Tree Protection in Developments
BoCC Workshop

Jeff Hays, AICP
Jessica Hong, ISA Certified Arborist
January 7, 2024

Board Direction

- **6/11/2024:** Ask that staff work with the applicant to identify ways in which we could have protected more trees and provide input and feedback to the board with regard to ways we could change code to increase tree protections within the urban services boundary. (Parker Road Cottages Preliminary Development Plan)

- **8/8/2024 BoCC Workshop**

Board Direction - August 8, 2024 Motion

1. Refer to staff for any recommendations to preserve the urban tree canopy.

2. Bring back a recommendation on how staff would prioritize the hierarchy of trees.

3. Refer to staff to bring back some recommendations on dripline impacts that are allowable without mitigation funds

4. Refer to staff bring back recommendations of what other counties and cities are doing for following up on the monitoring and different time frames.

5. Refer to staff to bring back a budget and timeline of doing a tree inventory within the urban cluster by the budget cycle.

Consultant Meetings

Key Takeaways -

- Mitigation payment requirements required for any impact are counterproductive to saving additional trees.
- Open Space locational criteria should be revised.
- Sites are not constructed the same as they used to be – increased grading.
- Examples provided of trees that have survived with impacts.
- Alachua County is unique in tree preservation requirements (Both percentage of initial canopy and individual tree requirements).

Hierarchy of Trees – Current Code

Motion: Bring back a recommendation on how staff would prioritize the hierarchy of trees.

Sec. 406.12(a)(3): In determining the minimum required canopy, priority given to preserving native trees that exhibit a **combination** of the following characteristics **in the following order**:

a. Location within a CMA required for preservation
b. Are high quality champion, heritage, and specimen trees.
c. Help to create, provide or extend connectivity or linkages to other natural areas in the form of tree and vegetation corridors.
d. Exist in natural groupings.
e. Complement the project design including enhancement of the architecture, landscape architecture, streetscape appearance.
f. Are located in required buffer areas.
g. Screen unpleasant views or augment desirable views.
h. Provide shade to structures, areas, or activities within…the development

Hierarchy of Trees – Proposed

Sec. 406.12(a)(3): In determining the minimum required canopy, priority shall be given to preserving native trees that exhibit ~~a **combination** of~~ the following characteristics **in the following order**:

a. High-quality 60-inch (rated 4 and above) specimen trees

b. Are high quality champion, heritage, and specimen trees rated 4 and above.

c. Location within a CMA required for preservation *(Moved down from a.)*

d. Exist in natural groupings to create qualifying Open Space areas or to help to create~~, provide or extend~~ connectivity ~~or linkages~~ to other natural areas. ~~in the form of tree and vegetation corridors.~~

~~e. Exist in natural groupings.~~

~~f. Complement the project design, such as including enhancement of the architecture, landscape architecture, streetscape appearance.~~

g. Are located in required buffer areas.

h. In absence of above, complement project design such as enhancement of streetscape appearance

~~i. Screen unpleasant views or augment desirable views.~~

~~j. Provide shade to structures, areas, or activities within…the development~~

Hierarchy of Trees – Proposed (Clean Version)

Sec. 406.12(a)(3): In determining the minimum required canopy, priority shall be given to preserving native trees that exhibit the following characteristics **in the following order**:

a. High-quality 60-inch (rated 4 and above) specimen trees
b. Are high quality champion, heritage, and specimen trees rated 4 and above.
c. Location within a CMA required for preservation
d. Exist in natural groupings to create qualifying Open Space areas or to help to create connectivity to other natural areas.
e. Are located in required buffer areas.
f. In absence of above, complement project design such as enhancement of streetscape appearance.

Current Tree Code – Protected Area

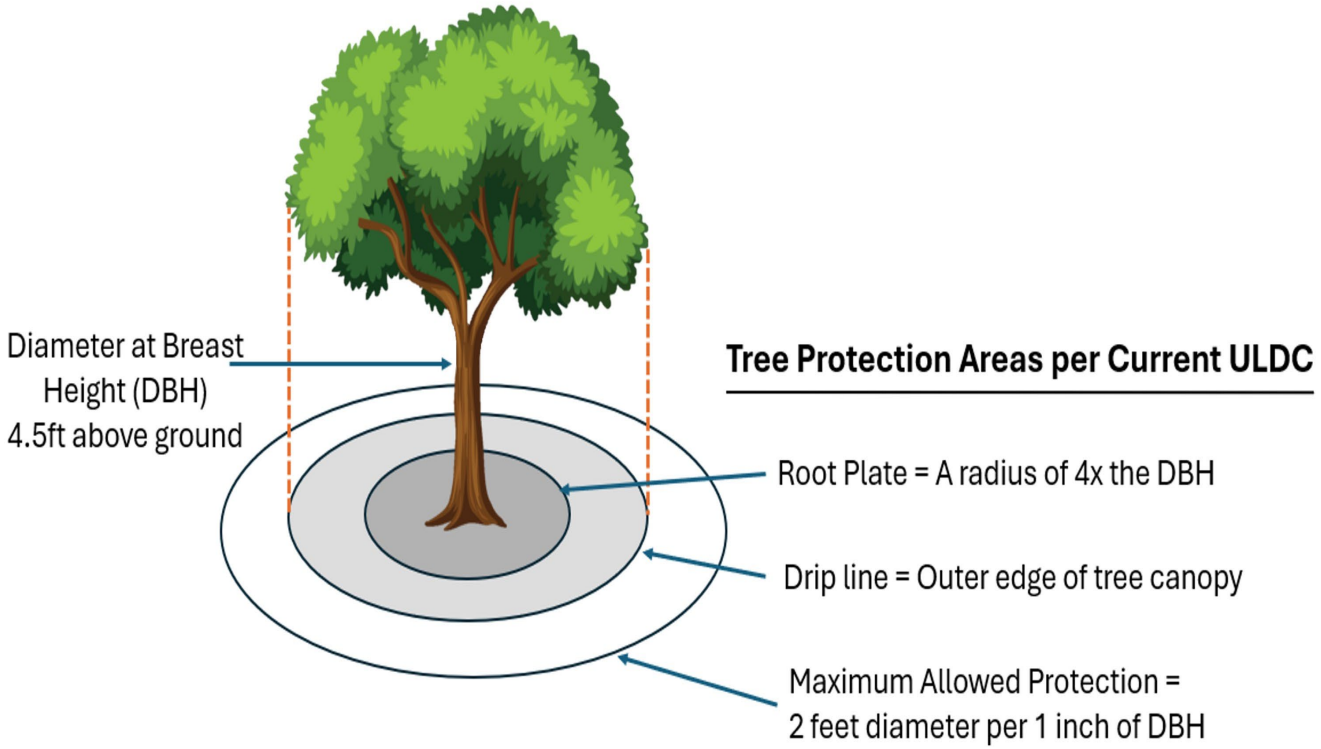
Sec. 406.12.5 (c):

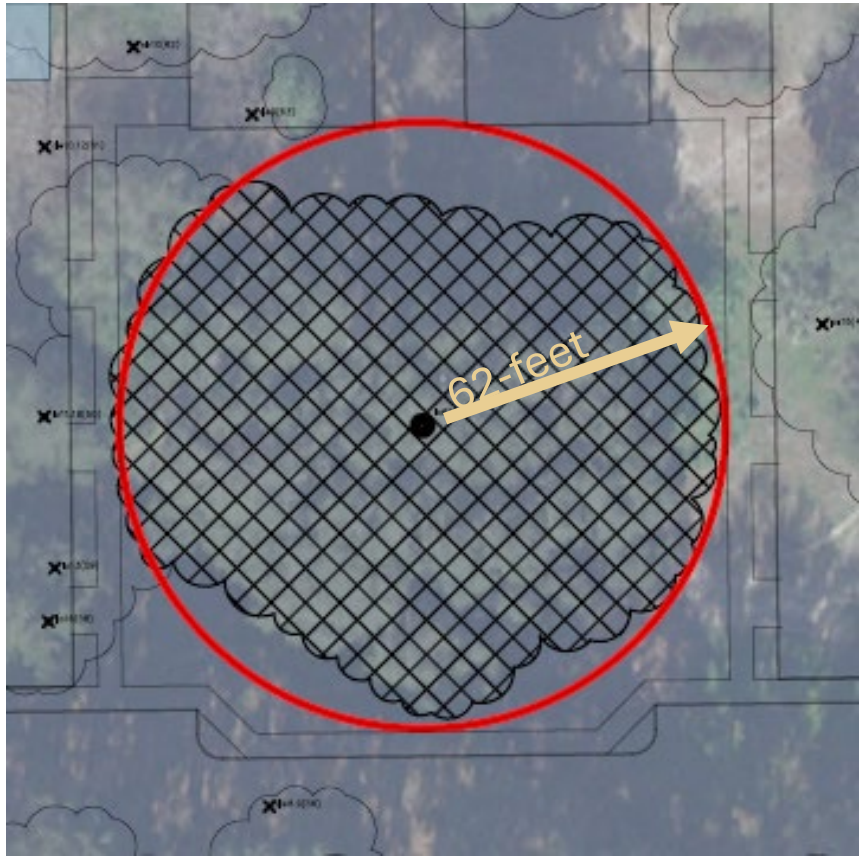
- Protected area equal to drip line of the tree unless larger area is more appropriate
- May be up to two (2) feet diameter of protection for every inch of tree trunk diameter

Image Source: Penn State Extension *Guide To Preserving Trees in Development Projects*

Current Tree Code – Protected Area

Example: A 62-inch tree could require up to 124 feet protected area (62 ft. radius from the tree)





Current Tree Code – Protected Area

406.12 (a)(4)

- Retaining more than the minimum is encouraged
- The undisturbed area may be reduced with County approval (50% max) – for trees beyond the minimum required.
- No development activity within the root plate (4x diameter of tree trunk)

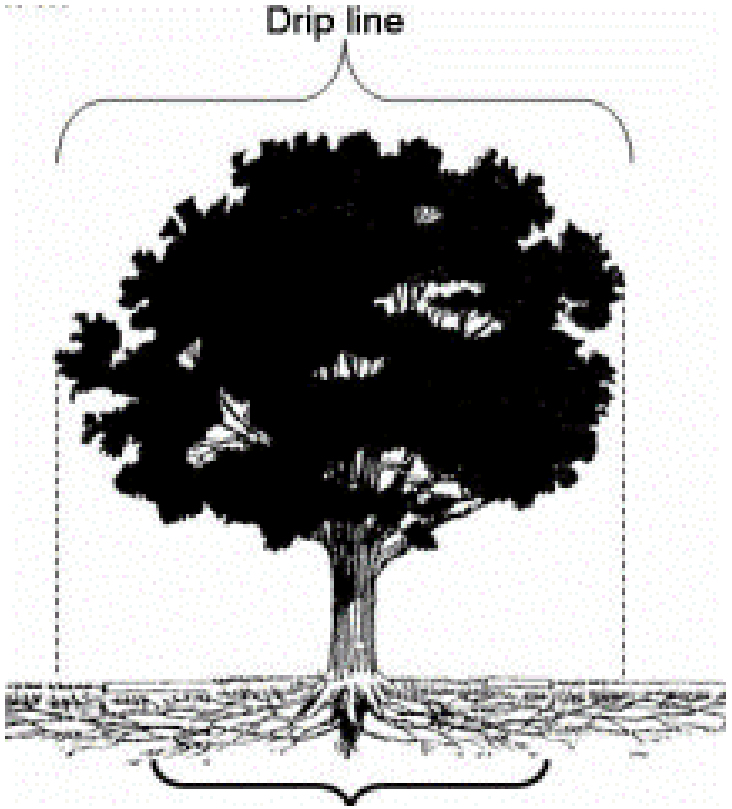
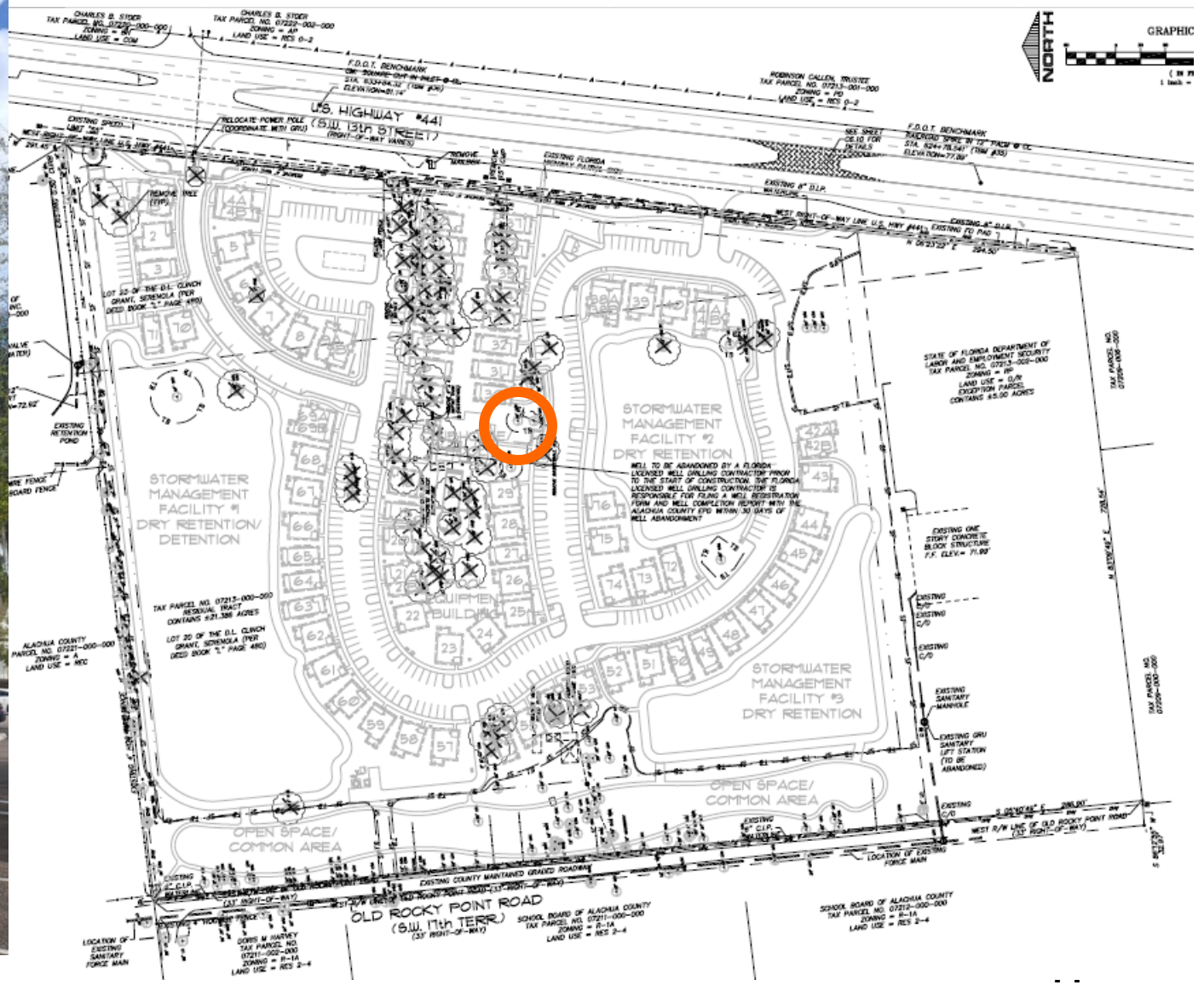


Image Source: Georgia Forestry Comm.

Site Visits and Research – Cottage Grove



Site Visits and Research – Haile Publix

Site Visits and Research – Springhill's Publix

Other Jurisdictions – Code Summary

Motion: Refer to staff bring back recommendations of what other counties and cities are doing for following up on the monitoring and different time frames.

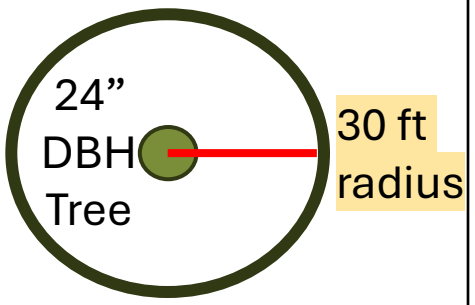
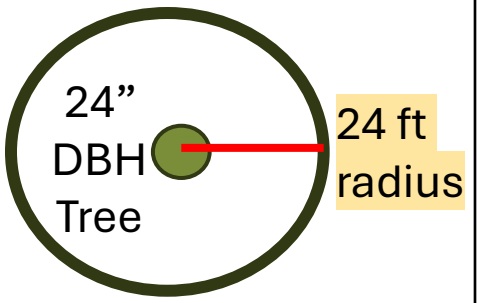
Dripline Impacts – Staff Recommendation

Motion: Refer to staff to bring back some recommendations on dripline impacts that are allowable without mitigation funds

Staff Recommendations:

- Define and standardize concept of a Tree Protection Zone
- Allow impacts up to the root plate
- Provide “Tiers” of impact allowed with associated management, care and mitigation

Comparisons Between Municipalities

Protected Area Terms	Alachua County (Current)	City of Gainesville	Tallahassee	Alachua County (Proposed)	Literature
Root Plate	**x4** (24in DBH = 8ft root plate) ((24in x 4)/12= 8ft	**x4** (24in DBH = 8ft root plate) ((24in x 4)/12 = 8ft)	**Not defined**	**No Change**	**x6** **distance from trunk for root pruning** – ISA Root Pruning BMP (2023)
• **Tree Protection Zone** • **Dripline** • **Critical Root Zone**	**Dripline** (not defined in code) – • Minimum is outer edge of canopy from aerial • Max 1ft for 1 inch DBH for radius or 2ft per 1in for diameter	**Dripline** – outer edge of canopy or 1.25 ft for 1 inch DBH of diameter, whichever is greater 	**Critical Root Zone** – 1ft for every inch of diameter 24” tree= 24 ft radius	**Tree Protection Zone** – 1ft for every 1inch of DBH for radius or dripline, whichever is greater 	**Diameter Method** – 1ft for every 1inch of DBH up to 1.5 ft for every 1 inch (Trees and Construction)* **Multiplier Method -** A number (6-18) is multiplied to the diameter based on Species Tolerance, Maturity, and Condition

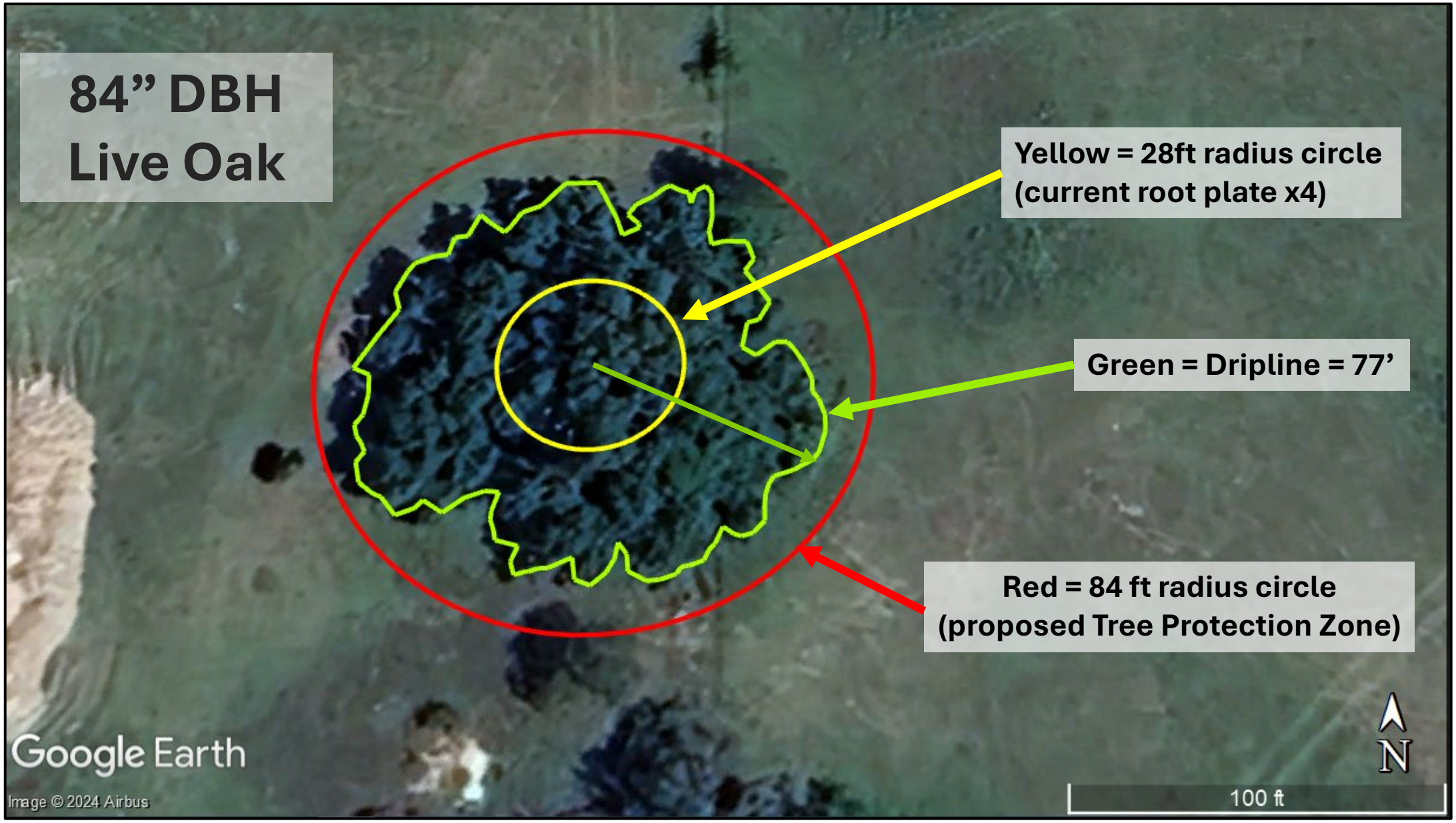
Comparisons between Municipalities (cont'd)

Protected Area	Alachua County (Current)	City of Gainesville	Tallahassee	Alachua County (Proposed)
Impacts	• No dripline impacts for minimum percentage canopy retained • Beyond the minimum retained, impacts of up to 50% within the dripline can be made with 50% mitigation • No root plate impacts	• Dripline (as defined) • 2/3rd within dripline • Up to root plate	Generally, no construction activity within Critical Root Zone (CRZ). There are exceptions allowed in CRZ with required mitigation techniques/management.	A tiered approach of areas impacts with required management techniques. No root plate impacts may be allowed. • 0-25% • 26-50% • 51-75%

Dripline Impacts – Staff Recommendation

Areas of Impact	Management Techniques Required	Mitigation Plantings/Fee-in-Lieu
Up to 25% of the calculated TPZ	No	No
26-50% of the calculated TPZ	Yes	No
51-75% of the calculated TPZ	Yes	Yes – reduced

Current vs Proposed Tree Protection Areas



Other Jurisdictions - Monitoring

Gainesville:

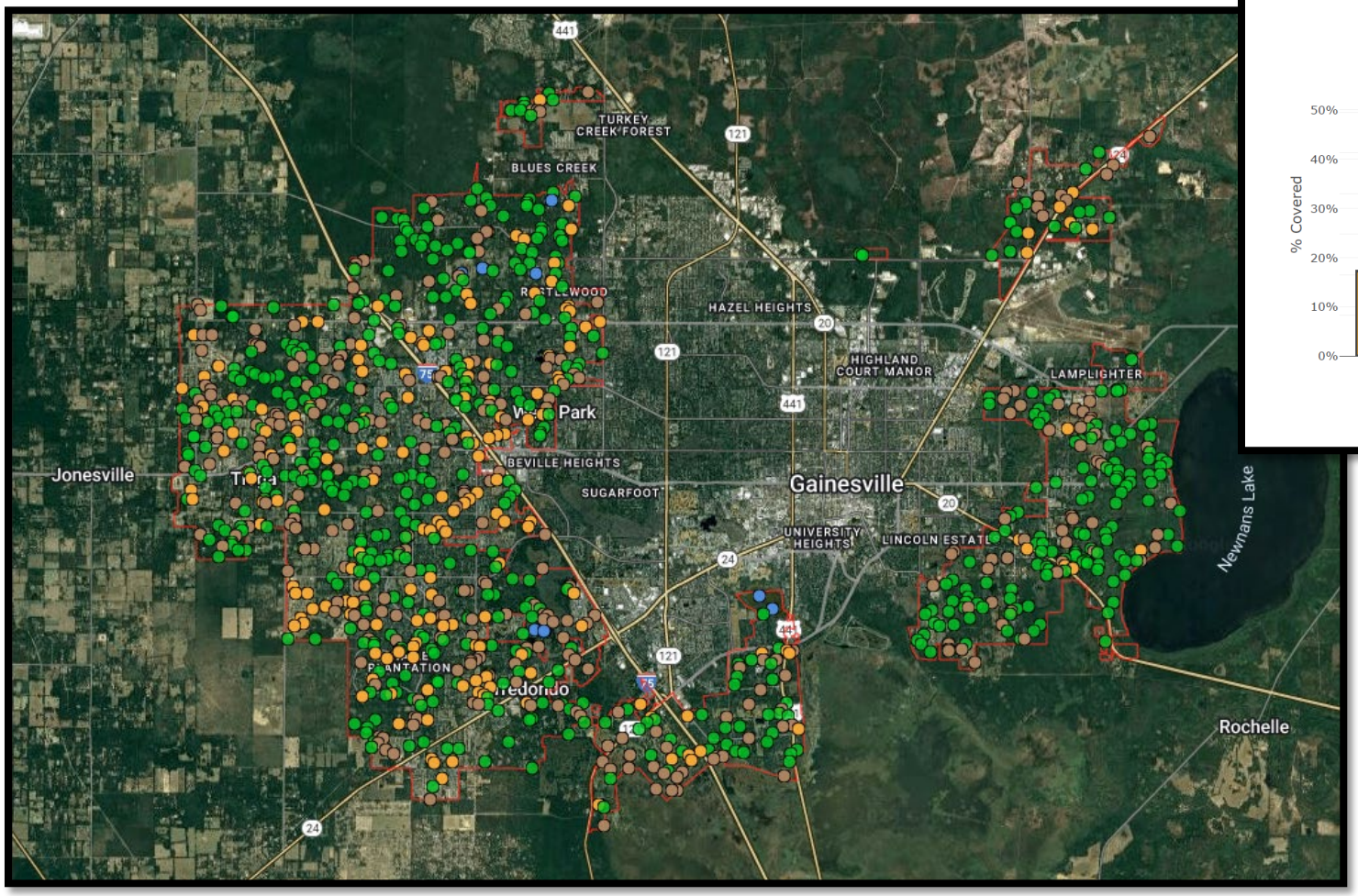
- If any preserved tree is not alive and healthy three years after the certificate of occupancy is granted, it shall be removed and replaced with the tree or trees which originally would have been required by this code. The area that was preserved to accommodate the preserved tree shall be maintained in an unpaved condition and the replacement trees established in this area.

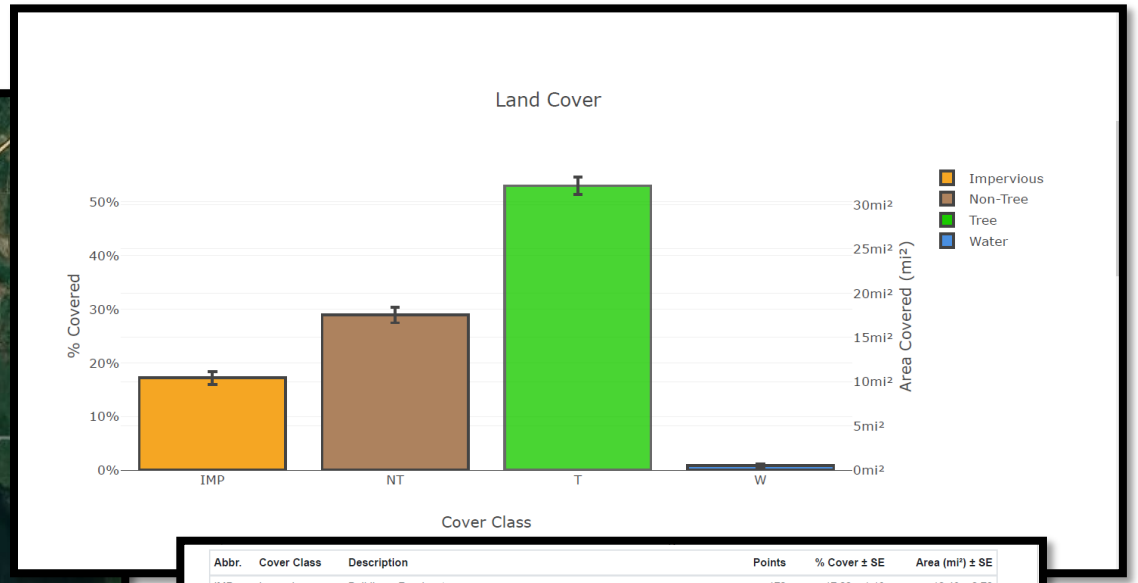
Tallahassee:

Outlines methods before and during construction to help with long-term help of tree.

- Site monitoring code – all tree protection procedures (watering, mulching, root pruning, fertilization, soil aeration) shall be monitored through the construction period by L.A or Arborist.

Tree Inventory/Urban Forest Master Plan





Abbr.	Cover Class	Description	Points	% Cover ± SE	Area (mi²) ± SE
IMP	Impervious	Buildings, Roads, etc.	172	17.20 ± 1.19	10.43 ± 0.72
NT	Non-Tree	bare ground	289	28.90 ± 1.43	17.52 ± 0.87
T	Tree	Tree, non-shrub	530	53.00 ± 1.58	32.14 ± 0.96
W	Water	Water/Wetland	9	0.90 ± 0.30	0.55 ± 0.18
Total			**1000**	**100.00**	**60.63**

Tree Benefit Estimates: Carbon (English units)

Description	Carbon (kT)	±SE	CO_2 Equiv. (kT)	±SE	Value (USD)	±SE
Sequestered annually in trees	28.07	±0.84	102.94	±3.07	$4,788,125	±142,586
Stored in trees (Note: this benefit is not an annual rate)	705.06	±21.00	2,585.20	±76.98	$120,247,775	±3,580,866

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Amount sequestered is based on 0.874 kT of Carbon, or 3.203 kT of CO_2, per mi²/yr and rounded. Amount stored is based on 21.940 kT of Carbon, or 80.446 kT of CO_2, per mi² and rounded. Value (USD) is based on $170,550.73/kT of Carbon, or $46,513.84/kT of CO_2 and rounded. (English units: kT = kilotons (1,000 tons), mi² = square miles)

Tree Benefit Estimates: Air Pollution (English units)

Abbr.	Description	Amount (T)	±SE	Value (USD)	±SE
CO	Carbon Monoxide removed annually	9.81	±0.29	$13,968	±416
NO2	Nitrogen Dioxide removed annually	38.78	±1.15	$6,100	±182
O3	Ozone removed annually	467.39	±13.92	$272,617	±8,118
SO2	Sulfur Dioxide removed annually	83.67	±2.49	$910	±27
PM2.5	Particulate Matter less than 2.5 microns removed annually	24.40	±0.73	$573,921	±17,091
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	187.42	±5.58	$1,266,934	±37,728
Total		**811.47**	**±24.16**	**$2,134,450**	**±63,562**

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Air Pollution Estimates are based on these values in T/mi²/yr @ $/T/yr and rounded:

Tree Inventory/Urban Forest Master Plan – Budget and Timeline

- Some preliminary staff effort to date and discussion during Climate Action Plan
- Different scopes for different levels of urban forest analysis
- Necessary ranges from $110,000 - $600,000
- Grants are available and we do currently have $84,000 settlement from GREC that could be used as a local matching funds.
- Scope Elements would include:
  - Project Planning
  - Remote Sensing Analysis of Tree Canopy Analysis
  - Field Work and Ground Truthing
  - Policy Development regarding total canopy in 20 years, tree retention, tree planting and tree mitigation

Recommended Updates

- Amend Comp Plan for Open Space location criteria
- Codify tree rating system
- Update hierarchy of tree protection
- Update Tree protection standards and impact allowances
- Exempt Rural-ag up to 9 lots & Family Homestead Subdivisions requirements
- Code Enforcement and Penalty section
- Applicability exemption date for existing PDPs

References

- Matheny, N, Smiley, E.T., Gilpin, R., & Hauer, R. (2023). Managing Trees During Site Development and Construction: Best Management Practices. International Society of Arboriculture(ISA).

- Matheny, N & Clark, J.R. (1998). Trees and Development: A Technical Guide to Preservation of Trees During Land Development. International Society of Arboriculture (ISA).

- Costello, L., Watson, G., Smiley, E.T., & Hauer, R. (2023). Best Practices for Root Pruning: Continuing Education Unit. International Society of Arboriculture (ISA).

Questions and Discussion