

Risk Assessment & Tree Inventory at UKY

UK Facilities- Grounds

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ISA TRAQ 2023-28

ASCA TPAQ 2019-2024

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Presentation Agenda

- ▶ Introduction
- ▶ Tree Inventory
 - ▶ Need for tree inventory
 - ▶ Data collection
 - ▶ How we use our inventory
- ▶ Tree Risk
 - ▶ obligation/requirement
 - ▶ Assessment tools
 - ▶ Assessment type & intervals

UK Campus Arboriculture

Campus Tree Care Plan

Protect existing trees, train young trees, provide soil volume for new trees

Policies, Procedures, BMP's

TreeCampus USA

TreeCampus HealthCare

Tree Protection Standards

Planting Standards

Pruning Standards

Tree Canopy Analysis

Storm Water Credit

Plant Health Care Program

Collaborate with students and faculty

Wood Salvage (Logs to Lumber)

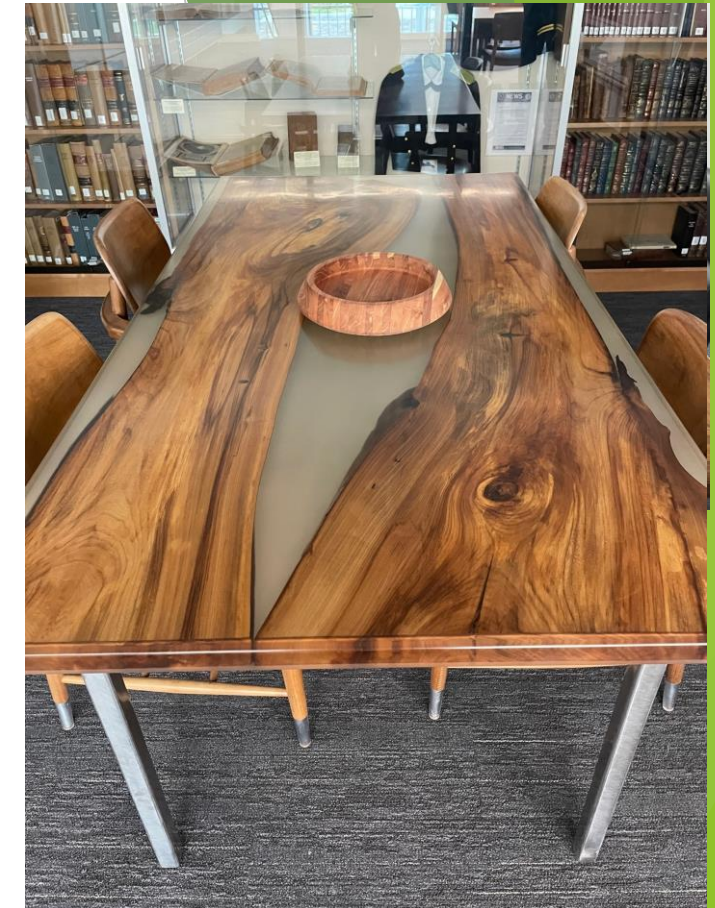
Training

Facilities Staff

Students

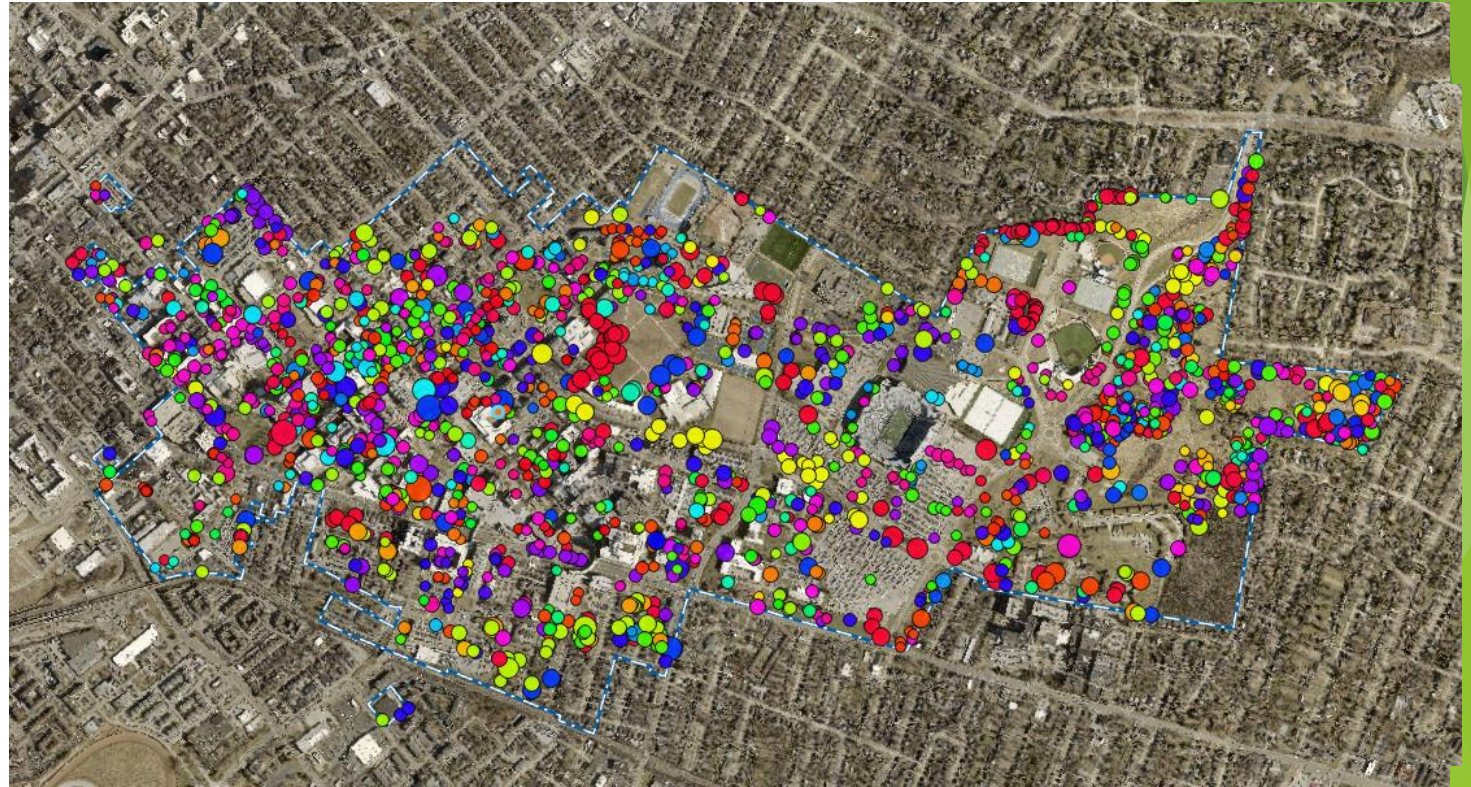
Industry Professionals

General Public



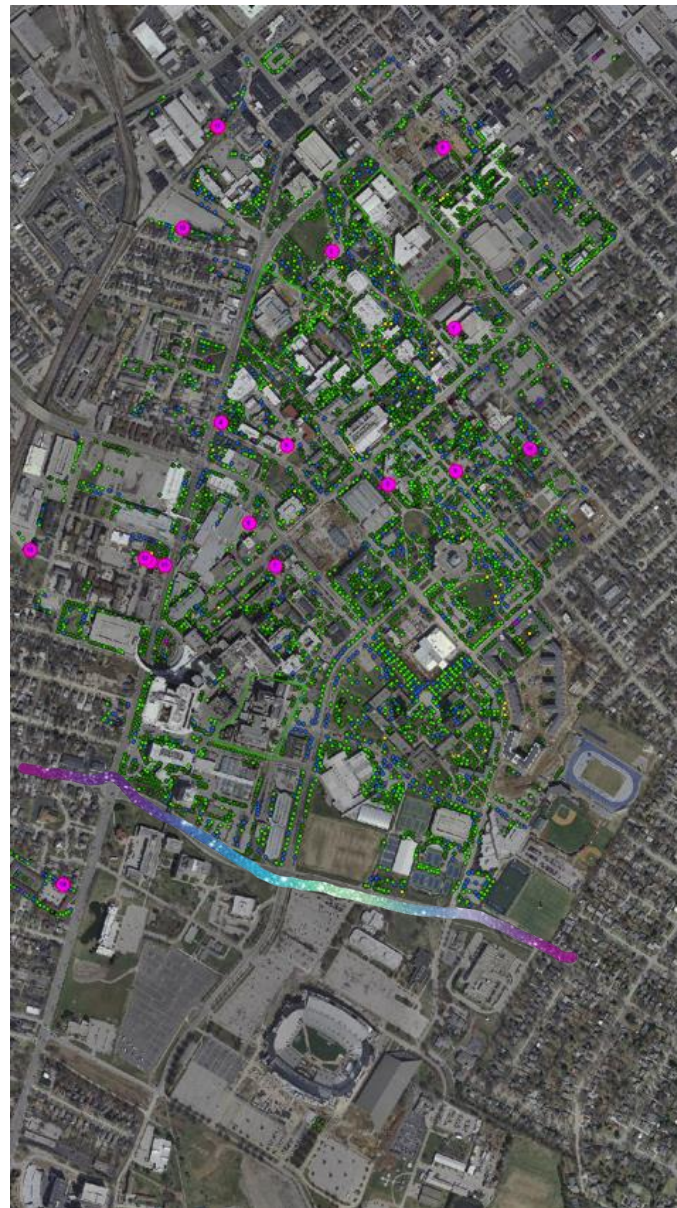
UK Tree Inventory

- Need to know what you have
 - Approximately 13k(+/-) trees on 900 (+/-) acres
- 76 Genera
- 528 species/cultivars
- Canopy cover- 14% (2022 data)



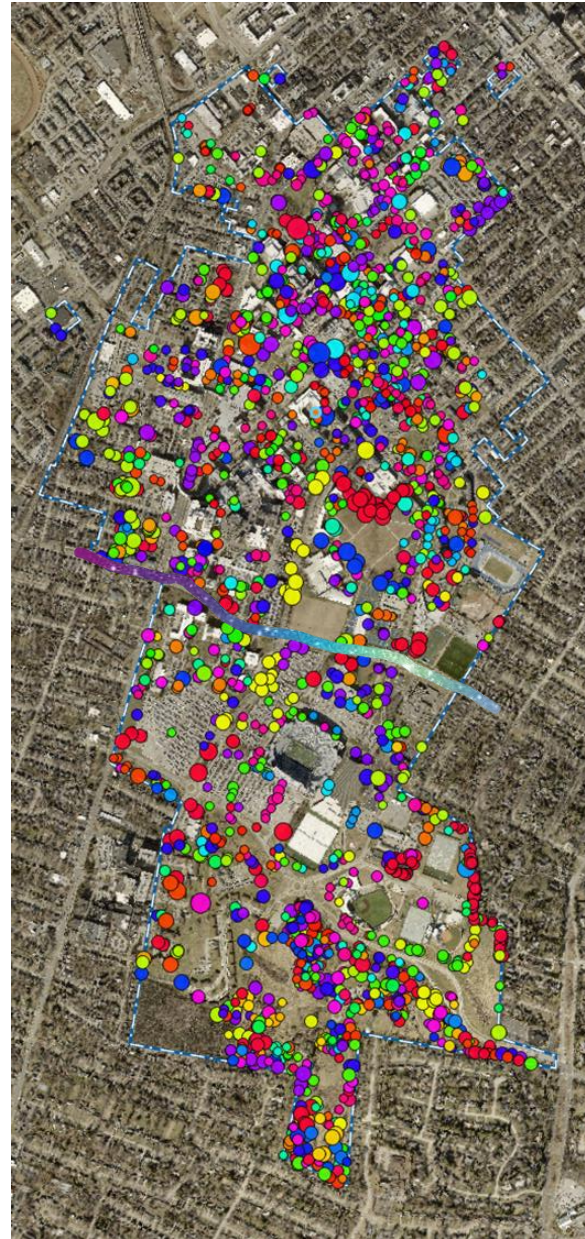
UK Tree Inventory

- Started with Arbor Pro in 2012
- Paid to have them inventory approximately ½ of campus
- Pros and Cons
 - Cost
 - Regional knowledge
 - Time



UK Tree Inventory

- Migrated to TreePlotter in 2018
- Student employees and students helped advance inventory data collection



UK Tree Inventory

Why we moved inventory platforms

➤ Features

- Unlimited users
- Work Order Management
- Tree Risk Assessment
- Tree Protection
- Appraisal
- Eco Benefits

The screenshot displays the 'TREE DETAILS - 2814' window in the Treeplotter Inventory application. The interface includes a navigation bar with 'HUB', 'DATA', and 'SUPPORT' options, and a top menu with 'REQUEST', 'ADD', 'MOVE', and 'LOG OUT'. The main content area is divided into several tabs: 'PLANT', 'LOCATION', 'MANAGEMENT', 'HTHC', '10TH APPRAISAL', and 'WORK RECORDS'. The '10TH APPRAISAL' tab is active, showing an 'Appraisal Values Calculation' section. Below this, there are tabs for 'SPECIES RATING', 'CONDITION RATING', and 'LOCATION RATING', with 'FINAL APPRAISAL' selected. The final appraisal value is prominently displayed as \$62,300. A table titled 'Details' provides a breakdown of the appraisal calculation, showing the formula $Appraisal\ Value = BTC * SR * CR * LR$ and the values for each component: Tree Diameter (64 in.), Replacement Tree Size (2.00 in.), Trunk Area of Replacement (3.14 in.²), and Replacement Tree Cost (\$250.00). A pop-up window on the right side of the screen shows details for 'Tree 2814', including its common name (Field Elm), Latin name (Ulmus minor), condition (Fair), DBH (64), and risk rating (Low). The background of the interface is an aerial map with various trees marked by colored dots.

Final Appraisal
\$62,300

Details			
Appraisal Value = BTC * SR * CR * LR			
D	Tree Diameter	Diameter of tree to be appraised (from Tree Info tab)	64 in.
d	Replacement Tree Size (diameter)	Diameter of the largest commonly available transplantable tree (see Regional Information)	2.00 in.
T _R	Trunk Area of Replacement	$0.785 * d^2$	3.14 in. ²
RTC	Replacement Tree Cost	See Regional Information to use cost selected.	\$ 250.00

Tree 2814

Tree	
Common Name	Field Elm
Latin Name	Ulmus minor
Condition	Fair
DBH	64
Risk Rating	Low

UK Tree Inventory

Informs tree selection for future plantings

Most Common Genus - Top 10

PIE BAR TABULAR



Quercus	27.1%
Acer	18.5%
Pinus	12.3%
Magnolia	8.3%
Cornus	8.1%
Celtis	6.4%
Malus	5.4%
Prunus	4.8%
Ulmus	4.7%
Gleditsia	4.4%

Most Common Species - Top 10

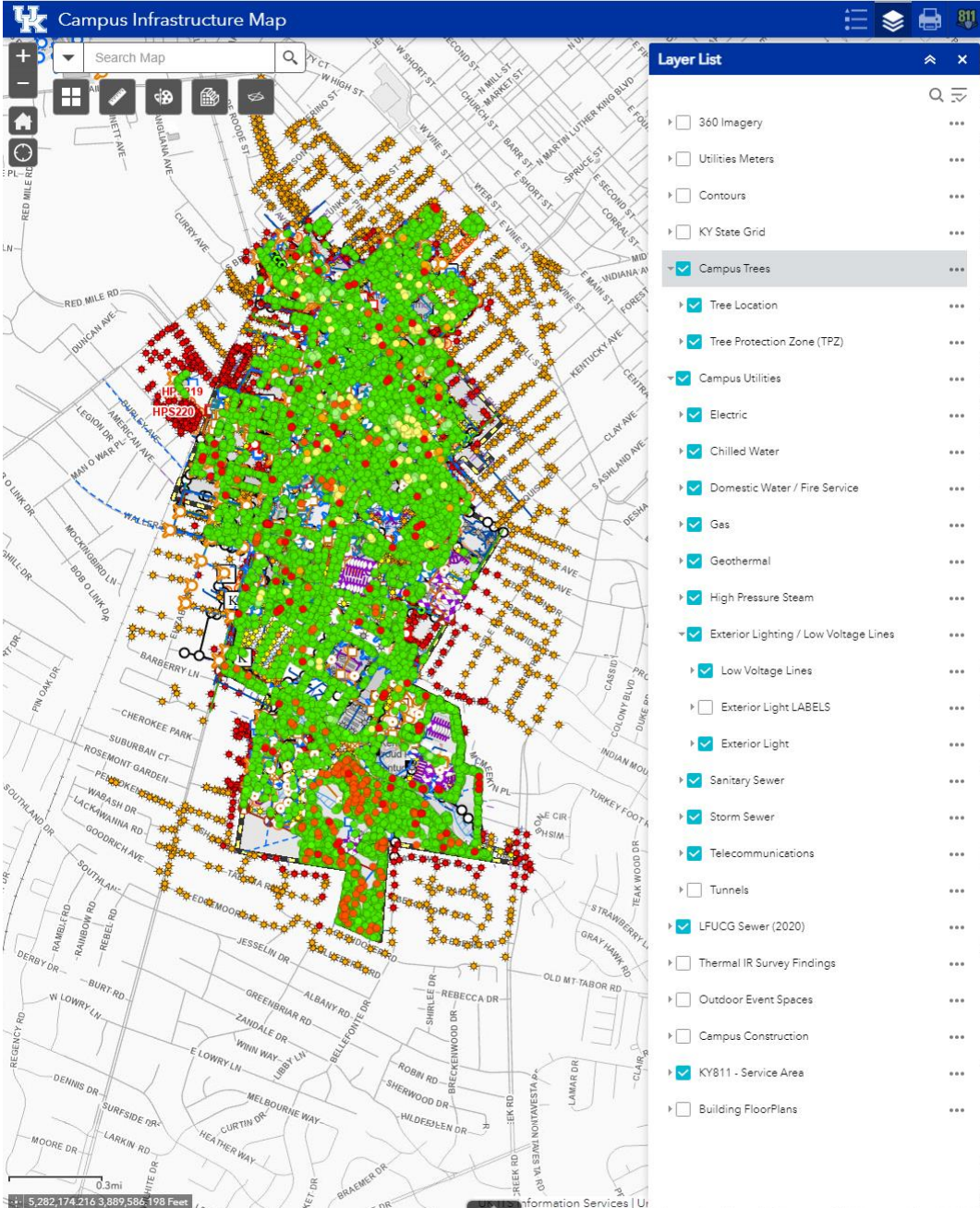
PIE BAR TABULAR



White Pine	16.5%
Common H...	11.4%
Red Maple	11.0%
Sugar Maple	10.7%
Willow Oak	9.7%
Sweetbay ...	9.7%
Crabapple	8.4%
Red Oak	8.3%
Eastern R...	7.5%
Shademast...	6.8%

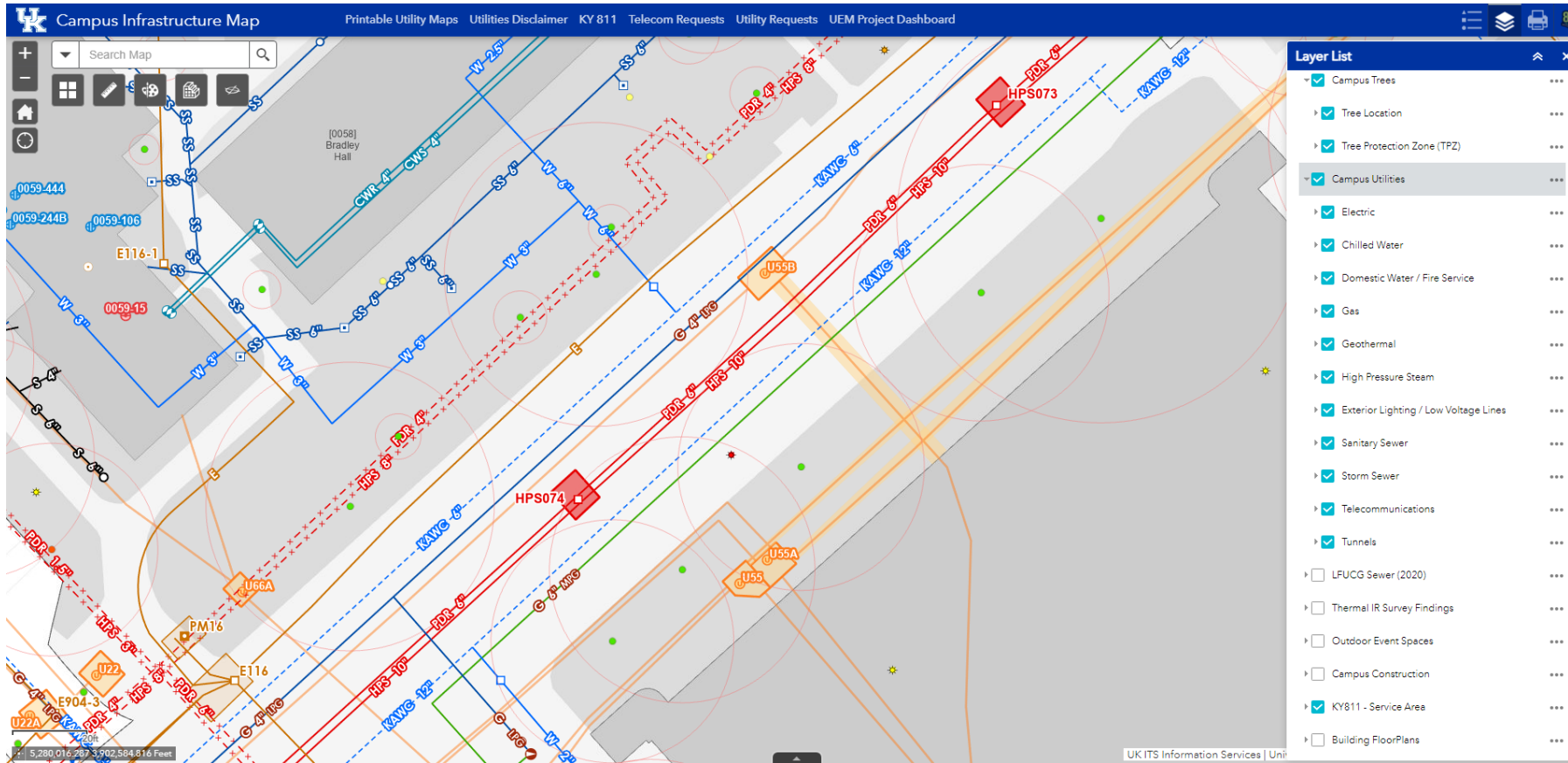
UK Tree Inventory

Utilities map integration



UK Tree Inventory

Utilities map integration

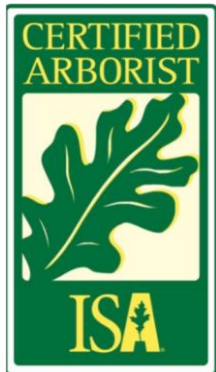


Tree Risk Assessment

The right side of the slide features a decorative graphic composed of several overlapping, semi-transparent green triangles and polygons. The colors range from a light, pale green to a dark, forest green. The shapes are arranged in a way that creates a sense of depth and movement, resembling a stylized tree or a cluster of leaves. The overall effect is modern and clean, complementing the title.

Tree Risk Assessment

- ▶ As tree managers we have a duty of care
 - ▶ To assess our trees and their risk potential
 - ▶ To mitigate risk
- ▶ We have seven ISA Certified Arborist in Grounds
 - ▶ Three have TRAQ
 - ▶ One is a BCMA
 - ▶ One is a RCA



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Tree Risk Assessment

- ▶ The tree inventory is the first tool to begin assessing risk
- ▶ Perform tree risk assessment

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

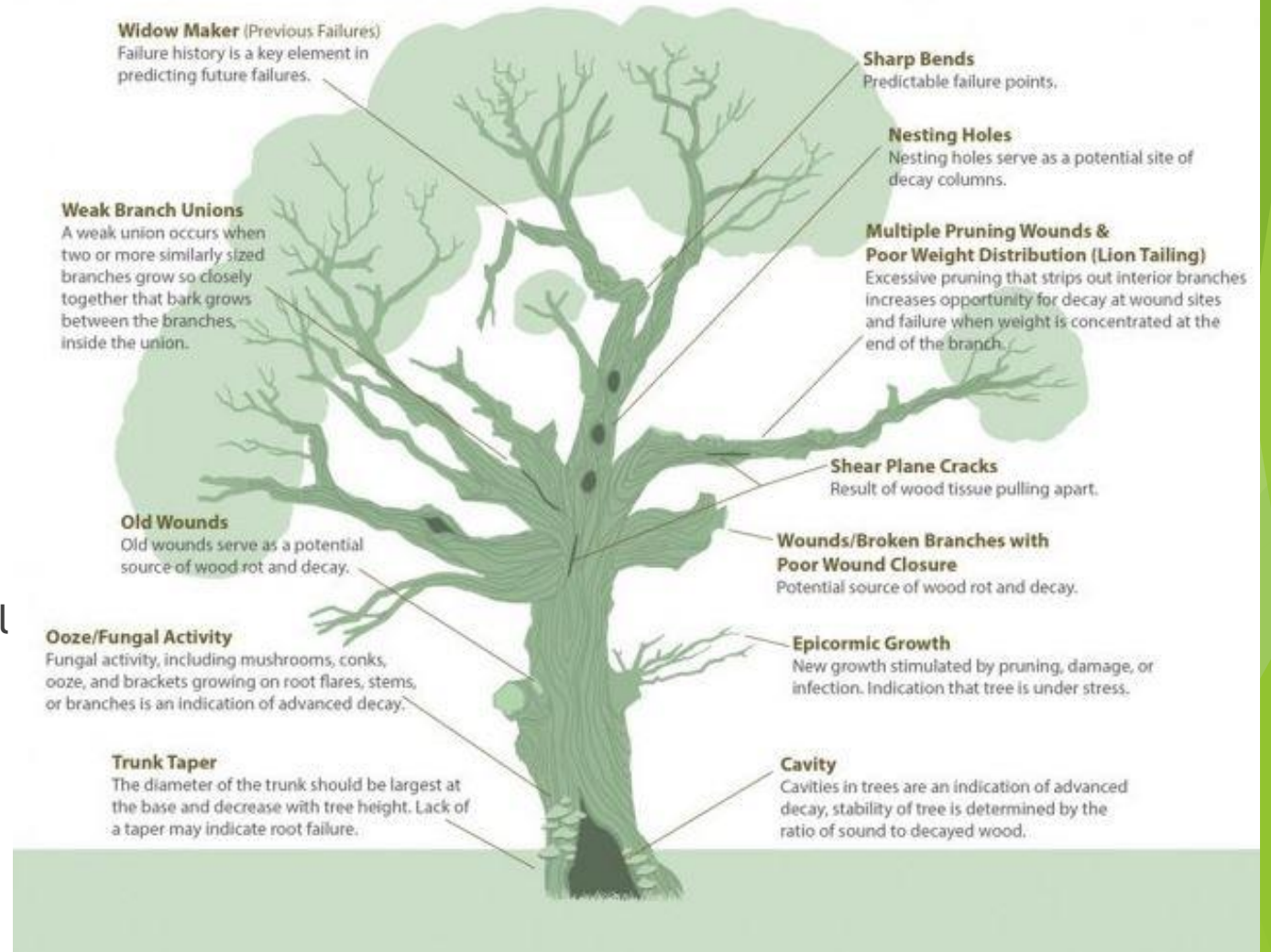
Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

(Source: ISA 2018)

Tree Risk Assessment

- ▶ Is there a target?
- ▶ Dead branches or limbs
- ▶ Broken / Hanging branches or limbs
- ▶ Dead, Loose, Missing bark
- ▶ Mushrooms, Shelf fungi
 - ▶ On the trunk, limbs, branches
 - ▶ On the roots
 - ▶ Around the base of the tree in the soil
- ▶ Decay
- ▶ Cavities
- ▶ Root loss
- ▶ Heaving or sunken soil
- ▶ History of failure

Hazard Tree Identification



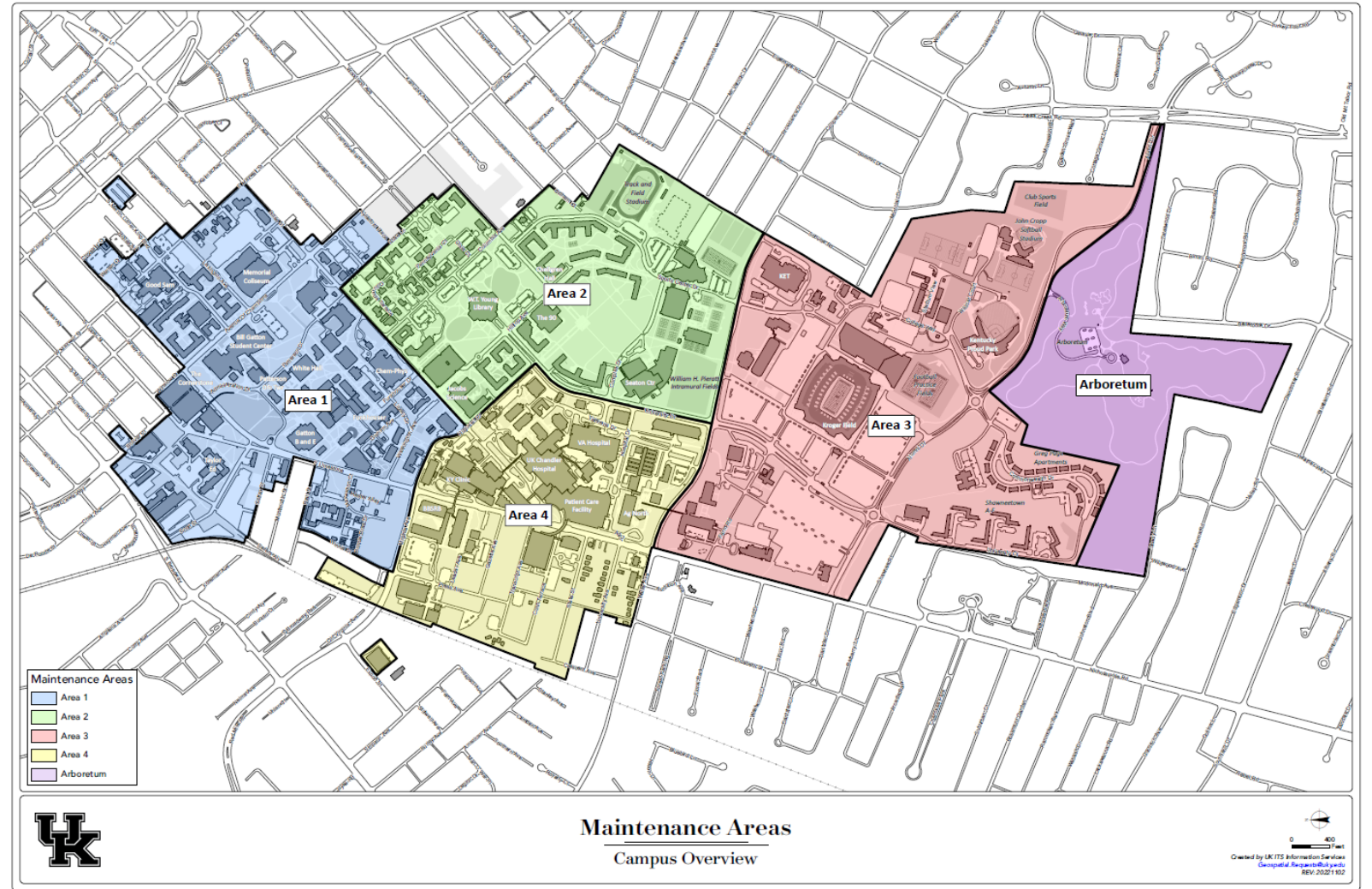
Tree Risk Assessment

Levels of Risk Assessment

- Level 1- windshield survey
- Level 2- 360 degree walk around, simple tools
- Level 3- Aerial inspection, advanced diagnostic tools

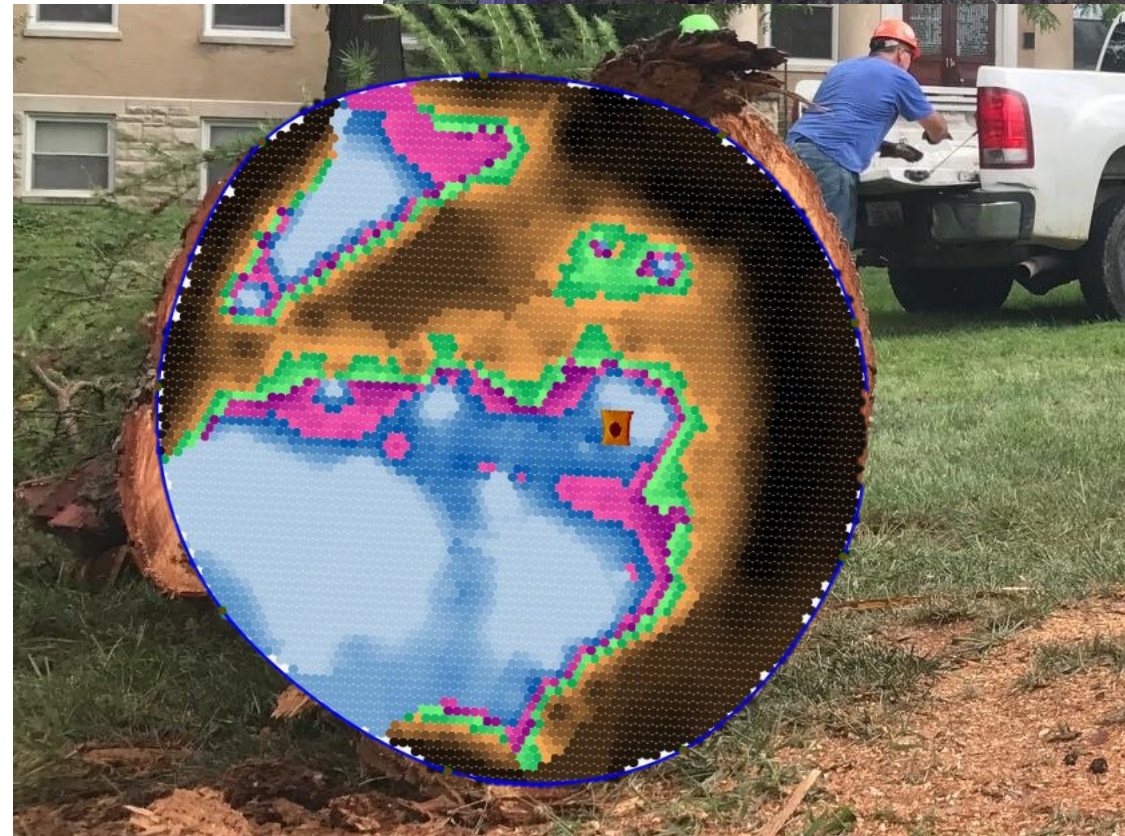
Intervals

- Weekly-Level 1
- Quarterly- Level 1
- After storms-Level 1 & 2
- Level 3 inspections as needed



Tree Risk Assessment Diagnostic Tools

- ▶ Mallet (resonance sounding)
- ▶ Binoculars
- ▶ Camera
- ▶ Probe
- ▶ Diameter tape
- ▶ Hypsometer or clinometer
- ▶ IML Resistograph
- ▶ PiCUS 3 Sonic Tomography



Tree Risk Assessment



Managing Risk

- ▶ In-house arborist team of 3 with a superintendent to oversee program
- ▶ 89 ft. aerial lift
- ▶ Contracted Arborists



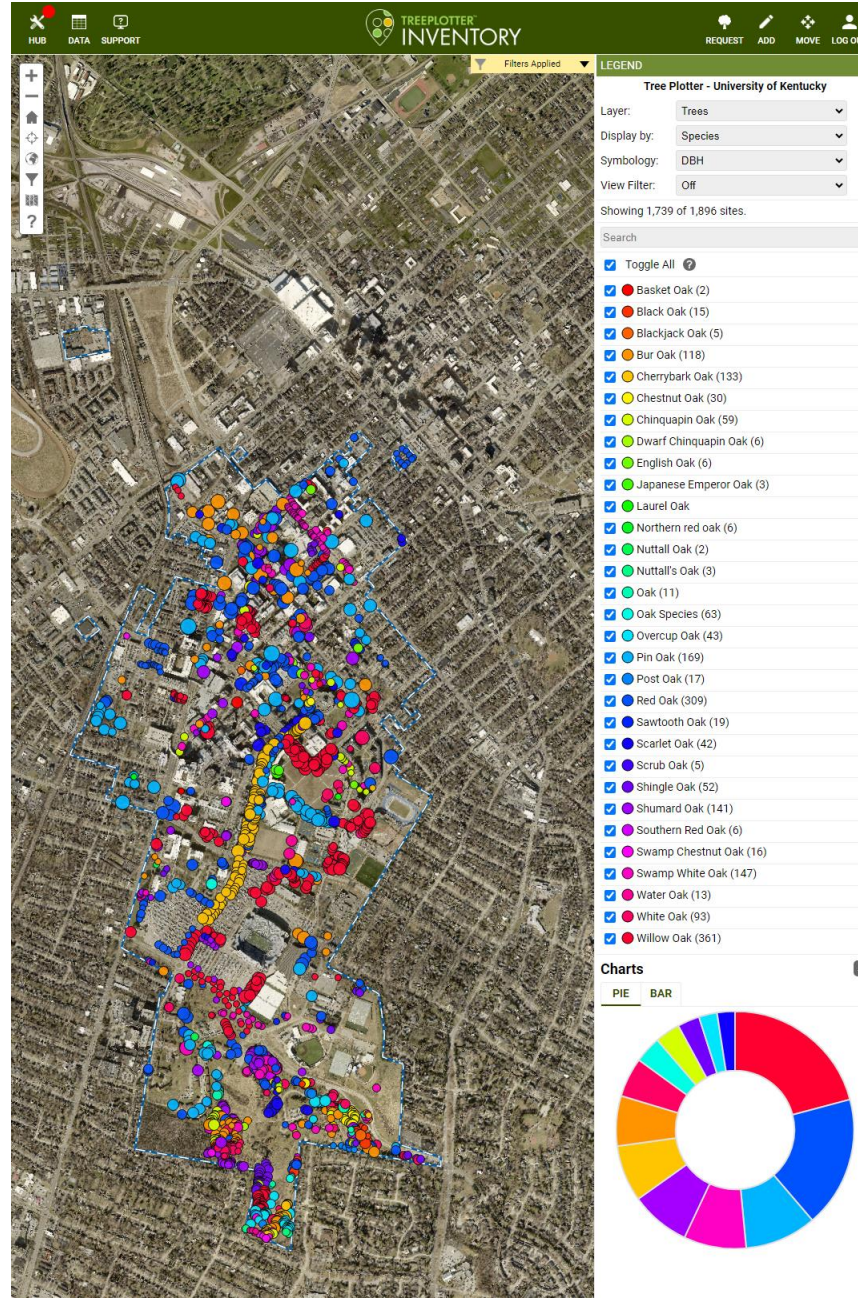
Risk to Trees

- ▶ From Lightning
 - ▶ Install Lightning Protection System
- ▶ Pests & Diseases
 - ▶ Keep trees vigorous and stress free
 - ▶ Apply pesticides preventatively



Risk to Trees

- ▶ Emerald Ash Borer
 - ▶ 290 Ash trees
- ▶ Asian Long Horn Borer
 - ▶ 2,766 host trees
- ▶ Oak diseases
 - ▶ 1,895 oaks (1,203 'red'- 692 'white')



Questions & Discussion

Thank you,
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