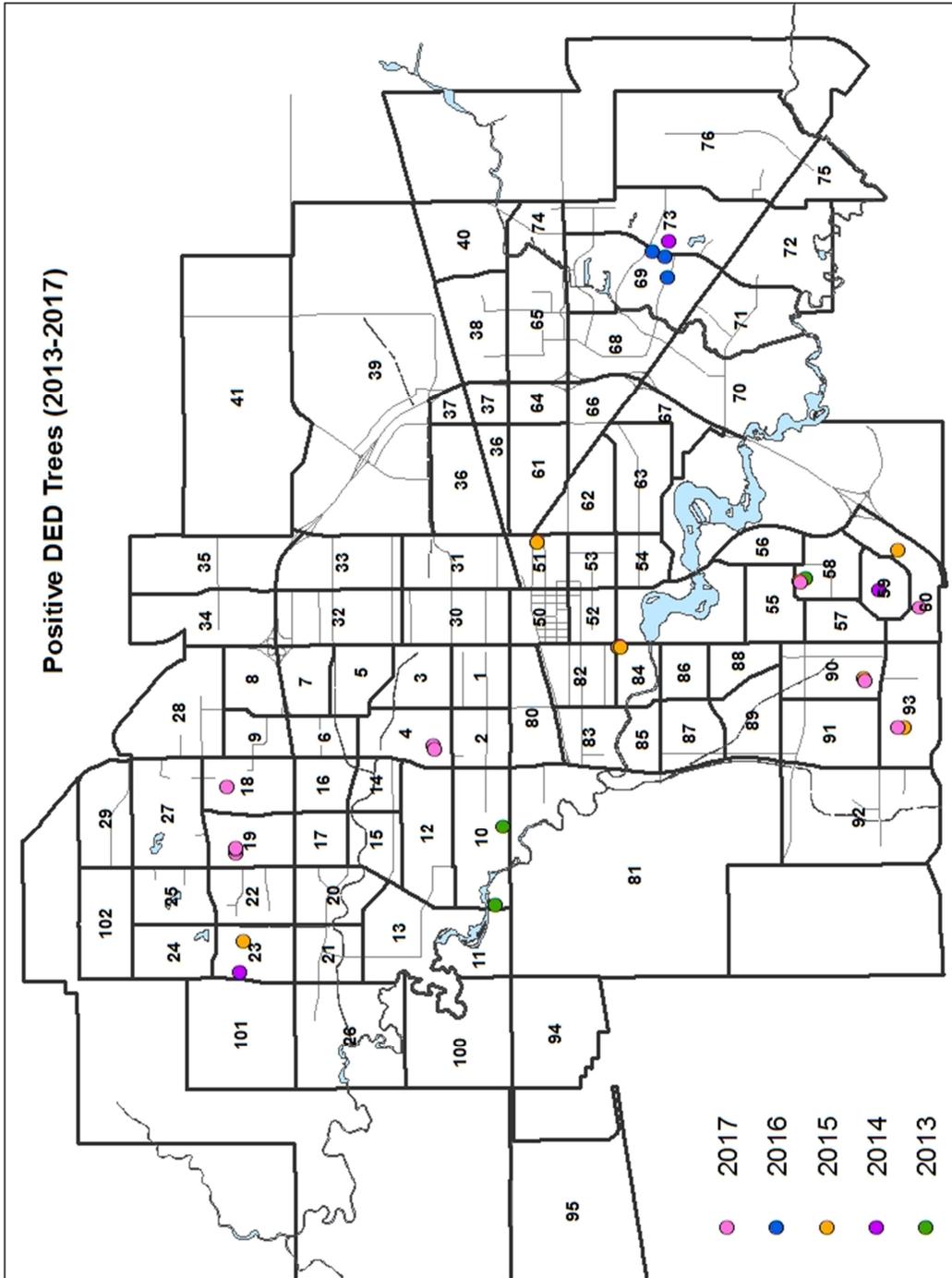
Trees Treated for Cankerworms/Tent Caterpillars or Fall Web Worm

Total Trees Treated
(Cankerworm, Tent Caterpillar or Fall Webworm)

Legend:
- Total Trees Treated for Lepidoptera. (Cankerworm, Tent Caterpillar or Fall Webworm)
- 2009- Present Average # Trees Treated with BT
- 2 per. Mov. Avg. (Total Trees Treated for Lepidoptera. (Cankerworm, Tent Caterpillar or Fall Webworm))

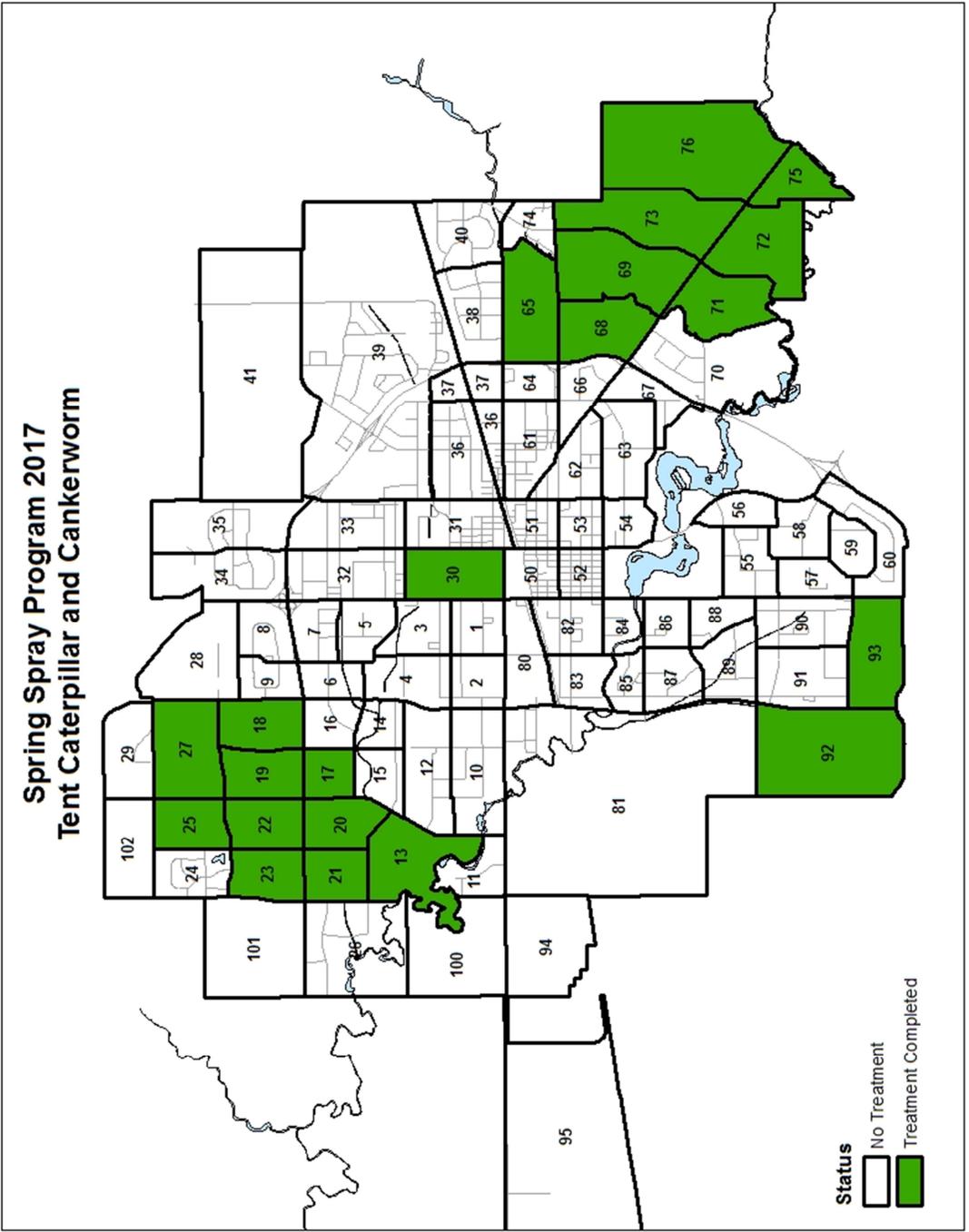* Treatment of these trees was with a Bacillus thuringiensis var. kurstaki (BT) based spray.

** Historically treatments are based on established threshold for Cankerworms - which means below average treaments will be due to low population numbers.
*** Trendline show that by treatments required per year are reversing in trend.

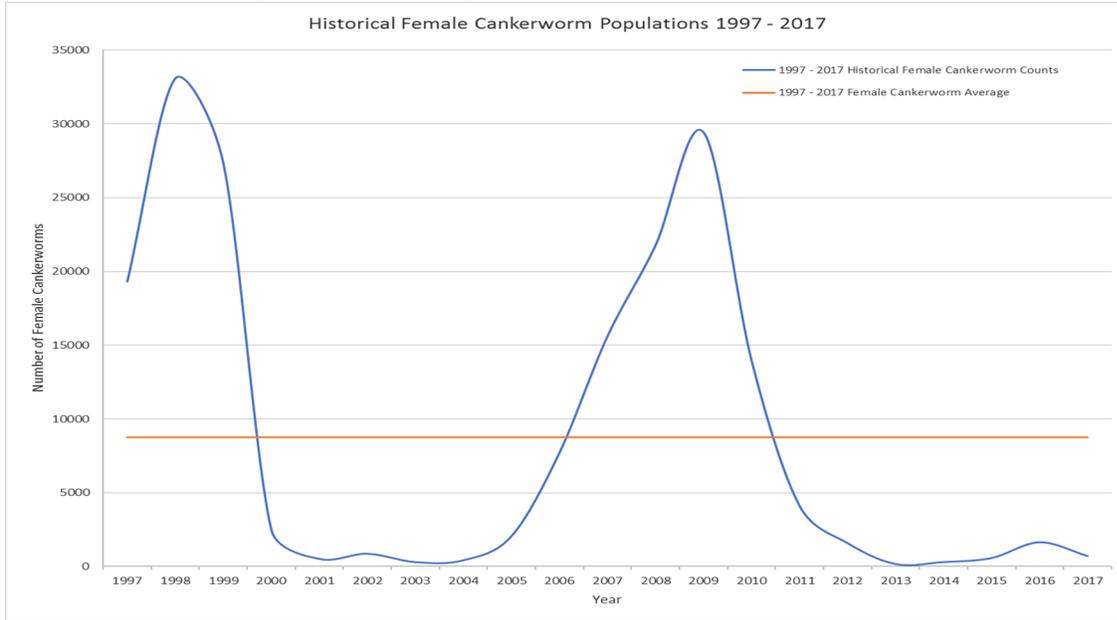## 2017 Trees Treated by Lepidoptera Species (locally known name)

2017 Number of Trees Treated
Regarding Lepidopteran Infestation

Trees Treated for Cankerworms
3%

Trees Treated for Tent Caterpillars
97%

* Tent Caterpillars were the driving issue for response in spring 2017

Spring Spray Program 2017
Tent Caterpillar and Cankerworm

Status
No Treatment
Treatment Completed

Pest Control - Trending Populations Going forward

Historical Female Cankerworm Populations 1997 - 2017

* Cylical nature of cankerworm populations since 1997.   Each year is a total sum of female cankerwoms of both spring cankerworm species (Palecrita vernata)and fall cankerworm (Alsophila pometaria).   This does not truly represent defoliation cycle as fall cankerworm larval stage, strattles into the following year.
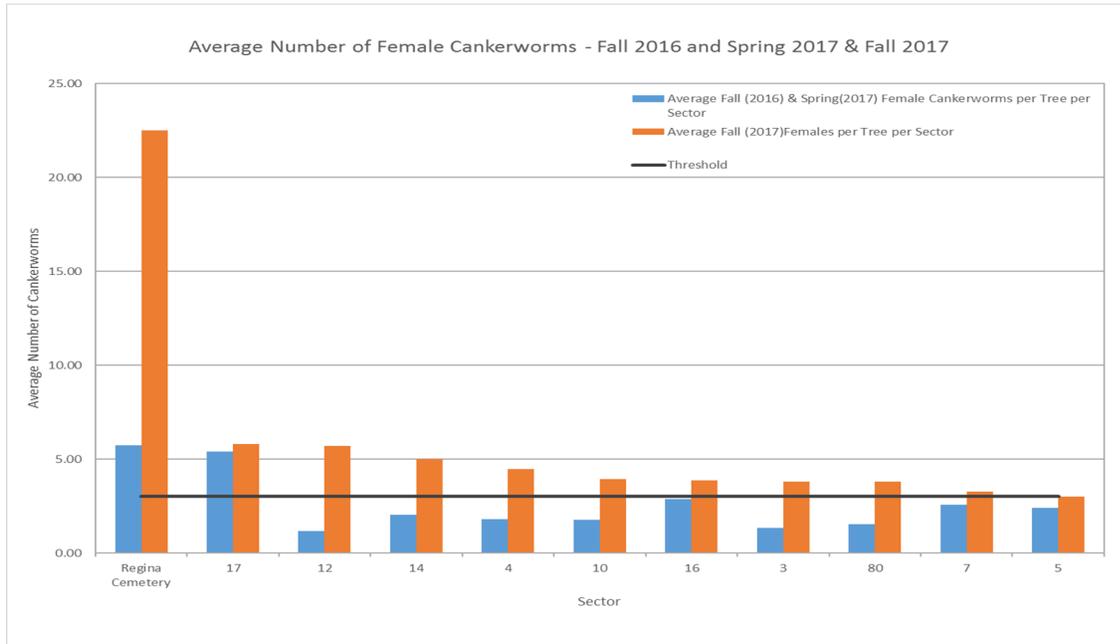

2008 - 2017 City Wide - Seasonal Female Cankerworm Counts
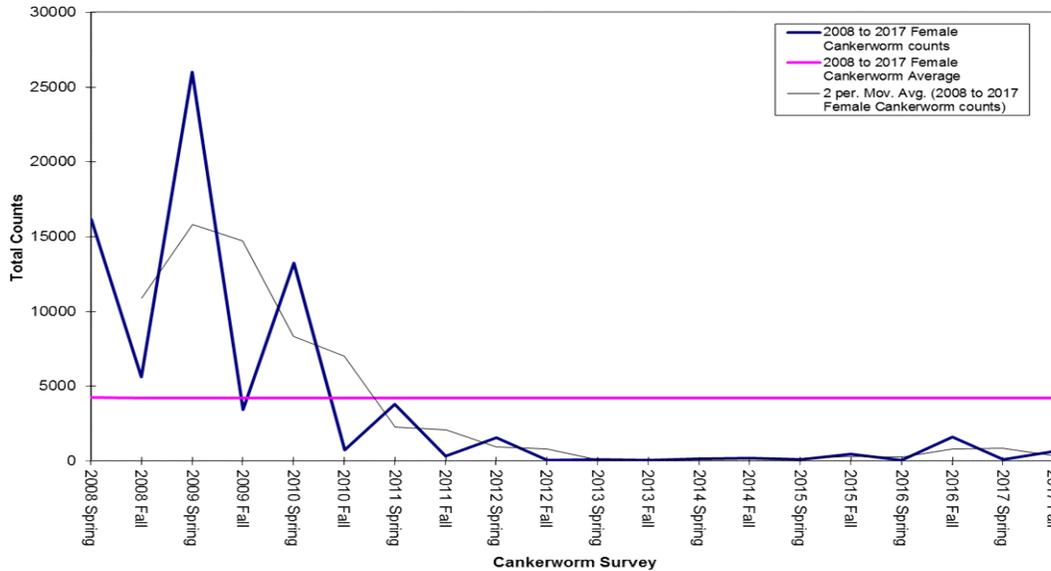
*Driving popluation for defoliation event historically has been the Spring Cankerworm (Palecrita vernata).

2017 Fall Cankerworm Survey

Average Number of Female Cankerworms - Fall 2016 and Spring 2017 & Fall 2017

*The 2017 Fall Cankerworm (*Alsophila pometaria*) is increasing **(Orange)**. This chart compares fall cankerworm numbers for 2017 as compared to the average of both the fall 2016 and spring 2017 cankerworm counts *(Blue)*. Treatment operations are always based on the average of the fall count of the preceding year along with the spring count of the year treated - as this based on the biology of the two species of insect.

**The threshold for determining when treatment should occur is also shown. Initial counts are indicating that 10 sectors may need to be treated during the spring of 2017. This count may be moderated by the spring cankerworm (*Palecrita vernata*) count during April and May of 2018.
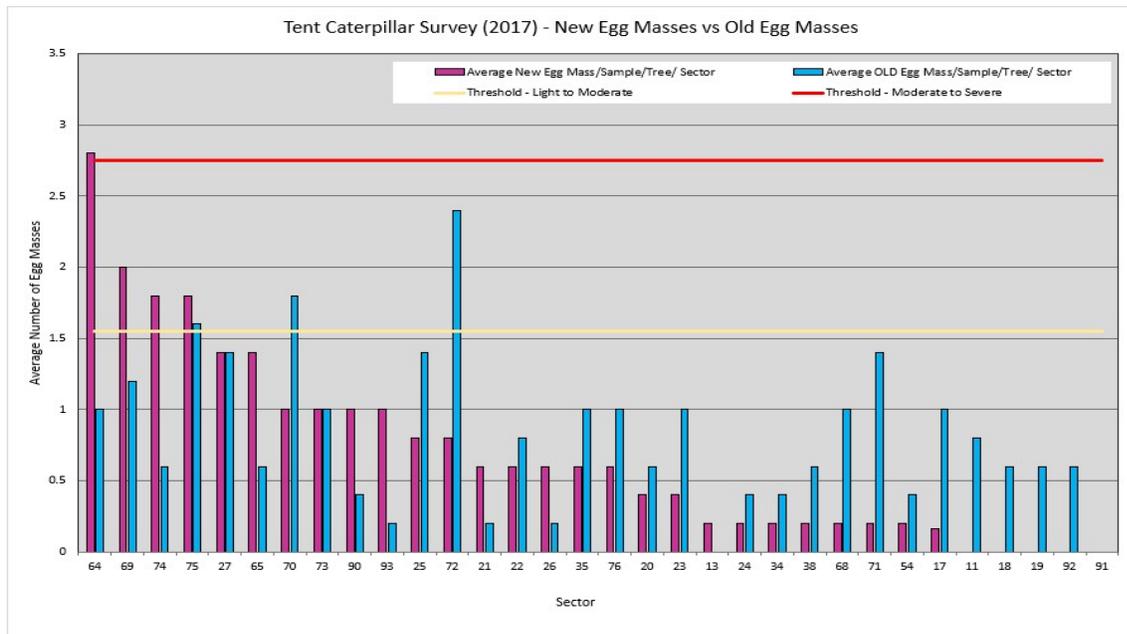
*** Only the top 11 by count of the 66 sectors surveyed are shown on chart.
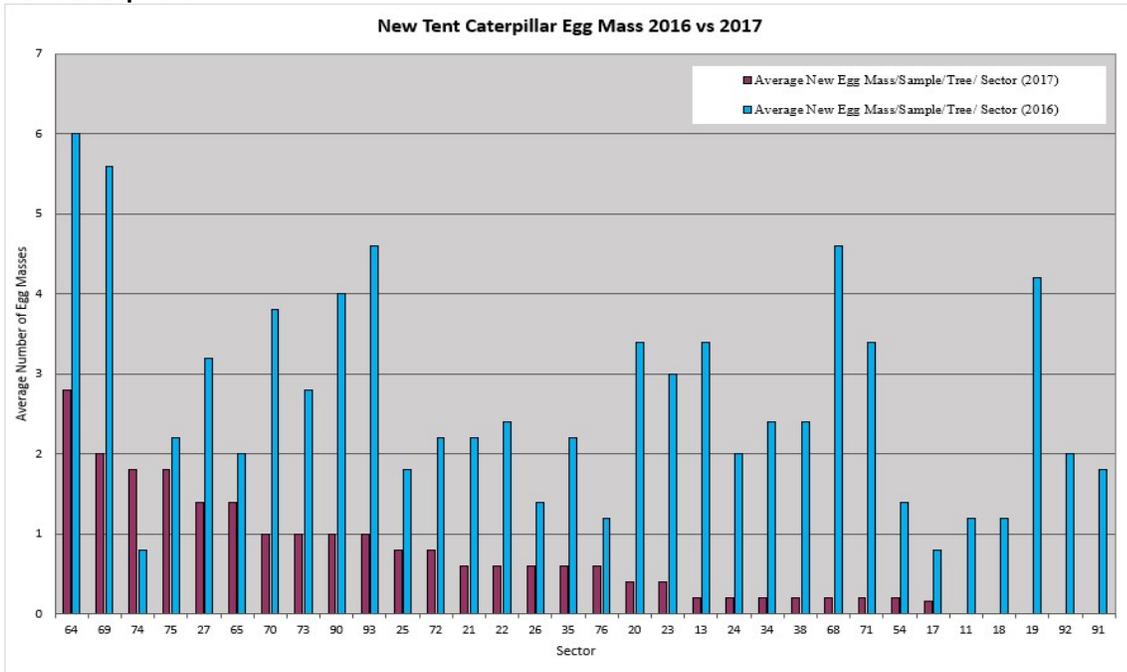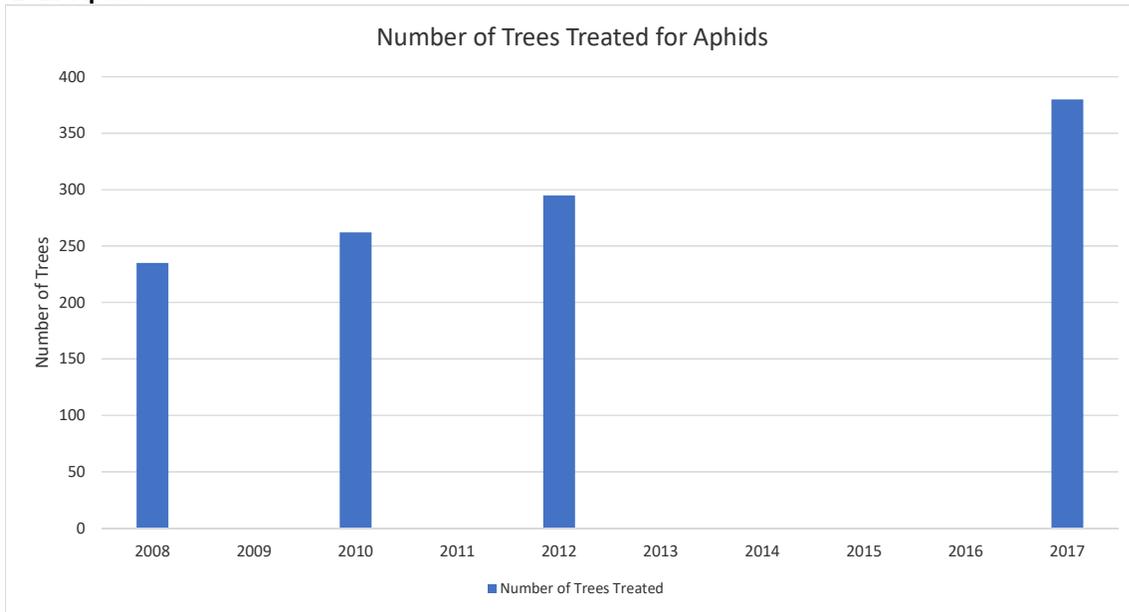
Tent Caterpillars

Egg mass counts indicate future tent caterpillars may be decreasing. Worst may be over. More monitoring to occur in spring 2018 to determine significance of the 2018 generation
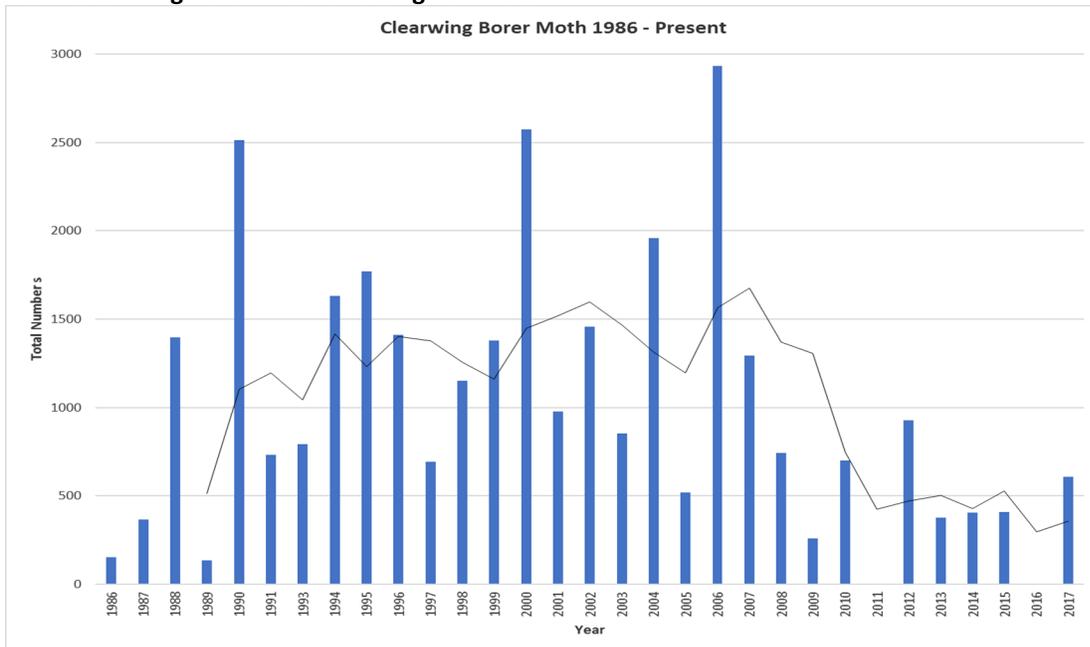
2017 Aphids

Number of Trees Treated for Aphids

* Aphid control was a driving issue from residents.   With the severe drought conditions, aphid populations rapidly increased -. Out pacing biological controls.There was no aphid spraying required from 2013- 2016 inclusive.

2017 Clearwing Borer Moth affecting Ash Trees

Clearwing Borer Moth 1986 - Present

Clearwing borers affecting ash trees - 4yr trendline indicates population is currently at a low level. Clearwing borers affect the structural health of ash trees.   Current strategy for control is intensive pheromeon trapping.
* 2011 no trapping occurred
** 2016 Incomplete dataset