



**AGENDA
CITY TREE COMMITTEE
APRIL 7, 2021
10:30 AM
CITY HALL COMMISSION CHAMBERS
204 ASH STREET
FERNANDINA BEACH, FL 32034**

- 1. ROLL CALL**
- 2. PLEDGE OF ALLEGIANCE**
- 3. INTRODUCTION**
 - 3.1 Welcome to the Tree Committee
 - 3.2 Goals from the City Commission
 - 3.3 Tree Committee expectations
 - 3.4 Timeframes & deadline to present a report to the City Commission
- 4. INTRODUCTION OF MEMBERS**
 - 4.1 Members' expectations
- 5. FRAMEWORK OF PLAN**
 - 5.1 Possible LDC code based changes
 - 5.2 Maintenance & preservation of existing canopy
 - 5.3 Replacement & new planting
 - 5.4 Events & community outreach
 - 5.5 REVAMP centralized information - www.fbfl.us/TREES
- 6. MEMBER COMMENTS**
- 7. HOMEWORK**

- 7.1 a. Get familiar with tree related documents
 - i. Tree related documents:
 - ii. LDC Chapter 1, Section 1.07.00 (Definitions)
 - iii. LDC Chapter 4, Section 4.05.00
 - iv. LDC Chapter 11, Section 11.08.03 (Penalties)
 - v. Fernandina Beach 2009-2019 Tree Canopy Assessment 04/14/20
 - vi. Fernandina Beach Tree Management Plan 2019-2024
- 7.2 Data gathering - Choose a city section and build a list of areas where there is a need for tree planting

8. MEETING CALENDAR

9. ADJOURNMENT

All members of the public are invited to be present and be heard. Persons with disabilities requiring accommodations in order to participate in this program or activity should contact the City Clerk at (904) 310-3115 or TTY/TDD 711 (for the hearing or speech impaired). All interested parties may appear at said meeting and be heard as to the advisability of any action, which may be considered with respect to such matter. For information regarding this matter, please contact the Planning Department (904) 310-3135.



42 Masters Drive
St. Augustine, FL 32084
Tel: 904.540.1786
www.carterenv.com

City of Fernandina Beach Tree Canopy Analysis 2009 – 2019

Introduction

As the City of Fernandina Beach has grown, maintaining sustainable urban forests has become a priority. In 2009, the City contracted a Tree Management Plan to assess the cultural, economic and environmental aspects of its urban forests. Canopy cover within the City was assessed as part of this plan. This was done by manipulating aerial imagery in Adobe Photoshop to isolate tree features. The report found total tree canopy coverage to be 37%. It was recommended when future aerals became available canopy cover estimation could be done to track changes over time.

This analysis continues the work of the 2009 assessment, using Geographic Information Systems (GIS) and statistical algorithms to estimate tree canopy coverage from 2009 to 2019. A GIS-based feature extraction model was created to assess canopy change from 2009 – 2019. Essentially an exercise in computer image recognition, the model classified features by their unique spectral signatures within aerial imagery. True color aerial imagery consists of three bands - red, green and blue (RGB), each color band containing a value between 0 and 255. Examples of unique features such as water, pavement, trees, etc. were manually delineated and inputted into a model creating unique definitions for each classification. A classification algorithm then correlates aerial imagery with the sample definitions to extract specific features. The model estimated a total of 3,577 acres of canopy coverage in 2009 and 3,137 acres in 2019 – a 12% loss. The text below describes the technical methodology, results and discusses the intricacies and limitations of this analysis.

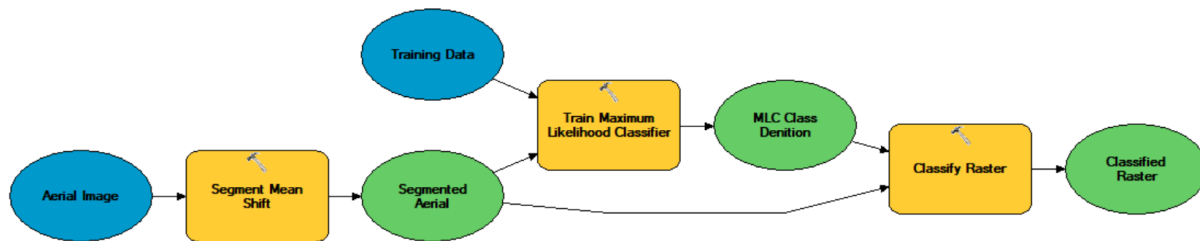
Methodology

Segmentation and classification tools within ESRI's ArcGIS were used to extract features, grouping those with similar spectral signatures into defined classes. Below describes each step of the model:

- **Segmentation of Aerial Imagery:** Segmentation provides a simplified version of the original aerial. It generalizes and groups similar spectral signatures causing less noise in the overall analysis. Image

segmentation was performed via the Segment Mean Shift tool. This method uses a moving window that iteratively calculates the average pixel value to determine which pixels should be included in each group. The result is a grouping of image pixels characterized by an average color value.

- **Training Sample Data:** Sample data tells the model what a specific class should look like. These samples were manually delineated across the study area identifying tree canopy, built areas, open water, fields, bare earth and estuarine. Sample values should be normally distributed, and an ample number of features are needed to produce statistically significant results. The sample data was then inputted into a training algorithm – in this case, a Maximum Likelihood Classifier (MLC). Values of pixels within each class were statistically correlated via the training process and a definition was created as the tool output.
- **Classification:** The Classify Raster tool then performed an image classification on the segmented aerial image using the created MLC classifier definition file.



Workflow of the Tree Canopy Analysis Model

- **Manual QA/QC:** The final step was to manually review the model results and clean up any significant erroneously classified areas.

Results

The model estimated 3,577 acres of canopy coverage in 2009 and 3,137 acres in 2019 – a 12% loss. Based upon the 8,051-acre Fernandina Beach City Limits, tree canopy constituted 44% of the study area in 2009, and 39% in 2019. Percentage canopy cover was calculated in reference to the 8,051-acre study area. Graphic results can be seen on the maps supplied with this report, Figure 1: 2009 Model Results, Figure 2: 2019 Model Results and Figure 3: Tree Canopy Change Analysis.

Discussion

Creation of this sort of image classification model is part art and part science. Many different training algorithm types were explored to find the best results. Within each of the methodologies tried, a number of

different input parameter scenarios were tested. Through this process the “Maximum Likelihood Classifier” algorithm was ultimately chosen.

Model results are only an estimation and should not be treated as an absolute measurement of canopy coverage. It is a reasonable estimation but also a useful tool for analyzing trends. None of these models are perfect and often identify other objects resembling tree canopy, such as marsh, shrubs, shadows, or certain color cars or roofs. Inconsistencies in aerial imagery such as exposure, time of day and season can also make a big difference. Separately delineating deciduous areas ended up making a huge improvement in results. Shadows, especially over grass or other green-colored surfaces often mimicked the spectral signatures of tree canopy.

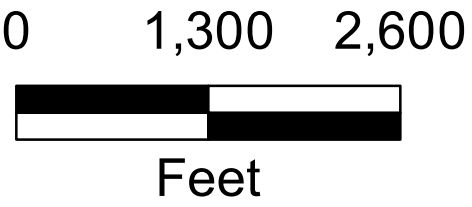
Discerning the difference between shrubs and trees can also be difficult. Additional helpful data to discern differences between shrubs and trees could be via elevation models. Corrected (ground surface) and uncorrected (raw data) LiDAR elevation data can be used to determine the height of objects above ground, for example trees or buildings. The intersection of the already identified color signatures combined with this elevation data could be useful to further fine-tune model results.

Figures 1 and 2 depict manually reviewed and edited model results. In addition, a change analysis was done for Figure 3, which shows areas of significant canopy reduction. The raw output was edited to isolate these areas of larger canopy loss. Outside of these larger areas someone would see a confusing speckled landscape of loss and gain fragments. These were edited out as it looks like noise. Minor variations in the source aerials causes a lot of tiny fragments when comparing differences in years. Results could represent minor tree growth and loss here and there, but could also cause to confuse, showing false artifacts of minor fragmented differences in the 2009 vs. 2019 aerials.

Image recognition technology has infiltrated many disciplines from technology to the natural world. As imagery becomes higher resolution and additional remote sensing data such as detailed elevation becomes available, the accuracy will only improve, providing an increasingly useful tool for urban forest management and beyond.

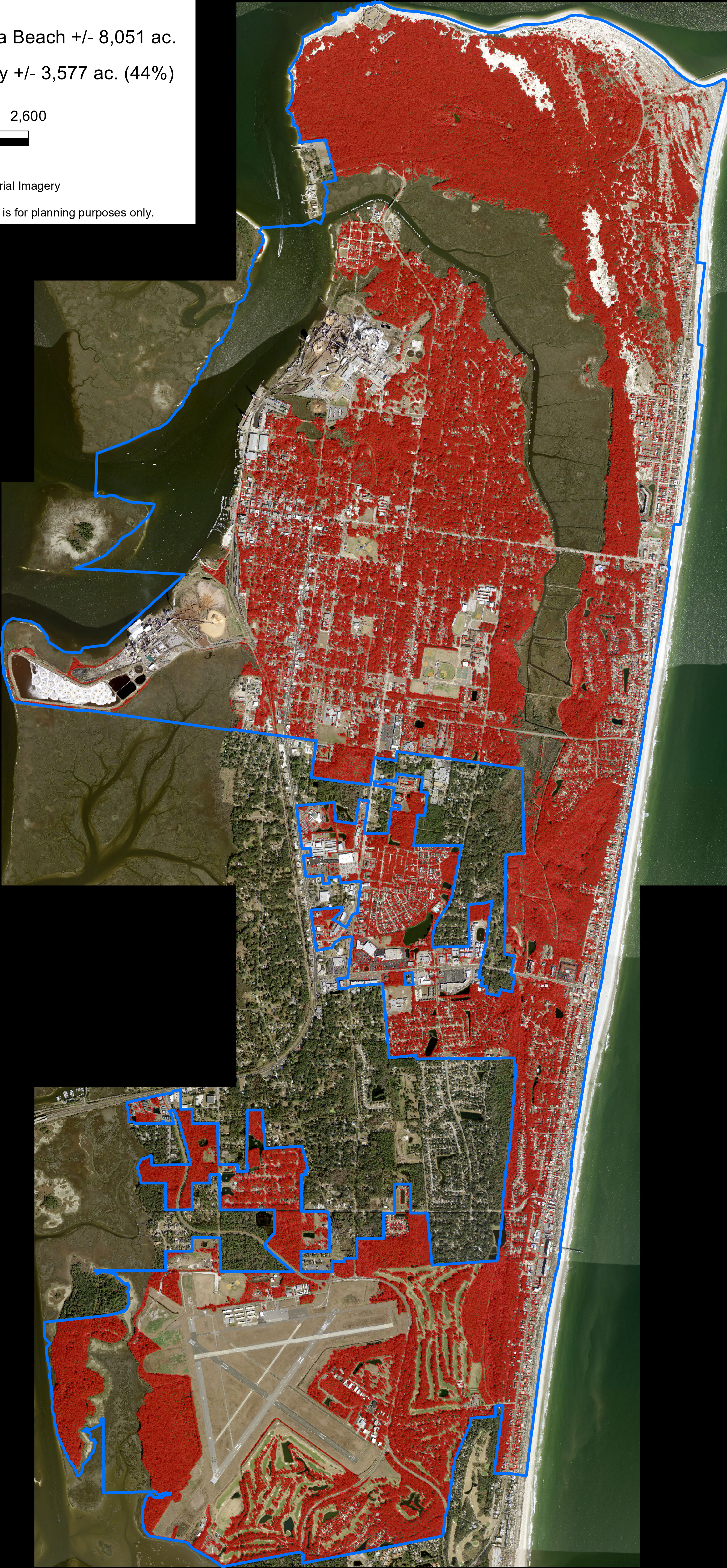
Legend

- City of Fernandina Beach +/- 8,051 ac.
- 2009 Tree Canopy +/- 3,577 ac. (44%)



Sources: 2009 Aerial Imagery

Information represented on this map is for planning purposes only.



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2009 Tree Canopy Model Results
Tree Canopy Assessment
City of Fernandina Beach, Florida

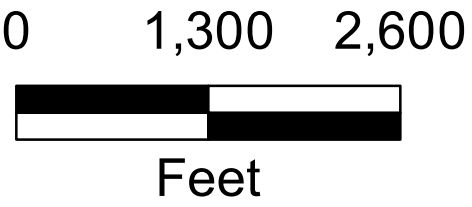
Project: 5.19382

Date: Apr 14 2020

Figure: 1

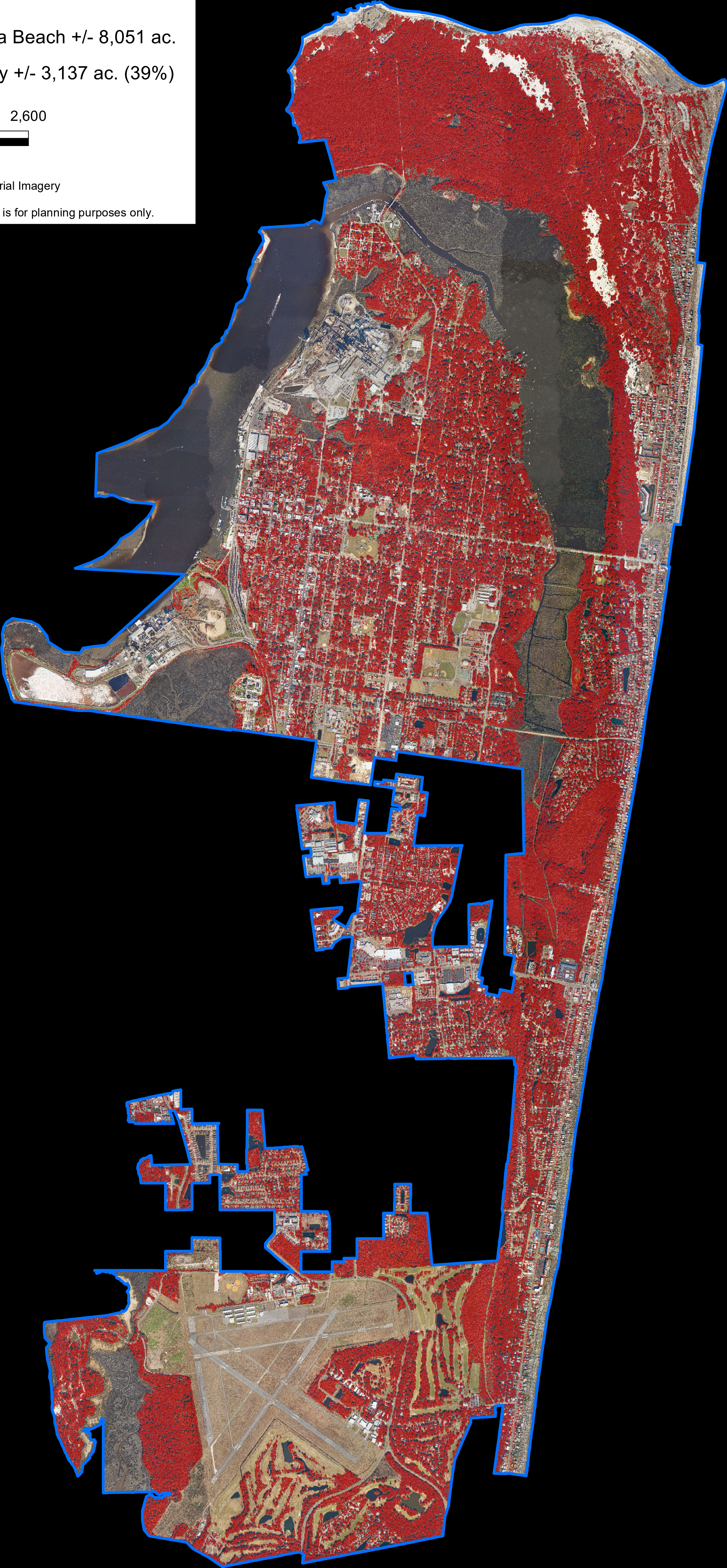
Legend

- City of Fernandina Beach +/- 8,051 ac.
- 2019 Tree Canopy +/- 3,137 ac. (39%)



Sources: 2019 Aerial Imagery

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2019 Tree Canopy Model Results
Tree Canopy Assessment
City of Fernandina Beach, Florida

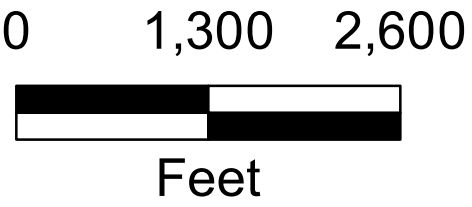
Project: 5.19382

Date: Apr 14 2020

Figure: 2

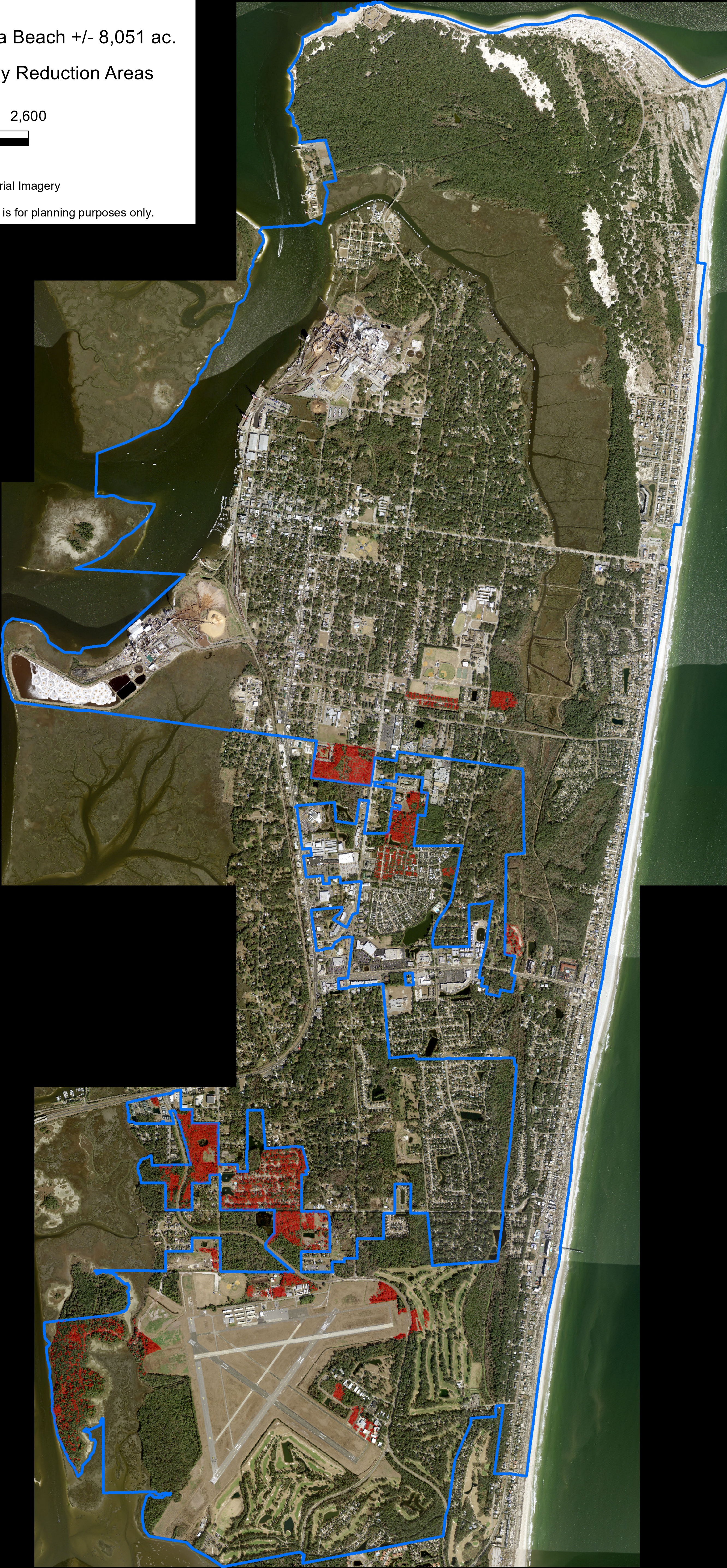
Legend

- City of Fernandina Beach +/- 8,051 ac.
- Significant Canopy Reduction Areas



Sources: 2019 Aerial Imagery

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Tree Canopy Significant Reductions 2009 - 2019

Tree Canopy Assessment

City of Fernandina Beach, Florida

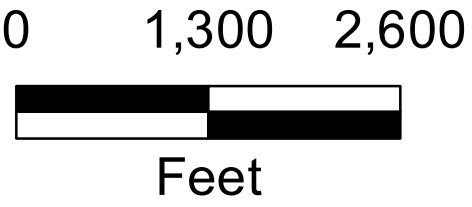
Project: 5.19382

Date: Apr 14 2020

Figure: 3

Legend

- City of Fernandina Beach +/- 8,051 ac.
- Canopy Removed
- Canopy Added



Sources: 2019 Aerial Imagery

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Canopy Change Analysis 2009 - 2019
Tree Canopy Assessment
City of Fernandina Beach, Florida

Project: 5.19382

Date: Apr 14 2020

Figure: 4

2019-
2024

Fernandina Beach Tree Management Plan



City of Fernandina Beach

2019-2024

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KEY HIGHLIGHTS FROM YOUR ARBORIST

TREE INVENTORY SUMMARY (City-owned trees)

In 2009 and 2017, a tree inventory was conducted on over 14,000 City-owned trees. It appears that a small number of forested areas/wetlands were skipped due to inventory costs exceeding the budgeted allocation. This inventory can be found on the Nassau County Property Appraiser's website: (www.nassauflpa.com). The 2009 Selvig inventory report and companion 2010 Master's thesis are available on the City's website: (www.fbfl.us).

CANOPY COVERAGE ANALYSIS (All trees within City Limits)

Did our canopy SHRINK or GROW based on all the assessments? Our current canopy coverage is likely around 39% as 2 reports show. However, there IS a significant difference between the estimates using 2008 and 2009 aerials. Should another historical analysis be done to satisfy our curiosity, or should we simply accept our current 39% and move on?

- **37% Canopy Coverage using 2008 aerials:** This assessment was conducted in 2009 as part of the *Selvig Tree Appraisal*. View pg. 37
- **39% Canopy Coverage using 2018 aerials:** This assessment was conducted by the Nassau County Property Appraiser's office throughout the entire county. By request, they isolated data for the City limits. Did our canopy GROW?
- **44% Canopy Coverage using 2009 aerials AND 39% using 2019 aerials:** Provided in 2020 by *Carter Environmental Services*.

Observation 1 - On the 2019/2009 assessments, comparing the large natural areas where no development occurred. We observed gaps in the interior in 2019, but not in 2009. Could differences be from image quality/shadowing, winter vs. summer, hurricane Matthew (2016), Irma (2017) ... or was there actual canopy loss? Your City Arborist expected to find MORE FOLIAGE in the interior due to normal growth and re-sprouting, even with the 2016-2017 hurricane seasons. The 2009 aerials appear to have over-predicted the canopy percentage across the board.

Observation 2 - All trees retained and planted in new developments will continue to grow and increase the canopy coverage. It is interesting to see this ingrowth already happening in older developments as the Carter report highlights so well! This data is outstanding, even with possible biases. It helps us reflect on past actions and informs our decisions for the future!

GOAL ANALYSIS

In 2019, the Commission set a goal to increase canopy by 5% by 2024. In 2020, the Commission implemented a significant revision to its tree protection ordinance by modifying mitigation ratios from 20/25% to 50% for all development. It is expected that the resulting changes will affect the number of fees paid for mitigation inches, thereby inspiring design choices that preserve more trees onsite.

Finding SPACES to plant requires buy-in from all departments with suitable areas. This remains the City's principal challenge when considering new plantings, especially on a large scale. The City needs to reconsider its planting philosophy for trees in public rights-of-way and modify the Greenway Management Plan to allow for tree plantings. Other ideas for planting can be found in the report.

INTRODUCTION

Forests generally develop over time through a complex interaction of climate, soils, and organisms; an ecosystem that is relatively stable and self-sustaining. Natural or man-made disturbances like wildfire, windstorms, timber harvesting, or planting might occur over large areas from time to time, but the natural process continues for the most part. In an urban environment, the natural landscape may be modified in a smaller area, but in a more drastic and permanent way. As infill occurs, the natural environment becomes fragmented and displaced by fill dirt, concrete, structures, and a hodge-podge of native and non-native vegetation. With long term planning and management, the urban forest can be better preserved, replaced, and shaped with intentionality to compliment society and the environment.

This management plan outlines the goals and methods the City will use to preserve and enhance our urban forest in a sustainable way while accommodating social and economic needs.

TREE INVENTORY SUMMARY (City-owned trees)

The first step in creating a tree plan is to assess the present condition. In 2009 and 2017, a tree inventory was conducted for Fernandina Beach, examining over 14,000 City-owned trees. A small number of forested areas and wetlands were omitted due to time and expense outweighing the usefulness of the data. The tree inventory can be found on the Nassau County Property Appraiser's GIS map (www.nassauflpa.com), utilizing the "Map Layers" tab, under "Planning and Growth Management". By analyzing the data, City staff can make better management decisions.

The 2009 Selvig Tree Inventory and Canopy Analysis report as well as the 2010 Latimer Master's thesis based on the above report are available on the City's website: (www.fbfl.us).

Inventory Results:

Approximately 65% of the trees were located along city streets with the remaining 35% in public spaces. Additionally, nearly 70% of the trees were reported to be in good condition. The data further revealed that 28% of our public trees are live oaks, 19% are sabal palms, and 12% are laurel oaks. The 2009 and 2010 reports recommended increasing diversity through future tree plantings. Even so, we want to use reliable tree species that can tolerate the harsh environmental conditions found in Fernandina Beach. *The Ecology of Maritime Forests of the Southern Atlantic Coast* is an excellent document on local tree species

Canopy Coverage Analysis (All trees within City Limits)

Of course, the City's tree inventory is limited to City-owned trees. To broaden the scope and knowledge of the entire tree canopy within the City limits, aerial photography can be utilized. Although this does not capture tree-specific data, it does provide a more comprehensive snapshot of the canopy to observe and influence changes over time.

Disclaimer: It is important to note that **image analysis results are simply ESTIMATES**. Aerial photos contain many inherent differences (image clarity, pixel color, shadowing, seasons/years, etc.) An estimated 37% Canopy Coverage using 2008 aerials.

This assessment was conducted in 2009 as part of the Selvig Tree Appraisal.

An estimated 39% Canopy Coverage using 2018 aerials.

This assessment was conducted by the Nassau County Property Appraiser's office throughout the entire county. By request, their staff isolated the data for the city limits of Fernandina Beach and verbally reported an estimate of 39% canopy coverage. Did the canopy GROW slightly?

An estimated 44% Canopy Coverage using 2009 AND

An estimated 39% Canopy Coverage using 2019 (See appendix documents).

Before learning about the county's 2018 assessment, City staff contracted with Carter Environmental Services in St. Augustine to conduct an analysis using the current City boundary using aerials from 2009 and 2019. Take into consideration that some properties within the current City limits were not under City ownership in 2009, however they were still included.

Based on the 2018 and 2019 aerials, our canopy coverage is currently around 39%. However, there IS a significant difference between the 2008 and 2009 results.

The assessment based on the 2008 aerials suggests the canopy GREW 2 percentage points (a 5.3% difference). $(3,137_{\text{now}} / 2,979_{\text{then}} \times 100) - 100 = \mathbf{5.3\%}$

The assessment based on the 2009 aerials suggests the canopy DECREASED by 5.3 percentage points (a 12.3% difference). $(3,137_{\text{now}} / 3,577_{\text{then}} \times 100) - 100 = \mathbf{12.3\%}$

	Acres	Percent
FB Total	8,051	100.0
Canopy 2008	2,979	37.0
Canopy 2019	3,137	39.0
Difference	158	2.0
% Difference	5.3	

	Acres	Percent
FB Total	8,051	100.0
Canopy 2009	3,577	44.4
Canopy 2019	3,137	39.0
Difference	-440	-5.5
% Difference	-12.3	

This discrepancy between the 2008 and 2009 aerials may be something we have to accept unless additional analysis work is conducted based on different aerials. However, we could simply accept the current 39% estimate and move on. To begin with, we will compare the large natural areas (where no development occurred) in the 2019/2009 aerials. In 2019 we see gaps in the interior that are largely absent in the 2009 assessment. Why? Could this be differences in image quality, seasons (winter vs. summer), storm damage from Hurricane Matthew (2016), and Irma (2017), or actual canopy loss? Your City arborist expected to find a DENSER canopy in undisturbed areas due to normal growth and re-sprouting, even with minimal storm damage. Could the 2009 aerials have OVER-predicted the canopy percentage in natural areas and throughout the entire city? Yes, perhaps. Can the annual growth rate of every tree (39% canopy coverage) in the city be able to replace some of the simultaneous developments? Yes, easily!

In addition, all the trees retained and planted in new developments will continue to grow and increase the canopy coverage. It is interesting to see this already occurring within older developments as the Carter report has highlights so excellently. Even if there are possible errors, we can use this data to reflect on past behaviors and consider better ways to supplement our canopy.

As part of the assessment, Cater Environmental Services will deliver a speech at the upcoming meeting of the City Committee as the schedule permits. Again, this report is available on our City website: (www.fbfl.us).

TREE VALUATION

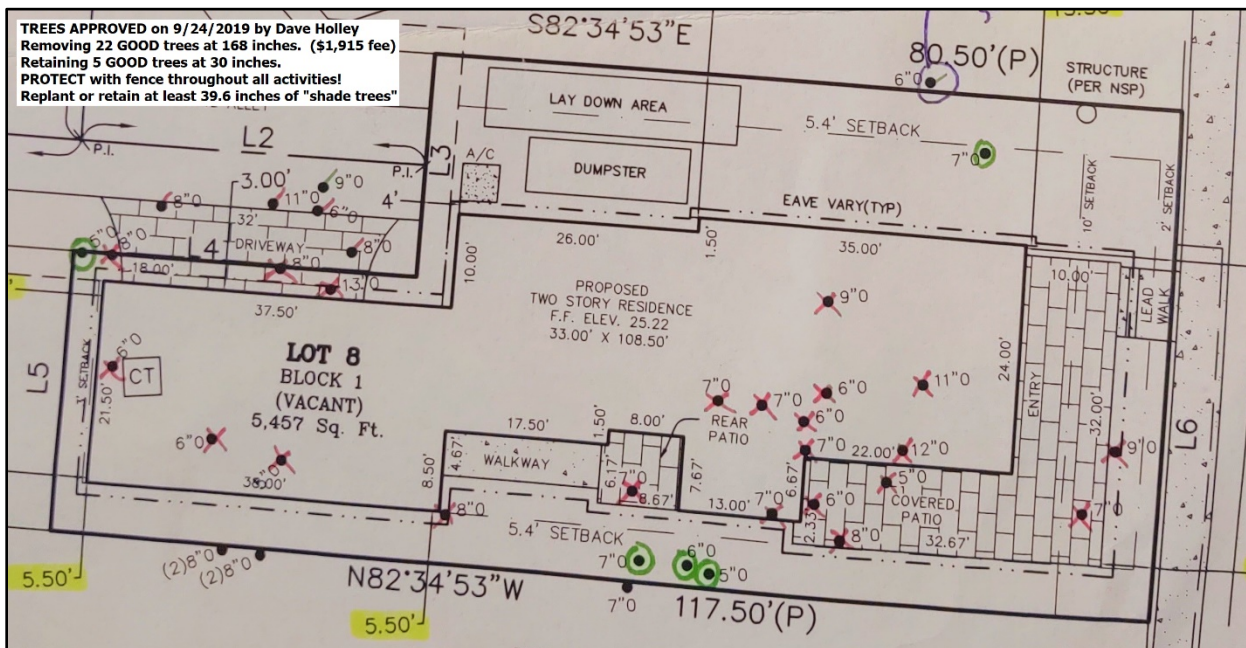
Trees provide a variety of services to people, wildlife, and the environment such as:

- Capturing stormwater (on the canopy, within fallen leaves, and from root absorption).
- Moderating the temperature (making things cooler in the summer and warmer in winter).
- Reducing wind speeds and improving air quality.
- Adding value to residences and businesses
- Maximizing local patronage and tourism for businesses and many more.

Selvig Tree Appraisal used i-Tree software in 2009 to quantify the value of the annual environmental and aesthetic benefits of the 7,000 trees contained in the inventory, and the value totaled \$56,637,455. Some years later, the 2017 inventory provided an additional 7,091 trees for a total estimated value of \$114,000,000.

TREE PLANTING

In 2019, the City Commission established a goal to increase the canopy coverage by 5% before the end of 2024. Also, in May of 2020, the City Commission revised the tree protection ordinance, making tree preservation requirements stricter for new developments. Previously, at least 20% of the inches approved for removal had to be mitigated (retained or replanted onsite) for residential properties and 25% for commercial lots. **The new standard is to mitigate 50%** of the inches slated for removal, but it will not be possible on many small lots.



To mitigate 20%, this plan shows 30 inches being retained. Replanting 9.6 inches is feasible. To mitigate 50%, this site would need to replant 69 inches or about 27 shade trees. Not advised!

This means the tree fund will inevitably collect substantially more mitigation dollars at \$400 per tree. In theory, if all tree funds can be converted into actual trees, this will preserve over 15% more canopy.

Finding SPACES to plant will require buy-in from all departments with suitable areas. However, at some point, the city will run out of amenable spaces for new trees.

ACTION PLAN FOR 5% CANOPY INCREASE:

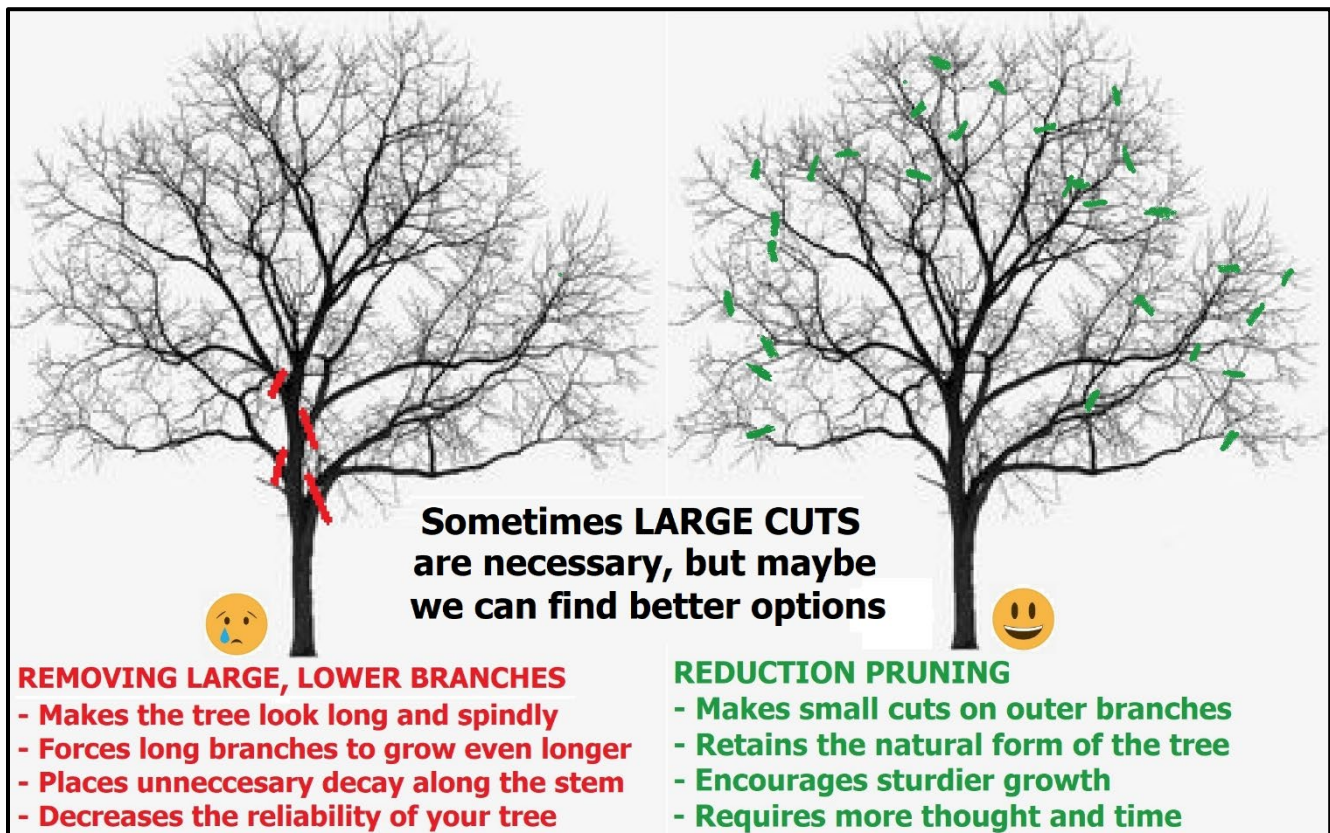
- Arbor Day Plantings – We celebrate FLORIDA Arbor Day in January and NATIONAL in April. In 2020, we celebrated by planting 32 trees at MLK Park and 1 tree at City Hall.
- Emma Love Planting – In February of 2020, we planted 20 trees with students and teachers at Emma Love Hardee. Schools can be excellent places to plant trees!
- Non-profit partnerships – Keep Nassau Beautiful planted 5 trees in City Parks in 2020, and the Junior Woman's Club planted 1 tree.
- Filling in street tree vacancies identified on the GIS tree inventory. Mapping new areas.
- Fernandina Loves Trees – We are encouraging each city resident to plant 1 tree at home.
- Trees for Permits Program – Every time a tree removal is approved, I ask people to let me know if they would be interested in obtaining a free tree if/when they become available. Many people do not respond, although a few have expressed interest.
- Natives for Invasive Replacement Program – Brazilian pepper, Chinese tallow, and Chinaberry are a few non-native plants. If residents agree to remove them, the City will provide replacement trees as an incentive. The first one is currently in the works.
- Adopt a Street Tree – Jacksonville has a program where people can request free trees in their right-of-way if City staff approves. The homeowner would handle the watering.
- Education and tree giveaway at schools – Besides planting trees at schools, we can give away bare root tree seedlings to students to take home and plant.
- Trick or Tree Halloween Giveaway – Bare root tree seedlings can be obtained cheaply. While kids collect candy on Centre Street, a small tree can be given away in a damp, sealed baggie. Even if some trees do not make it into the ground, others will.
- Trees in Parks (Central Park, Lighthouse, Egan's Creek Park, Atlantic Rec Center, Peck Center, MLK Center)– Parks are easy to plant since they are usually free of utilities. However, open spaces must be retained for events and regular use.
- Trees in Bosque Bello– Trees can also be planted on the edges in Bosque Bello cemetery and infilled as declining trees are removed. Understandably, many spaces will be unavailable for planting due to burial plots.
- Trees in Greenway – Similar to parks, the greenway is an easy place to plant, but not as easy to keep watered. Perhaps the best way to improve the canopy here would be to protect natural sprouts from mowing until they are large enough to be considered real trees.
- Trees in Golf Course – Similar to the greenway, the spaces between the greens grow naturally. Trees in maintained areas are mostly mature, and sometimes we lose a few. Although new plantings may not be as beneficial to residents, there's certainly ample space.
- Tree partnerships with Nassau County planting/maintenance or to encourage more tree planting in county rights-of-way and at boat ramps. County roadways often have large, barren road shoulders. If the city agreed to plant and establish trees on county property, a few biological deserts could be converted into an oasis. Potential planting areas may include Jasmine Street, Citrona Drive, Will Hardee Road, Susan Drive, Simmons Road, North and South 14th Street, Amelia Island Parkway, and Crane Island Drive.

RECENT TREE PLANTING EVENTS (68 trees in 2020 and 142 since 2018)

DATE	# Trees	Event Details
5/1/2018	3	Live oaks for Central Park for National Arbor Day
11/16/2018	4	Live oaks in ROW across from City Hall on Ash Street, placed by business
1/18/2019	25	Florida Arbor Day railroad buffer at S 3 rd and Elm (cedar & wax myrtle)
4/26/2019	4	National Arbor Day at Peck - 4 live oaks
8/2/2019	1	Class Reunion at Peck Center - 1 live oak
12/9/2019	6	Live oaks at Central Park, going above and beyond to offset new solar field
12/17/2019	1	Palm transplanted from Waterfront to Central Park
12/18/2019	1	Keep Nassau Beautiful - 1 live oak at Central Park
1/17/2020	32	Florida Arbor Day - 32 trees at MLK Park
2/21/2020	20	Emma Love tree planting with students (oak, poplar, magnolia, redbud)
2/21/2020	3	Citizen allowed 3 pine seedlings to be planted on private property
4/24/2020	1	Junior Women's Club - 1 Bottlebrush in 2 nd Street ROW across from City Hall
4/30/2020	2	Keep Nassau Beautiful - 2 magnolias at park beside City Hall Park
4/30/2020	2	Keep Nassau Beautiful - 2 live oaks at Egans Park

TREE MAINTENANCE

Routine tree maintenance is conducted on City trees for safety, clearance, and long-term reliability. Removing dead wood, reducing/removing certain branches, or total tree removal will be considered on a case by case basis. The City Arborist is available to assist any department with tree care.



APPENDICIES

Available on City Website at www.fbfl.us/trees

Diversity of Tree Canopy (Aggregated 2009 and 2017 Inventories)

2009, 2019 Canopy Coverage analysis

Relative Age Distribution of Tree Species

Public Trees Condition assessment

2009 Tree Management Plan

2018 Tree Inventory Update

i-tree reports (current condition of canopy) and value

Latimer, Fremont, Urban Forest Planning: A revised process using technology and concept development to develop structure and function, March 2010

SOURCES

Edwards, A. R. (2005). *The Sustainability Revolution*. Gabriola Island: New Society Publishers.

Geiger, J., & King, D. H. (2004). *The Large Tree Argument: The Case for Large Stature Trees vs. Small Stature Trees*. Retrieved October 3, 2009, from Center for Urban Forest Research:
http://www.fs.fed.us/psw/programs/cufr/research/studies_detail.php?ProjID=136

Harris, W., & Dines, N. T. (1998). *Time Saver Standards for Landscape Architects*. New York: McGraw Hill Publishing Company.

Lyle, J. T. (1985). *Design for Human Ecosystems*. New York: Van Nostrand Reinhold.

Matheny, N. P., & Clark, J. R. (1993). *Evaluation of Hazard Trees in Urban Areas*. Champaign: International Society of Arboriculture.

Matheny, N. P., & Clark, J. R. (2008). *Municipal Specialist Certification Study Guide*. Champaign: International Society of Arboriculture.

Nelson, G. (2003). *Florida's Best Native Landscape Plants*. Gainesville: University Press of Florida.
Recommended On-Line Resources:

International Society of Arboriculture: The professional accrediting agency for arboriculture. The site contains general information, links to research and construction details
website: www.isa-arbor.com

Center for Urban Forest Research: A branch of the U.S. Forest service. They conduct a wide variety of research on the performance of trees.
website: <http://www.fs.fed.us/psw/programs/cufr/>

University of Florida: Landscape Plants: Contains a wide variety of resources regarding plant care, selection, design, maintenance standards, storm management and species profiles.
website: <http://hort.ifas.ufl.edu/woody/>

Monrovia Nurseries: An excellent resource for selecting plant material
website: <http://www.monrovia.com/>

i-tree: A database program that helps analyze tree inventories for both value and composition
website: www.itreetools.org