# MAPLE LEAF GOLF AND COUNTRY CLUB TREE CENSUS REPORT

"AN AUDUBON INTERNATIONAL GREEN NEIGHBORHOOD PROJECT"

NATURAL RESOURCES COMMITTEE

FEBRUARY 2018

# Project Background

Maple Leaf Golf and Country Club (MLG&CC) is a senior residential community located on 272 acres of property. Prior to hurricane Charlie (2004) the community had over 5000 trees which were ravaged by the storm, and a significant number were lost but replanted with natural Florida species by 2017. In September 2017 we had further losses, although minor (65 trees) due to hurricane Irma. The tree replacement costs in concurrence with expenditures related to disease issues, specifically for certain palms, pines and citrus remains unknown. Funding for new trees comes from corporate, community memorial, beautification, golf course and resident initiatives. As in the past, we lacked detailed knowledge on the number, type, location, or health of trees in our community. Therefore, in 2018 the Natural Resources Committee proposed a tree census as an Audubon International Green Neighborhood Project to address these shortcomings.

# **Project Objectives**

- Identify all major trees and palms in the community and establish a monetary value, to be included in the park's depreciation value
- Document the approximate location and health of the tree landscape and provide a definitive cost analysis for the current removal strategy of diseased Queen palms.
- Provide data that can be used in the preparation of a tree replacement strategy and creation of recommended plantings list.
- Record the data in an electronic format on the Corporate website that will preserve information and make it accessible to the public
- Provide data for improving wildlife habitat and meet a Certified Audubon Golf Course objective.
- Increase community knowledge, awareness, and participation on the environmental aspects of our park.

## Project Design

We divided the residential community into 26 sectors and the golf course area into 10 sectors. Maps () of the 36 sectors were prepared, printed, and distributed to the 60 plus recruited volunteers. We assigned *Appendices I and II* two counters to each residential sector and asked them to conduct a census between February 4-9, 2018. The Project coordinators counted the golf course sectors. We provided handouts listing known tree and palm types, a printout of leaf type pictures and conducted a  $\frac{1}{2}$  day PowerPoint training session on tree identification (slides, web site assistance, etc.). All this information and a photo gallery of known trees and palms were placed on a shared drive so counters could utilize cell phones and iPads.

We included a double-blind count using a pair of experienced counters and a pair of inexperienced counters. We asked all counters to place flags on non-identified trees, take pictures, record location, and notify a Project coordinator. A Project coordinator was responsible for inspecting each count sheet and performing a general visual inspection of the sector to corroborate the reported data. All non-conforming data was confirmed or corrected by a coordinator. Trees that could not be identified by a coordinator were posted on-line for the opinion of dendrologists in the public domain.

## Data Observations

The data is tabulated as follows: Table 1. Summary of trees and palms. Table 2. Residential trees. Table 3. Residential palms. Table 4. Golf course trees. Table 5. Golf course palms Table 6. Residential fruit trees.

## Technical Data

Our volunteers counted eight thousand seven hundred and twenty-seven trees. Of these, 7668 trees are in the Park domain and 1059 are on the golf course. The Park had 6063 palms, 1257 deciduous/evergreen/conifer trees+ and 348 fruit trees. The golf course had 514 deciduous/evergreen/conifer trees and 545 palms. We identified 41 different tree types, 32 types of palms and 21 varieties of fruit tree\*.

The most popular varieties in the Park are: 158 Arborvitae (cedar), 142 Slash Pine, 111 Norfolk Island Pine, 92 Oak (Live, Laurel, Swamp, Silk & Sand), 77 Bottlebrush, 62 Magnolias, 61 Holly, 50 Black Olive and 56 Sea Grape. The prevalent palms were: 2235 Cabbage (Sabal), 1332 Pygmy Date, 811 Queen, 490 Foxtail, 324 Areca, 94 Cuban Royals (there was only 1 in 2006), 89 Mini-royal and 47 Bismarck palms.

The golf course had 205 Slash Pine, 107 Oak (mostly Live Oaks), 44 Cypress, 22 Tallow, 22 Black Olive, 19 Myrtle (Crepe, Wax & Salt), 17 Bottlebrush, 14 Holly and 10 Giant Eucalyptus. There were 431 Cabbage Palms, 50 Saw Palmettoes, 30 Queen Palms and 18 Washingtonian Palms. There were over 50 Carrotwood and Brazilian Pepper trees in two habitat areas that were not counted as these invasive species are scheduled for removal.

#### **Technical Notes**

\*Two fruit tree varieties, Coconut and Acai are from the palm family but were included in the fruit tree count. +Nomenclature for evergreen trees can be challenging. Evergreen trees that bear cones are considered conifers, but not all conifers are evergreens. A few species of conifers such as bald cypress are deciduous conifers as they lose their leaves. The Norfolk Island pine is an evergreen conifer but is not a true pine. Slash pine, Arborvitae (cedar), Juniper and Holly (Eagleston, East Palatka, Dahoon and Yaupon) are classified as evergreens. Interestingly most of our oaks (live, sand, swamp and laurel) are evergreens.

Many of the trees counted are considered invasive. These were Brazilian Pepper, Carrotwood, Strangler Fig, Giant Eucalyptus, Indian Rosewood and Chinese Tallow.

We had trouble identifying oak trees. Our expectation was to find primarily live oak and a few laurel oak trees. Presently we identified four types of oak (live, laurel, swamp laurel {water}, and silk) and need to confirm a sand live oak. A possible sixth type of oak is being researched.

We were amazed at the number of different fruit trees. At least twenty-one different types were identified. We imposed a classification criterion that a tree should be over six feet tall to qualify in the count.

Ligustrum and Viburnum were not on the original tree list as they were considered shrubs. However, many were well over six feet tall and presented as unidentified. Those flagged for identification were counted but it is likely this survey underestimates them.

## **Project Accuracy**

The project included a double-blind count in one sector as a control. A team of knowledgeable counters was compared against a team of less experienced counters. We gauged the overall accuracy of the count using three measurements. The first term was the count error. This was the difference between the two results for each tree/palm counted as a percentage of the total sample size established by the experienced counters. The second term applied was the identification error which was the number of trees/palms that each team identified differently expressed as a percentage of the total sample size. The last and most important statistic is the corrected error, the measurement that represents the realistic inaccuracy after the outliers were checked and corrected by a Project coordinator. The palm count and identification errors were extremely good at 2.5 % and 2.2 % respectively. The reason for this low error result we feel was related to a) the low ambiguity in palm types and b) the large sample size of 320 palms. The error was small enough that a Project coordinator did not perform a corrective check. The tree count error was greater being 14 percent and the tree identification error worse at 26%. This result we feel was a factor of the small sample size (35 trees of which 15 were fruit trees), and the mis-identification of four buttonwoods as rosewoods, a bottlebrush as a powderpuff and the non-identification of two camphor trees. Inspection of the differences and correction by a Project coordinator resulted in a corrected error of 5.7 %. We think these error rates are representative of the overall survey.

## **Observations and Recommendations**

A conservative estimate for the value of our current tree inventory is in the range of 1.7 million dollars. Presently we have significant citrus health problems for grapefruit and orange trees and disease issues affecting our queen and sago palms. Hurricane Charlie (2004) destroyed the high canopy habitat and we have still not recovered the lost pine trees, that housed owls, great blue herons, hawks, peregrines, not to mention the various cats and other animals that use them. The 2011 slash pine replacement program headed by Enid Lund meet with limited success. Two factors that caused a setback were lack of water and loss of small trees to lawn mowers and weed eaters. Older trees removed from the nursery in 2016 did not transplant well, primarily because they were not in containers and watering needs were not meet.

The NRC may attempt this Program again by establishing a nursery in the maintenance area green space. Irrigation has been cited as a necessity. It is hopeful that knowledge gained from by the initial program will increase the success rate. The NRC is thankful for the funding made available by the Maple Leaf Tai Chi Club.

Tree replacement type and location in the Park is being coordinated by the NRC and the Maple Leaf Superintendent for Grounds and Golf. A tree replacement strategy was included in the 2018 golf course rejuvenations project. and various areas have been identified for replanting. Green space areas in the Park areas are being replanted with black olive, trumpet and pine trees in addition to various palm varieties. This program has been funded by the Garden Club and should increase nesting sites for our smaller birds.

## Acknowledgements

The Natural Resources Committee was proud to manage this project on behalf of Maple Leaf Golf and Country Club, an Audubon International Green Neighborhood member. This project required the involvement of over sixty residents who donated a significant amount of their time and experience. We are grateful for their efforts and delighted with the enthusiasm and interest.

#### **TABLE 1. SUMMARY OF TREES AND PALMS**

	Residential	Golf		Residential	Golf	Odd	Number	Sector
	Trees	Trees		Palms	Palms	Trees		
Arborvitae	158		Areca	324		Fruit trees		
Bottlebrush	77	17	Banana	34		Acai berry	1	12
Buttonwood	6	5	Bismarck	47		Cherry	1	1
Carrotwood	20	11	Bottle	16		Coconut	2	9, 14
Cypress	2	44	Bamboo	1		Рарауа	2	16, 9
Credendum	3		Coontie	4	4	Mulberry (white)	1	9
Cassia	22	1	Cat	24		Lychee	1	11
Myrtle	44	19	Cardboard	3	2	Sugar apple	1	12
Camphor	11	1	Cabbage (Sabal)	2235	431	Persimmon	1	13
Dragon tree	58		Canary island date	177	1	Peach	1	21
Giant Eucalyptus	9	10	Chinese fan	37	4	Mango	1	1
Holly	61	18	Dragon	116			12	
Hong Kong orchid	23	1	Fox	490		Trees		
Jacaranda	4	5	Paurotis	12		Acacia	1	4
Jamaican blue mahoe	4		Pygmy date	1332	4	Red Cedar	1	1
Juniper	14		Pindo	77		Podocarpus	1	2
Japanese blueberry	4	2	Queen	811	30	Golden Rain	1	26
Mahogany	17	2	Royal	94	1	Tibuchana	1	26
Ligustrum	36		Royal (mini)	89		Viburnum	5	14
Magnolia	62		Sago	48		Silk Oak	2	7
Maple	21	22	Saw palmetto	42	50		12	
Live Oak	60	104	Sylvestre	6				
Laurel Oak	25	1	Triangle	28		Palms		
Water Oak	5	1	Washingtonian	4	18			
Olive	53	22				Bamboo	4	9
Powderpuff	17					Pony Tail	1	5
Pine (Slash)	142	205				Pindo Jelly	1	7
Pine (Norfolk)	111					Alexander	3	26
Rosewood	17	1				Fishtail	1	25
Rubber Tree	16					Feathered foxtail	2	
Sea Grape	56							
Tabebuia (trumpet)	25	3					12	
Tallow	4	22						
Umbrella	42	4						
Brazilian pepper	16							
TOTALS	1244	513		6051	545			

#### TABLE 2. RESIDENTIAL TREES

	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8	Sector 9	Sector 10	Sector 11	Sector 12	Sector 13
Arborvitae	9	13	1	6	16	22	4	15	2	3		8	12
Bottlebrush	1	1	1		5	5	6	3	1	1	2	4	8
Buttonwood		1			3					1			
Carrotwood						3						1	2
Cypress									1				
Cleodendrum										1			
Cassia	2	1	1	2	3	2						2	
Myrtle	1		2		4	2		3	11		3	2	2
Camphor	1			1	1	1		3	1				
Dragon tree		1		9	1	1		2	4	2	5		3
Giant Eucalyptus			1				2	4					
Holly	3				9	3		9	4	1	1	7	2
Hong Kong orchid	1		1	3		1		3			2	1	
Jacaranda		1						1					
Jamaican blue mahoe		0						1					
Juniper		1	7							1			
Japanese blueberry													
Mahogany			1	2	3	3	2						
Ligustrum	3		3		2	2	1	3				4	3
Magnolia	1	3	1	5	5	3	4	2	4	1	3	4	3
Maple	2			3	3		1		2	1	5	1	
Live Oak	3	1	2	1	3	6	1	1	2	4	4	4	4
Laurel Oak	1			1		2			1	5			2
Water Oak				1				1	1				
Olive	2	2	2		3	2	6	6	4	1	1	1	
Powderpuff		1	1		5	2			1		2		
Pine (Slash)	5	1	1		2	12	1	30			1	7	1
Pine (Norfolk)	10	6	2	4	3	12	4	2	2	6	3	4	9
Rosewood					13	1			1	1			
Rubber Tree		3							1	3		1	
Sea Grape	10	2	1	6	2	9	2		5	1	3		1
Tabebuia (trumpet)		1		9	4			1		2		1	
Tallow								1	1				2
Umbrella		5	1	1	4		2		2		4	2	
Brazilian pepper	3					1	1						

#### TABLE 2 cont'd. RESIDENTIAL TREES

	Sector 14	Sector 15	Sector 16	Sector 17	Sector 18	Sector 19	Sector 20	Sector 21	Sector 22	Sector 23	Sector 24	Sector 25	Sector 26
Arborvitae	10	5	8		5				4			15	
Bottlebrush		1	2		8	9	5			4	4	6	
Buttonwood												1	
Carrotwood	3				2	4			1	1	3		
Cypress			1										
Cleodendrum	1	1											
Cassia			1	1			1		1	1	2		2
Myrtle	4	6					1				2	1	
Camphor				2						1			
Dragon tree	1	4			23		1					1	
Giant Eucalyptus			1			1							
Holly	3	1	3			1		1	1	3		4	5
Hong Kong orchid					5	1			1	1		2	1
Jacaranda		1											1
Jamaican blue mahoe					1					1	1		
Juniper						1				2		2	
Japanese blueberry	1	2			1								
Mahogany					2							3	1
Ligustrum	1			2					4	1	3	4	
Magnolia			2		3	1	2	5				3	7
Maple					2					1			
Live Oak		1	1		5	3			3	5	3	2	1
Laurel Oak						1			7	1	3	1	
Water Oak							1				1		
Olive	3	1	5		1	5	3	1	1			1	2
Powderpuff						2					2	1	
Pine (Slash)	5		1		20	17	5	1	6	10	7	6	3
Pine (Norfolk)	2	5	11		7	3	5		3	1	5	1	1
Rosewood							1						
Rubber Tree	1				3	1				2	1		
Sea Grape	2	2	1		1		2				2		4
Tabebuia (trumpet)	2				3					1	1		
Tallow													
Umbrella	5	2			9	2	1	1				1	
Brazilian pepper	3		3	2					3				

#### TABLE 3. RESIDENTIAL PALMS

	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8	Sector 9	Sector 10	Sector	Sector	Sector
Areca	8	15	2	10	42	20	11	14	2	15	8	27	15
Banana	1			2		6		3	1		1	3	1
Bismarck	2	3			5	1		3		2	1	2	1
Bottle									2	1			
Bamboo	1												
Coontie	1				1					1			
Cat	1									2		4	
Cardboard										1			
Cabbage (Sabal)	82	124	84	149	160	155	92	41	83	50	32	72	48
Canary island date	4	4	1		13	5	12	5	8	13	5	11	9
Chinese fan	3	5	2	3	2	5							1
Dragon	13	13		3	13	10		2	10	2			
Fox	17	16	9	14	33	37	12	6	22	4	21	65	21
Paurotis	4	1		2				1					
Pygmy date	72	84	35	55	96	65	40	50	51	14	50	76	47
Pindo	3	5	3			10	1	3	9	1		2	
Queen	50	35	12	16	24	26	15	23	32	14	10	28	43
Royal	4			7		2		12	2	2	1	13	5
Royal (mini)	1	2	1	16	8	3	1		2	1		25	
Sago	1	5	1	2		1	2	1	5		6		7
Saw palmetto		4		3	2	2		3		2	2	6	
Sylvestre										1	3	2	
Triangle								6	2	2			

#### TABLE 3 cont'd. RESIDENTIAL PALMS

	Sector 14	Sector 15	Sector 16	Sector 17	Sector 18	Sector 19	Sector 20	Sector 21	Sector 22	Sector 23	Sector 24	Sector 25	Sector 26
Areca	9	1	30	2	9	27	7	3	20	1	13	11	2
Banana	1		2	1	1	1	3		2	2		3	
Bismarck				5	7				3			5	7
Bottle	3	1	1		4			1			1	2	
Bamboo													
Coontie				1									
Cat			5		1								11
Cardboard													2
Cabbage (Sabal)	84	21	43	78	87	54	24	56	43	38	188	138	209
Canary island date	9		5	11	9	4	1		7	11	1	27	2
Chinese fan	2		1	3	1	3	3				1	2	
Dragon	1		6	13	19		1	1	3		1	4	1
Fox	11	5	18	27	64	10	6	2	21	0	9	25	15
Paurotis													4
Pygmy date	16	13	56	127	116	58	21	27	61	21	40	30	11
Pindo			2	3	3		3		5	21			3
Queen	21	25	30	58	83	35	39	27	86		49	23	7
Royal	2				5			2	2		14	16	5
Royal (mini)	1		3	6	2	2	1	1	2		2	1	8
Sago		5	1	1	4	1	3			2			
Saw palmetto	1		1	3	2		1			4	1	5	
Sylvestre													
Triangle					7		2			6		3	

TABLE 4. GOLF COURSE TREES													
	Sector G1	Sector G2	Sector G3	Sector G4	Sector G5	Sector G6	Sector G7	Sector G8	Sector G9	Sector G10			
Bottlebrush			2	2	9				3	1			
Buttonwood		1					4						
Carrotwood							10	1					
Cypress	4	4	4			29		3					
Cassia								1					
Myrtle	5	2		1	10					1			
Camphor			1										
Giant Eucalyptus							10						
Ficus	2												
Holly	4	4	1			3		3	3				
Hong Kong orchid				1									
Jacaranda					5								
Japanese Blueberry		1					1						
Mahogany							1		1				
Ligustrum				1									
Magnolia		1		2		1	4						
Maple													
Live Oak	12	11	2	4	7	30		6	23	9			
Laurel Oak				1									
Water Oak		1							2				
Olive			2				14	5		1			
Pine	10	10	5	20	35	5	32	53	12	23			
Pine (Norfolk)							1						
Rosewood					1								
Sea Grape													
Tabebuia (trumpet)		1						2					
Tallow					22								
Umbrella					4								

TABLE 5. GOLF COURSE PALMS													
	Sector G1	Sector G2	Sector G3	Sector G4	Sector G5	Sector G6	Sector G7	Sector G8	Sector G9	Sector G10			
Coontie	4												
Cardboard	2												
Cabbage (Sabal)	45	13	21	26	76	80	56	60	30	24			
Canary Island Date		1											
Chinese fan	4												
Fox													
Pygmy date	1	2		1									
Queen	20		5				4		1				
Royal						1							
Sago													
Saw palmetto	3	9	10	2	15		6			5			
Washingtonian							18						

TABLE 6. Residential Fruit Trees													
	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8	Sector 9	Sector 10	Sector 11	Sector 12	Sector 13
Avocado		5			1	1			1		1		1
Grapefruit	4			1	2			2	2	1		2	3
Lemon	1	1		4	1	2	1	1	2	2	1	1	
Lime	2				3	3		1		1		3	
Orange	8	15	3	10	12	7	1	12	5	5	3		11
Star Fruit					1	1							
Kumquat	1	1				3				2			
Loquat		11	1		1	4	1		2	1			4
Calamondin		1		1									1

	Sector	TOTALS												
	14	15	16	17	18	19	20	21	22	23	24	25	26	
Avocado	1		1	2		5				1				20
Grapefruit			3	3		1	1	1	1		2			29
Lemon			1	2		1	2	1	1		2	3		30
Lime				2	5		1					2		23
Orange	3	9	11	19	9	3	4	5	1	7	15	6		184
Star Fruit		1	1			1								5
Kumquat											1			8
Loquat				1			2					1	3	32
Calamondin	1											1		5