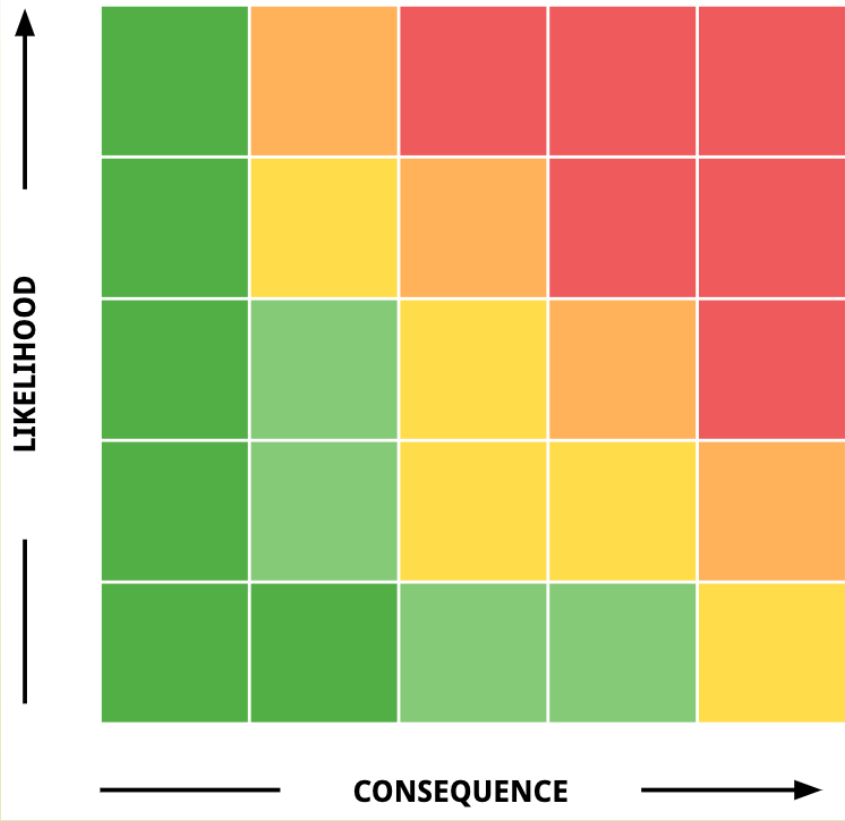
Introduction to Tree Risk Management

Steve Lane – Urban Forestry Consultant

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

What is Risk as it Relates to Trees?

- **The likelihood of a tree or tree part failing**
- **Combined with the likelihood of that failure affecting a target**
- **And the severity of the associated consequences (personal injury, property damage or disruption of services)**



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

What is Tree Risk Management?

The application of policies, procedures and practices to identify, evaluate, mitigate, monitor and communicate tree risk.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Are Trees in Urban Settings More Likely to Fail?

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

What are my responsibilities?

Isn’t a tree or branch falling known as an “Act of God”?

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Act of God Definition:

"An accident or event resulting from natural causes, without human intervention or agency, and one that could not have been prevented by reasonable foresight or care—for example, floods, lightning, earthquake, or storms."

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

The Tree Owner: Living With Risk

- There is no 100% “safe” tree. All trees pose some degree of risk
- Even the safest most structurally sound tree can fail during extreme weather
- It is up to the Tree Owner, NOT the practitioner to decide what level of risk they are willing to live with
- Clearly, we need to inform the client, but they need to make the decisions, and that needs to be clearly spelled out

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Mitigation Recommendations

- For the practitioner, we have to provide options for mitigating risk
- We do NOT have to recommend which option we think is best
- Sometimes a recommendation is clear and present, other times not
- Be aware of potential liability for a written recommendation
- “But you told me not to remove it, and it crushed my car!”. Yup. Bad call.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

The Public: Different Mindsets

- The general public tends to have a different view of trees and nature
- More of a “Bob Ross” mindset: Happy Little Trees!
- Do not understand the risk that trees can pose until it is often too late
- Aesthetics of tree overtake safety concerns
- Tree Risk Assessment process can be “bad press”

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

How do we Manage Tree Risk?

Create a Tree Risk Management Policy

Identify potential tree risk in the urban forest

Conduct higher levels of risk assessment on individual trees where appropriate

Identify and prioritize risk mitigation actions

Develop management plan

Implement plan

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Why do we manage risk?

LIABILITY

“CYA”

IT’S THE RIGHT THING TO DO

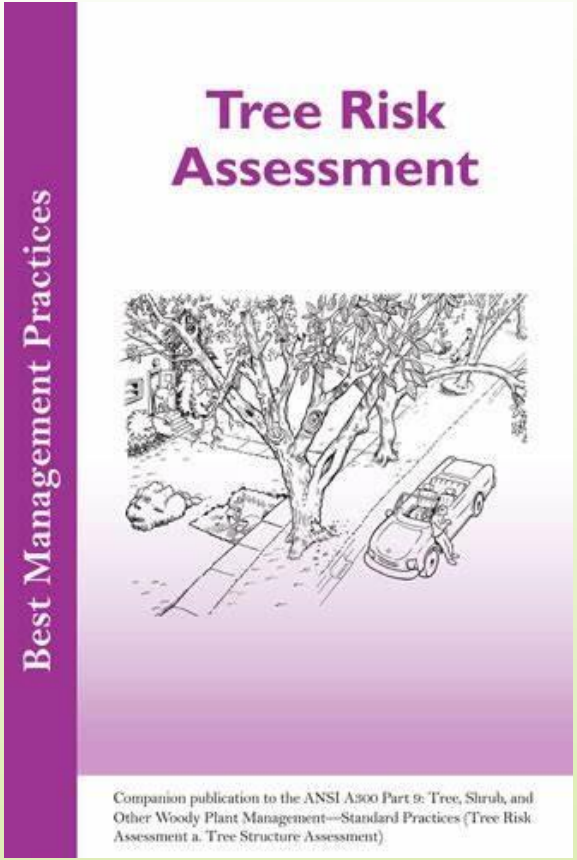
Tree Risk Management Objective

- Balance *the risks* that trees may pose with *the benefits* that a municipality derives from those trees.
- Impossible to maintain trees free of risk. *Any tree can fail* under excess loads.
- To properly manage risk, managers must have a basic knowledge of the *potential risks to people and property*.
- Fortunately, serious injury and death from tree failure is relatively uncommon, and in a municipal setting you have a degree of Tort Immunity.

Identifying Tree Risk – How?

The **ISA** has a **BMP** called **TRAQ**

- ISA = International Society of Arboriculture
- BMP = Best Management Practice
- TRAQ = Tree Risk Assessment Qualification



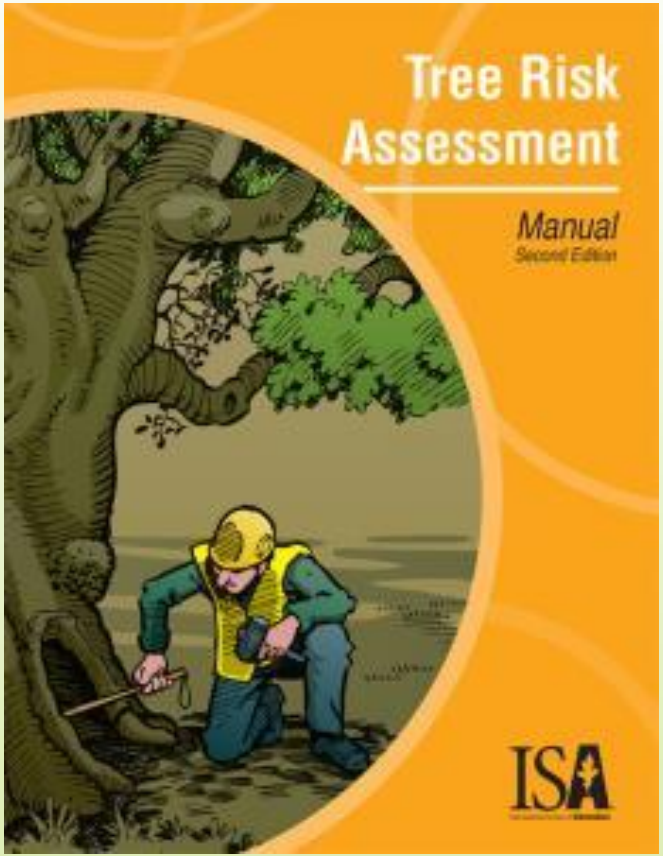
GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Tree Risk Assessment

Tree Risk Assessment is a **systematic process** based on ANSI A300 Part 9 Standards.

This process is used by trained arborists to **identify, analyze and evaluate** tree risk.

Risk is evaluated by categorizing the **likelihood of failure** and the **severity of the consequences** of the failure.



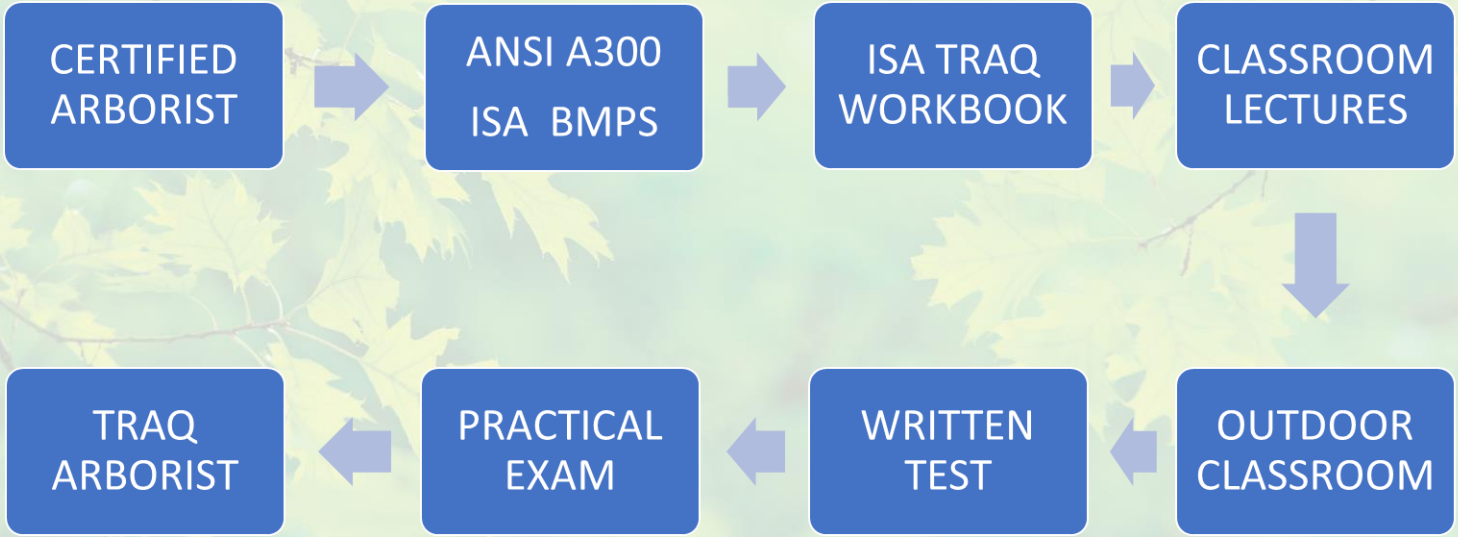
GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Assessment Personnel

Assessments should be conducted by trained ISA Certified Arborists with Tree Risk Assessment Qualifications.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

TRAQ arborists have undergone extensive training and testing by the ISA.



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

How Can My Staff Get TRAQ Trained?

- Illinois Arborist Association (and other state chapters) offers 3 day courses several times a year for full TRAQ Qualification
- Illinois Urban Forest Strike Team Training is available through IAA and US Forest Service which covers field basics of risk assessment (non credential bearing)
- IAA also offers an Advanced Training Course on Risk Assessment which is non-credential bearing.
- ISA has many courses available

IAA ILLINOIS ARBORIST ASSOCIATION

ISA International Society of Arboriculture

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

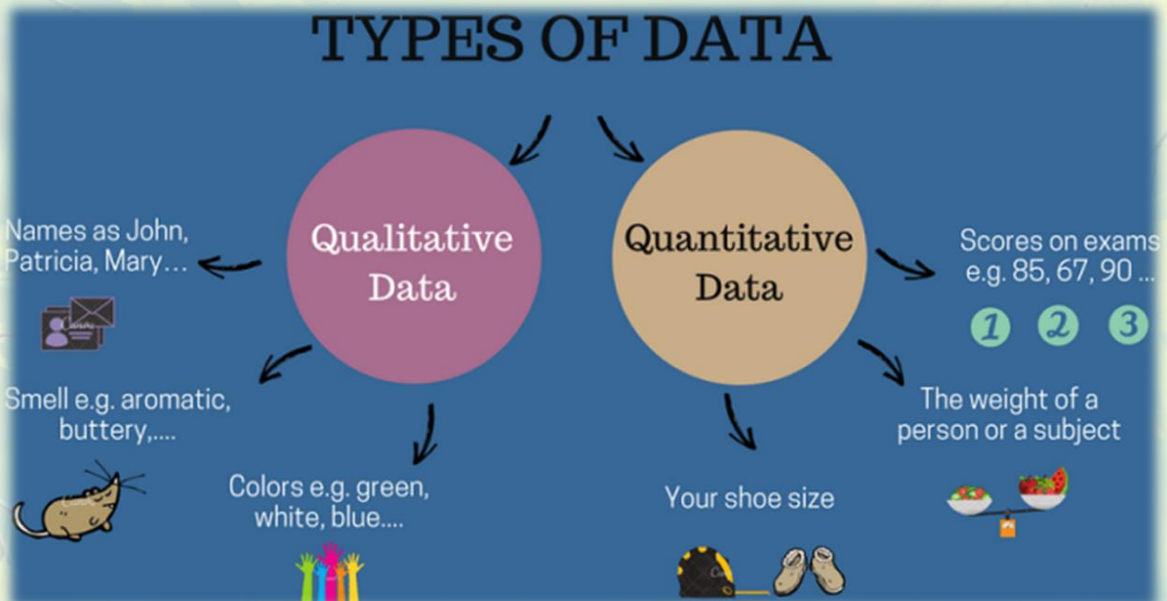
Urban Forest Strike Team

- UFST assists communities, that don't have any forestry resources, to:
  - Provide increased public safety
  - Reduce the loss of community trees
  - Document recovery needs and cost
  - Plant for long-term recovery of a healthy resilient community forest

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

A Qualitative Assessment

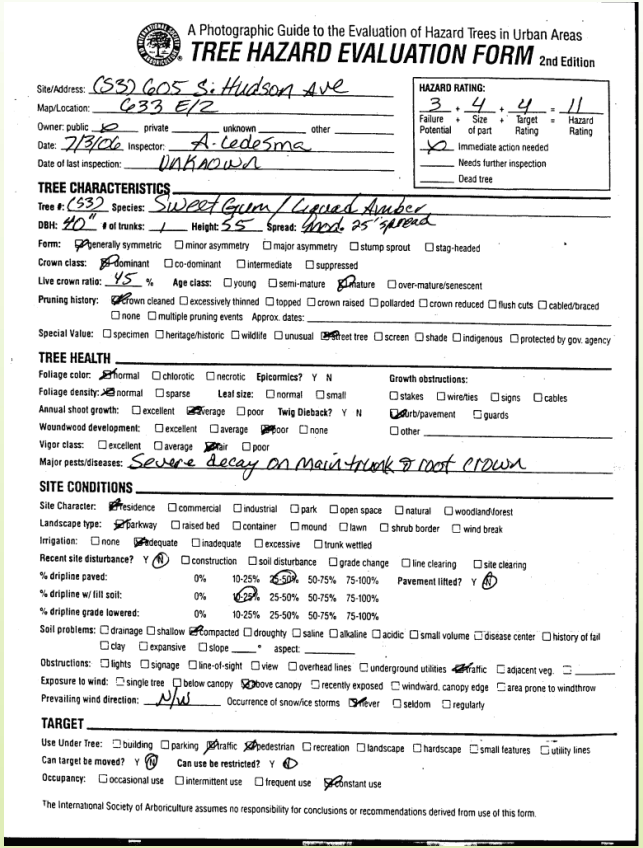
- A TRAQ risk assessment is a qualitative process
- The assessment process does not ensure nor require perfection
- Provides a common language we can all use to identify risk



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Old ISA Hazard Assessment Form

- Quantitative Assessment, not Qualitative
- Each section results in a number, which are then added together to create an overall hazard level from 0-100
- Biggest problem was that small tree parts got de-emphasized (rating of 1)
- Turns out that small parts falling from high distances are the majority of injury and damage claims
- Attorneys and other litigants could more easily escape liability by using the numbers-based system



A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas

TREE HAZARD EVALUATION FORM 2nd Edition

Site/Address: (533) 605 S. Hudson Ave
Map/Location: 633 E/2
Owner: public X private ____ unknown ____ other ____
Date: 2/3/06 Inspector: A. Ledesma
Date of last inspection: UNKNOWN

HAZARD RATING:
3 (Failure Potential) + 4 (Size of part) + 4 (Target Rating) = 11 (Hazard Rating)
X Immediate action needed
____ Needs further inspection
____ Dead tree

TREE CHARACTERISTICS
Tree #: (533) Species: Sweet Gum / Leopard Amber
DBH: 40" # of trunks: 1 Height: 55 Spread: 40+ 25' spread
Form: X generally symmetric ☐ minor asymmetry ☐ major asymmetry ☐ stump sprout ☐ stag-headed
Crown class: X dominant ☐ co-dominant ☐ intermediate ☐ suppressed
Live crown ratio: 45 % Age class: ☐ young ☐ semi-mature X mature ☐ over-mature/senescent
Pruning history: X crown cleaned ☐ excessively thinned ☐ topped ☐ crown raised ☐ pollarded ☐ crown reduced ☐ flush cuts ☐ cabled/braced ☐ none ☐ multiple pruning events Approx. dates: ____
Special Value: ☐ specimen ☐ heritage/historic ☐ wildlife ☐ unusual X street tree ☐ screen ☐ shade ☐ indigenous ☐ protected by gov. agency

TREE HEALTH
Foliage color: X normal ☐ chlorotic ☐ necrotic Epicormics? Y N
Foliage density: X normal ☐ sparse Leaf size: ☐ normal ☐ small
Annual shoot growth: ☐ excellent X average ☐ poor Twig Dieback? Y N
Woundwood development: ☐ excellent ☐ average X poor ☐ none
Vigor class: ☐ excellent ☐ average X fair ☐ poor
Major pests/diseases: Severe decay on main trunk & root crown
Growth obstructions: ☐ stakes ☐ wire/ties ☐ signs ☐ cables X curb/pavement ☐ guards ☐ other ____

SITE CONDITIONS
Site Character: X residence ☐ commercial ☐ industrial ☐ park ☐ open space ☐ natural ☐ woodland/forest
Landscape type: X parkway ☐ raised bed ☐ container ☐ mound ☐ lawn ☐ shrub border ☐ wind break
Irrigation: ☐ none X adequate ☐ inadequate ☐ excessive ☐ trunk wetted
Recent site disturbance? Y (N) ☐ construction ☐ soil disturbance ☐ grade change ☐ line clearing ☐ site clearing
% dripline paved: 0% 10-25% (25-50%) 50-75% 75-100% Pavement lifted? Y (N)
% dripline w/ fill soil: 0% (10-25%) 25-50% 50-75% 75-100%
% dripline grade lowered: 0% 10-25% 25-50% 50-75% 75-100%
Soil problems: ☐ drainage ☐ shallow X compacted ☐ droughty ☐ saline ☐ alkaline ☐ acidic ☐ small volume ☐ disease center ☐ history of fail ☐ clay ☐ expansive ☐ slope ____ ° aspect: ____
Obstructions: ☐ lights ☐ signage ☐ line-of-sight ☐ view ☐ overhead lines ☐ underground utilities X traffic ☐ adjacent veg. ☐ ____
Exposure to wind: ☐ single tree ☐ below canopy X above canopy ☐ recently exposed ☐ windward, canopy edge ☐ area prone to windthrow
Prevailing wind direction: N/W Occurrence of snow/ice storms X never ☐ seldom ☐ regularly

TARGET
Use Under Tree: ☐ building ☐ parking X traffic X pedestrian ☐ recreation ☐ landscape ☐ hardscape ☐ small features ☐ utility lines
Can target be moved? Y (N) Can use be restricted? Y (N)
Occupancy: ☐ occasional use ☐ intermittent use ☐ frequent use X constant use

The International Society of Arboriculture assumes no responsibility for conclusions or recommendations derived from use of this form.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

TRAQ Risk Level Ratings

The advanced assessments determine a Risk Level based on:

The *likelihood of tree failure* (in whole or in part)
The *likelihood of a failure impacting a target*
The *severity of the consequence* of the failure and impact

The intersection of these three points will help us to assign a risk level:

Low ***Moderate*** ***High*** ***Extreme***

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

RISK RATING MATRIX

Likelihood of Tree Failure Impacting Target

Likelihood of Failure	Likelihood of Impacting Target			
	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

Risk Rating Matrix

Likelihood of Failure and Impact	Consequences			
	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

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Likelihood of Failure

Improbable:	Tree or branch is not likely to fail.
Possible :	Failure could occur but is unlikely.
Probable:	Failure may be expected.
Imminent:	Failure has started or is most likely to occur. Get the caution tape out.

These are for “under normal weather conditions.”

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

What is “Normal” Weather?

- “Don’t like the weather in illinois? Wait 5 Minutes and it’ll change”
- “Normal” does not mean a bright sunny spring day with no rain or wind
- Snow, thunderstorms, ice storms, heavy rain, winds up to 30 mph. All NORMAL in our area!
- Getting good long term weather data is the only way to decide if failure was due to normal or abnormal weather conditions

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Good Sources of Weather Data:

- NOAA Weather data access site: https://www.ncdc.noaa.gov/data-access
- Weather Underground History Site: https://www.wunderground.com/history
- Farmer's Almanac Weather Site: https://www.almanac.com/weather/history

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Tree Defect Examples

Dead branches
Hangers
Dead trees
Decay

Cankers
Cracks
Root problems
Weak branch unions

Dead Trees

Dead Limbs and Hangers

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Cracked Trunks and Limbs

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Weak or cracked unions

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Included Bark

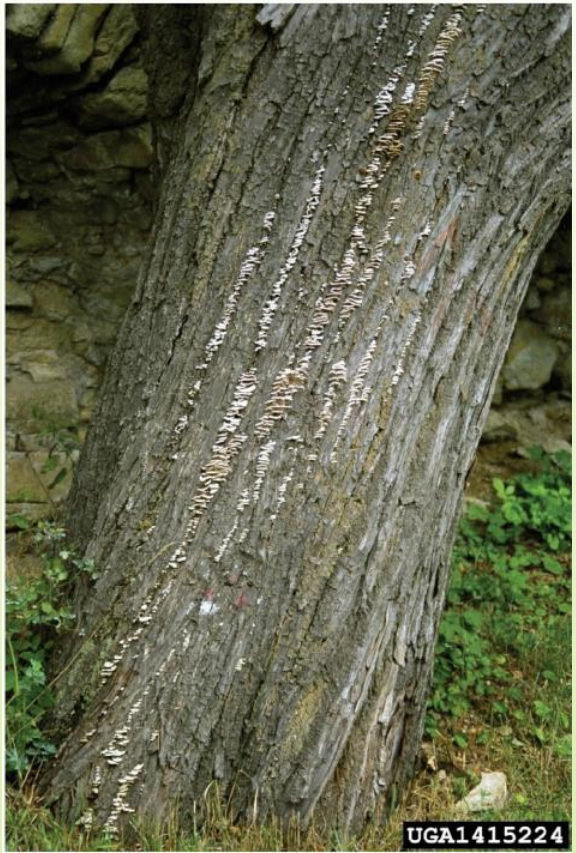
Decay

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Indicators of Decay

GREAT LAKES
URBAN FORESTRY
MANAGEMENT
A GRAF TREE CARE COMPANY

Sapwood Decay



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Basal/Root Decay

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Cankers

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Targets

For there to be *risk*, there must be a *target*, i.e. people or property.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Targets

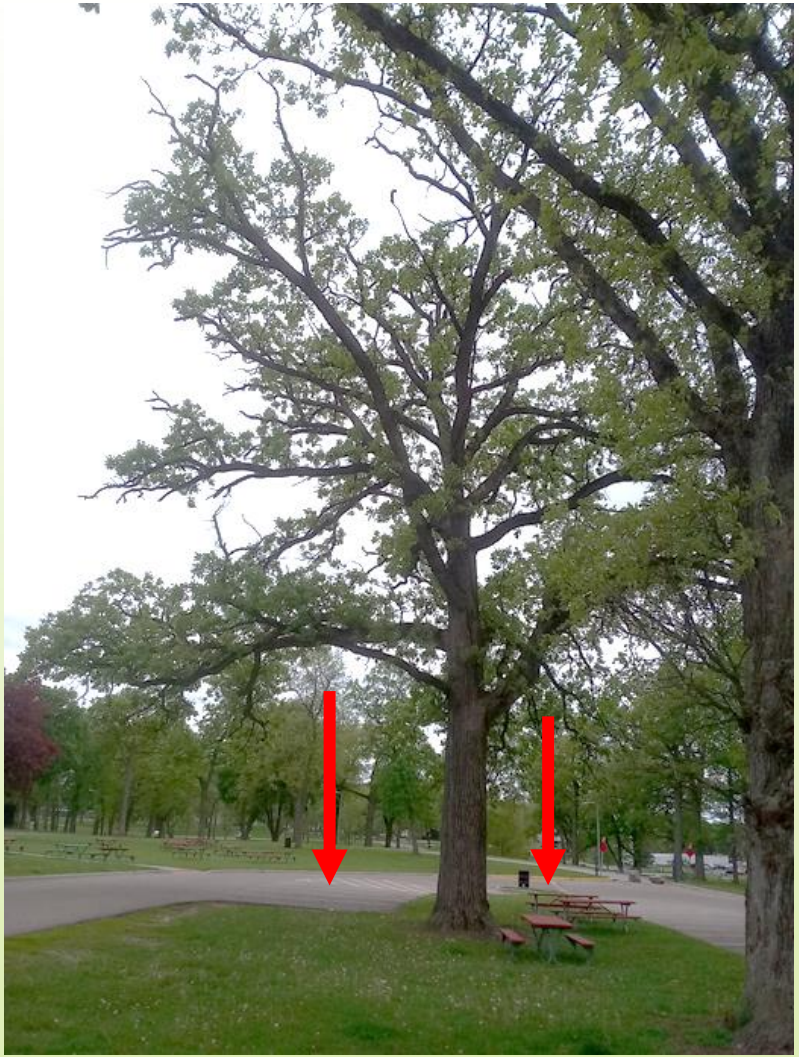
Two types of targets:

Static (unmovable)

Dynamic (moving)

Is it reasonable to move the target?

Or to prevent access to the target zone?



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Target Zones

Determine the “Target Zone”

Area where tree or branch failure is likely to land

Generally, target zone radius is 1 x tree height (1.5 x tree height for dead trees)

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

The Urban Environment: Target-Rich

- The Urban Environment is FILLED with potential targets:
- People
- Large buildings
- Cars
- Utility infrastructure
- Expensive Hardscapes
- Lighting infrastructure
- Fences
- ??????

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Occupancy Rate

Rare	Not commonly used by people
Occasional	Occupied infrequently or irregularly
Frequent	Occupied for a large part of a day or week
Constant	Occupied at all times. 24/7/365

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Occupancy Rates: How Do We Calculate This?

- Occupancy rates can be very difficult to determine
- Have a heavy impact on the overall risk rating of the tree, but for good reason
- How often are people in the failure zone of the tree?
- 24 hour cycles
- Seasonal cycles
- Meteorological cycles

Likelihood of Impact

After carefully considering your targets, target zones and occupancy levels, we rate the likelihood that a failure will impact the target as:

Very Low	Remote chance of impacting the target
Low	Not likely to impact the target
Medium	As likely to impact the target as not
High	Will most likely impact the target

First: Identify potential targets

Likelihood of Impact

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Consequence of Failure

Rate the consequence as:

Negligible	Low value damage, no personal injury
Minor	Low to moderate property damage, minor injury
Significant	Moderate to high value property damage, or personal injury
Severe	Serious personal injury or death, high value property damage

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

RISK RATING MATRIX

Likelihood of Tree Failure Impacting Target

Likelihood of Failure	Likelihood of Impacting Target			
	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

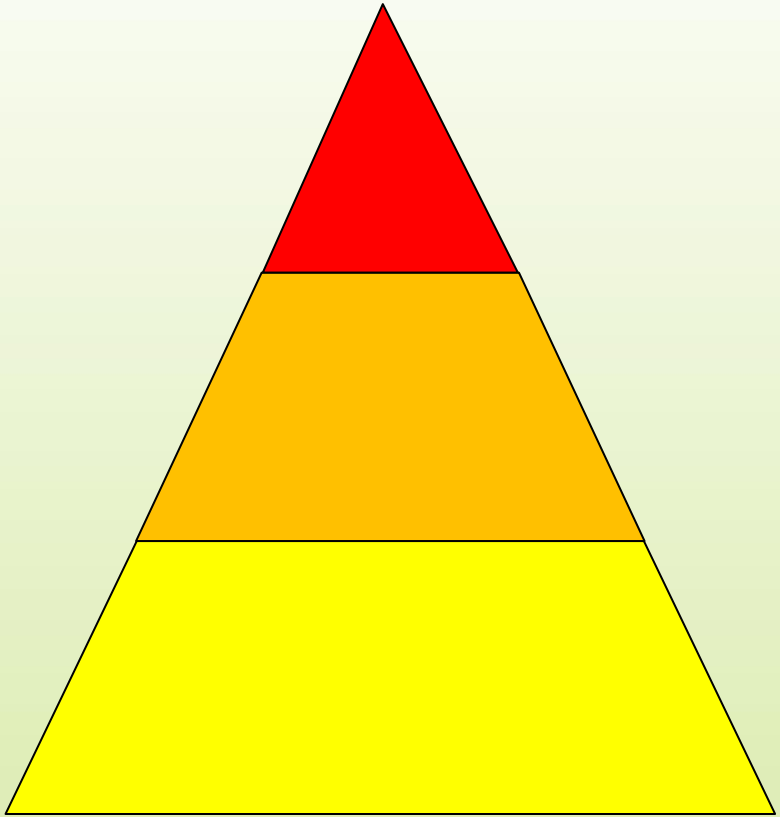
Risk Rating Matrix

Likelihood of Failure and Impact	Consequences			
	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

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

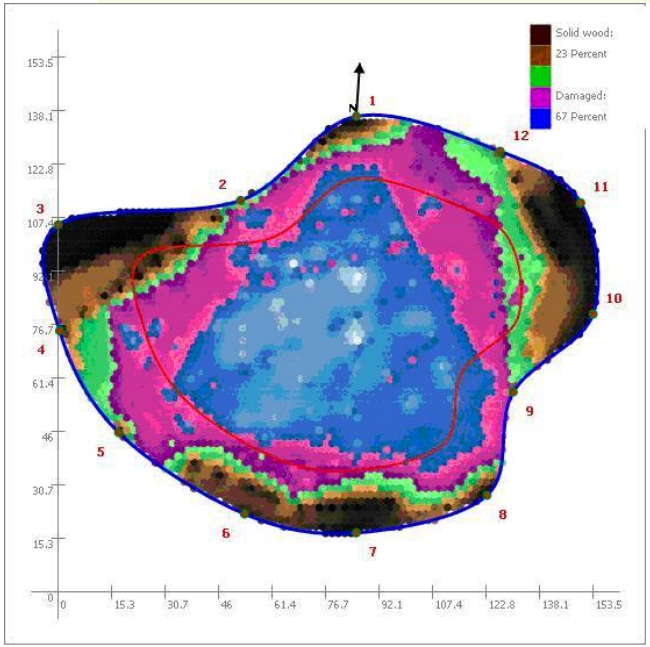
Risk Management: Balancing Risk and Cost?

- At the lowest levels, large risk reductions are possible with minimal investment. Simple measures
- In between, further risk reduction becomes more costly. More complicated measures must be taken to increase safety
- At the very top, elimination of all risk becomes so expensive, that most people are willing to live with some degree of risk



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Risk Management: Balancing Risk and Cost?



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

TRAQ Assessment Levels

These levels are defined in the International Society of Arboriculture's *Best Management Practices: Tree Risk Assessment*

Level 1 Limited Visual Assessment (Windshield Survey / Aerial Patrol)
Level 2 Basic Assessment (360 Degree Walkaround / Basic Tools)
Level 3 Advanced Assessment (Advanced Tools / Boots Off Ground)

These BMP's are based on ANSI A300 Part 9 Standards and the ISA Tree Risk Assessment BMP and Manual

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Identifying Tree Risk

Perform a Level 1 Tree Risk Assessment

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

A Level I Limited Visual Assessment is intended primarily for efficiently managing larger populations of trees

GREAT LAKES URBAN FORESTRY MANAGEMENT

A GRAF TREE CARE COMPANY

A Level 1 Assessment can be a part of a tree inventory

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

A Level I Assessment is a screening process to assess the member agency's tree populations to identify those trees having an "imminent" or a "probable" likelihood for structural failure.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Level 2 and Level 3 Assessments

Trees needing additional higher levels of assessment may be found in the Level 1 Assessment.

For instance, a valuable tree with a cavity of unknown extent may not show evidence of an imminent or probable risk of failure but may deserve a more comprehensive Level 2 or Level 3 Assessment .

Level 2 Assessments

A Level 2 Basic Tree Risk Assessment Inspection will:

- Determine targets and target zone.
- Thoroughly inspect the tree visually from ground level.
- Review site history, conditions and species failure profile.
- Assess potential tree loads.
- Assess general tree health.
- Record observations of site conditions, defects, and outward signs of possible internal defects and response growth.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Level 3 Assessments

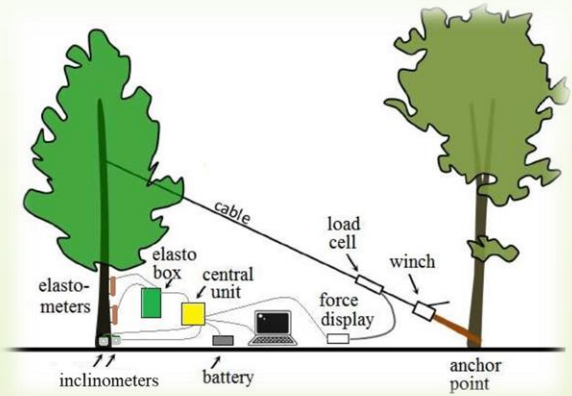
A Level 3 Advanced Assessment will utilize one or more specialized techniques and tools:

- Aerial inspection using drones, climbers, or lifts.
- Decay testing using specialized equipment (sonic tomography/resistance drill).
- Detailed target analysis of property values and occupation rates.
- Detailed site evaluation.
- Tree health assessment.
- Root and root collar inspection and analysis.
- Wind load testing/analysis.
- Measurement of changes in trunk lean.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

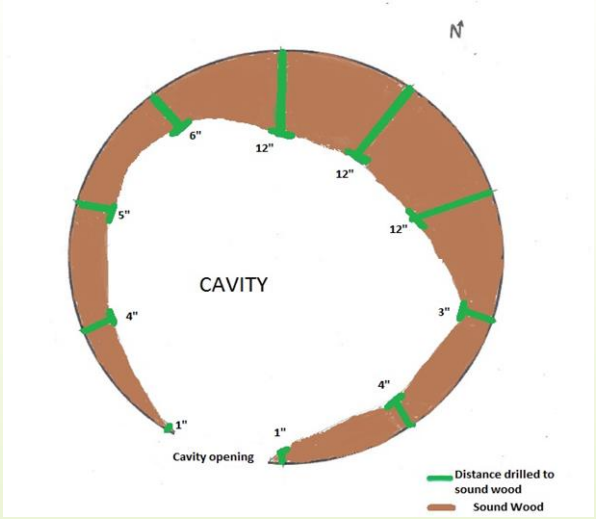
What Are Advanced Tools?

- Resistance Drill
- Regular Drill
- Sonic Tomograph
- Tree Check
- Drones
- Climbers
- Bucket Trucks/Lifts
- Pull Testing equipment
- ???????



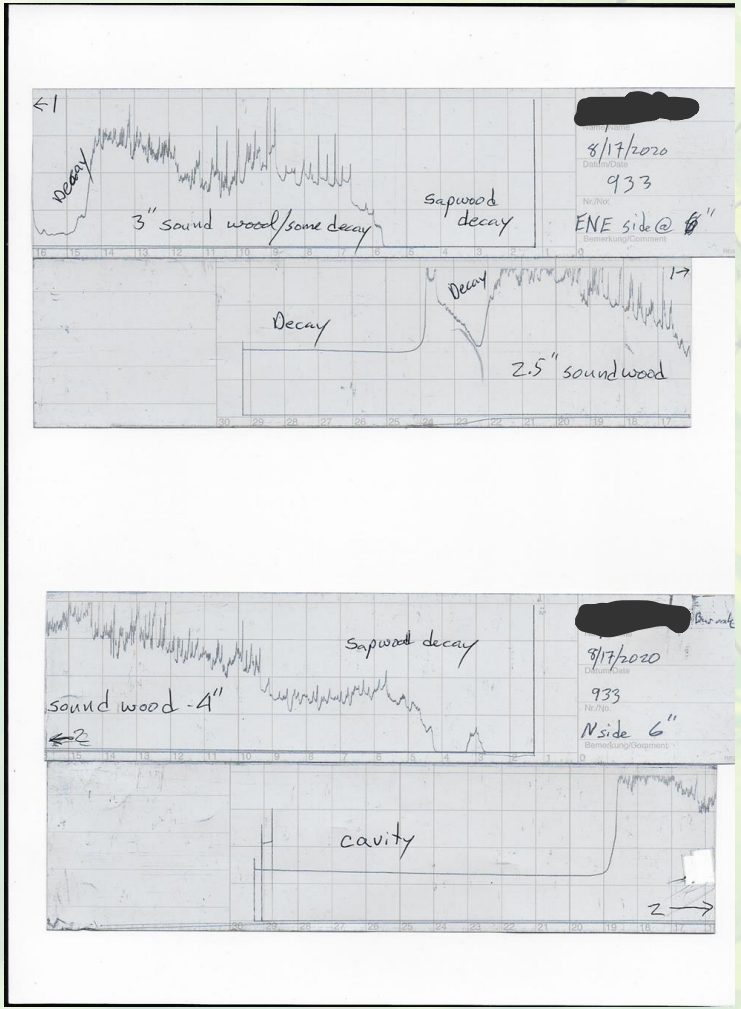
GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Level 3 Advanced Assessments



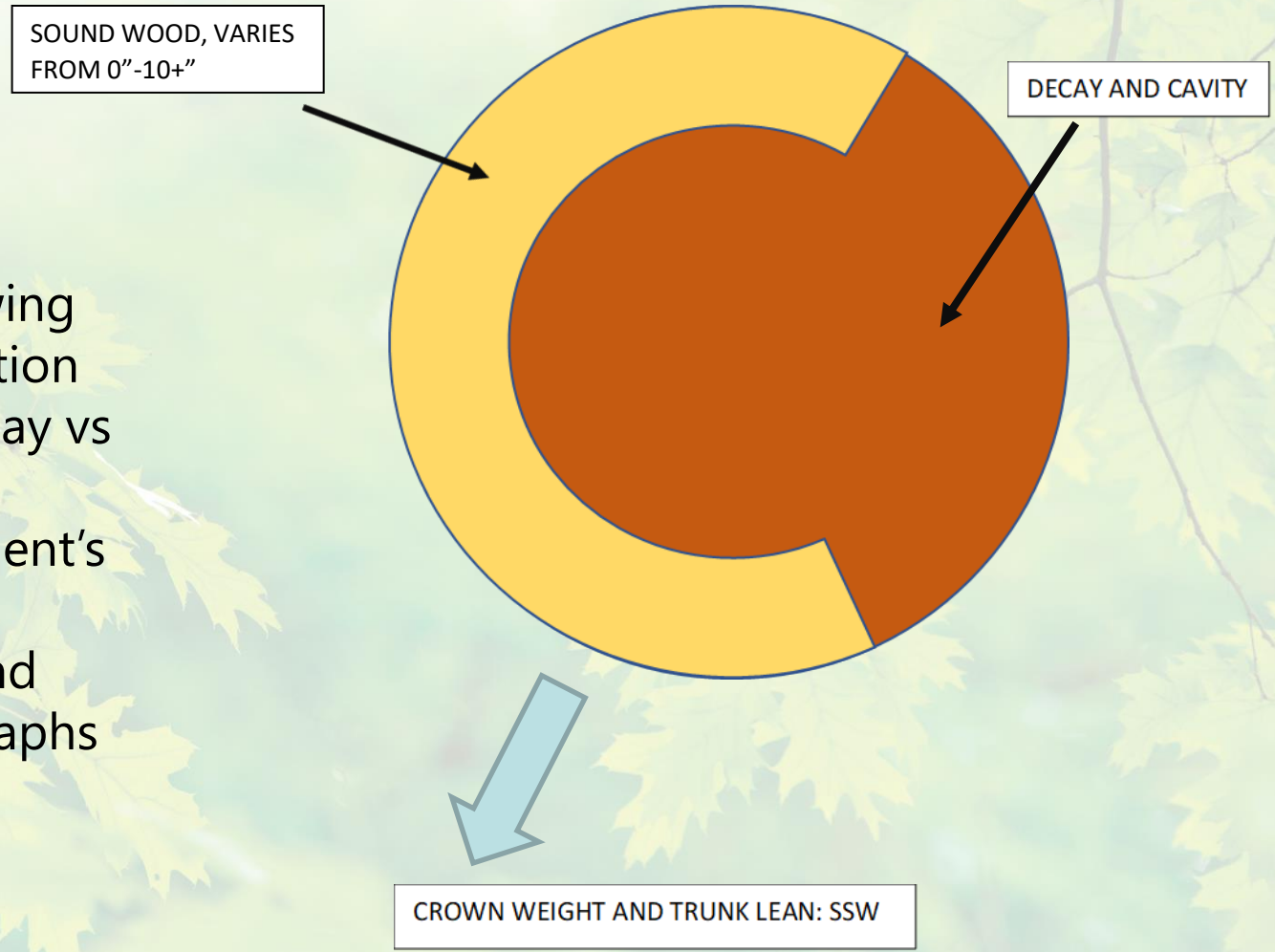
GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Use of graphing resistance drill determines exact extent of decay



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

A schematic drawing showing the location and extent of decay vs sound wood was created for the client's report using measurements and resistance drill graphs



GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

How Long Does an Assessment Take?

- Depends on level and client wishes
- Level 1 = Travel, a few minutes of site time, plus reporting on the back end (1-2 hours)
- Level 2 = About an hour to complete the TRAQ form, plus all of the above and more detailed reporting (2-4 hours)
- Level 3 = Use of advanced tools, more preparation on the front end, and all of the above plus significant reporting (5-10 hours)

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Reporting: Different Levels

- Verbal Report: Buyer beware. This is an acceptable reporting method, but can lead to “he said / she said” if anything winds up in court.
- Letter Report: Shorter written report that covers the basics of the assessment. 3-10 pages (appx). Good for most reports
- Booklet report: Lengthy report when all details have to be covered. Includes index, glossary, etc. Use when litigation is involved and high levels of details are required.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Reporting

TASK	DESCRIPTION	TIMELINE
YEAR 1		
Priority Prune Quadrants 1,2	Create RFP and/or work orders, bid contracted work, schedule pruning	Complete by March 31, 2020
Priority Removals - All	Create RFP, bid contracted work, schedule removals	Complete by March 31, 2020
Perform Level 2,3 Risk Assessments	RFP within 45 days, Assessments within 30 days	Complete assessments by June 1, 2020
Mitigate Risk based on Level 2,3 Assessments	Within 45 days of receipt of Recommendations	Complete by Oct 1, 2020
YEAR 2		
Priority Prune Quadrants 3,4	Create RFP and/or work orders, bid contracted work, schedule pruning	Complete by March 31, 2021
Standard Removals	Budget for 2021, schedule Standard Removals	Complete by December 31, 2021
Monitor 11 trees called out in the report	TRAQ Arborist inspects trees for any changes	Annually by November 15

A **Level 1 Tree Risk Assessment** report should be generated that notes trees found with significant defects by location, species, size and description of defect(s). Risk mitigation and prioritizations options should be generated.

ID	COMMON_NAME	DBH	CONDITION	ARBORIST_REC	REC_REASON	REC_REASON_2
1	BUCKEYE-OHIO	22	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	ROT-HEARTWOOD
2	ELM-SIBERIAN	34	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	ROT-HEARTWOOD
3	ELM-SIBERIAN	12	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
4	ELM-SIBERIAN	17	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	ROOTS-WOUNDED
5	ELM-SIBERIAN	31	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	ROT-HEARTWOOD
6	ELM-SIBERIAN	31	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
7	ELM-SIBERIAN	25	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	WEAK TRUNK UNION
8	ELM-SIBERIAN	16	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
9	HONEYLOCUST	28	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
10	COTTONWOOD	51	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
11	MAPLE-SILVER	29	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
12	ELM-SIBERIAN	20	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
13	ELM-SIBERIAN	13	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
14	HONEYLOCUST	26	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
15	HONEYLOCUST	33	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
16	HONEYLOCUST	22	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
17	ELM-AMERICAN	33	3	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
18	MAPLE-RED	12	5	REMOVE-STANDARD	ROT-HEARTWOOD	ROOTS-MULT ISSUES
19	MAPLE-SILVER	42	3	PRUNE-PRIORITY	ROT-HEARTWOOD	
20	ELM-SIBERIAN	17	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	
21	ELM-AMERICAN	12	5	REMOVE-PRIORITY	DEAD	
22	ELM-SIBERIAN	32	4	PRUNE-PRIORITY	DEADWOOD-LARGE LIMB	

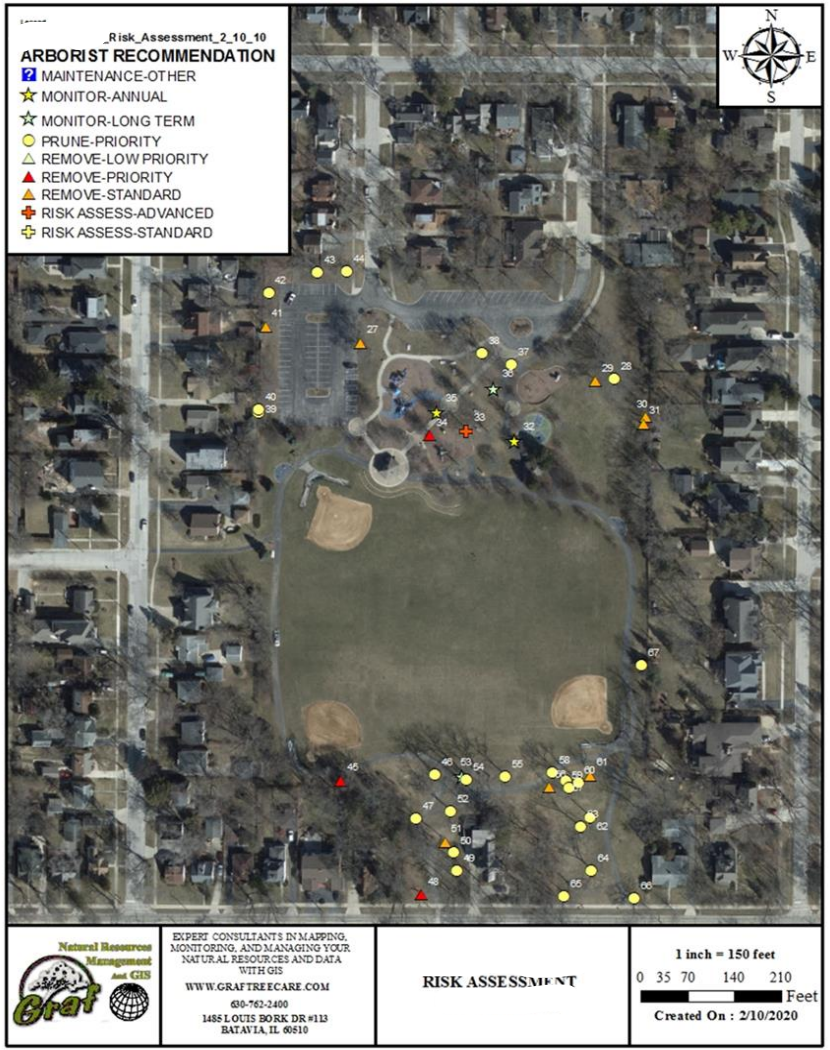
GREAT LAKES URBAN FORESTRY MANAGEMENT

A GRAF TREE CARE COMPANY

Reporting

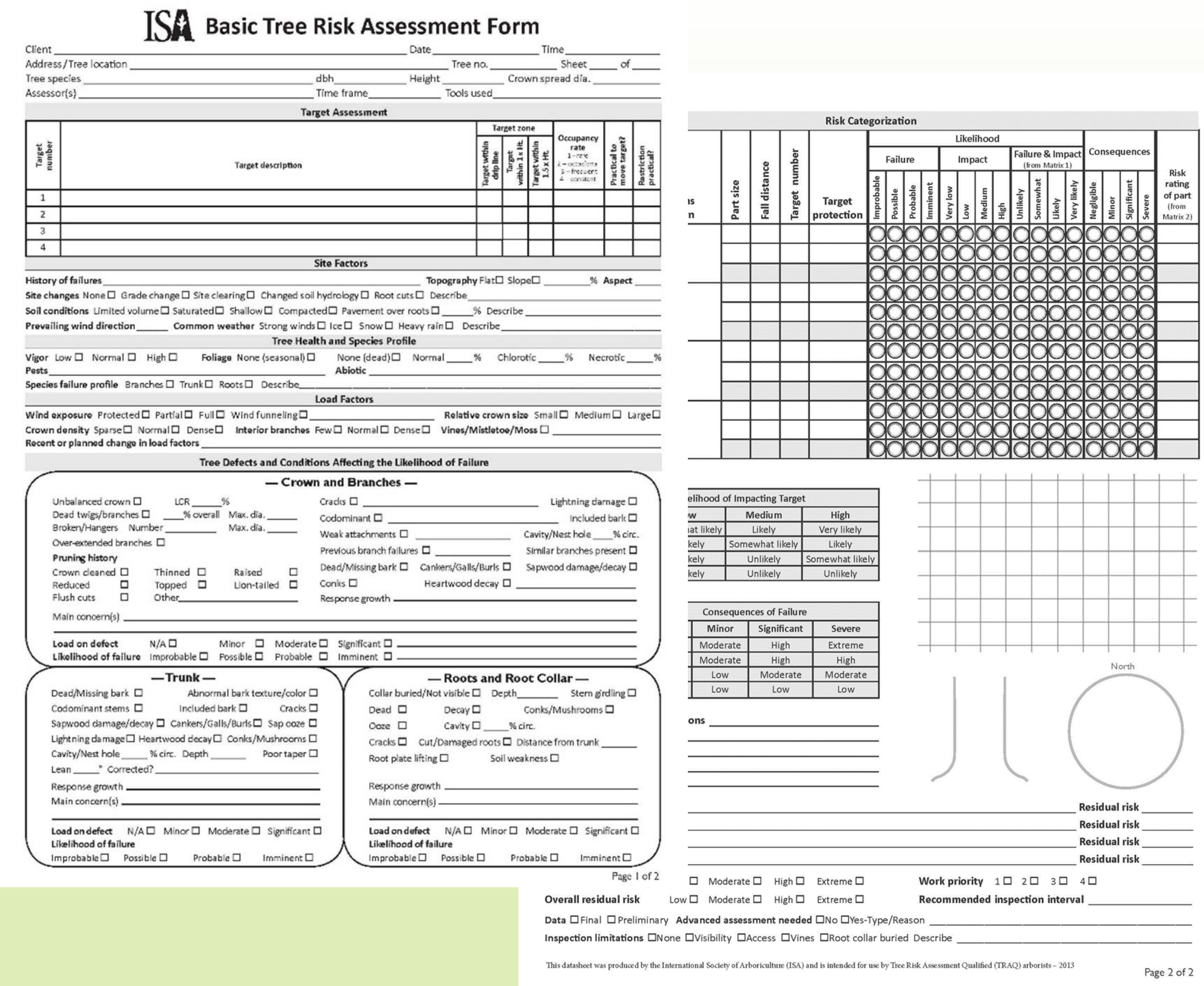
Trees with defects should be mapped.

Ideally in a GIS tree inventory format.



Reporting

Level 2 and 3 reports will utilize an ISA TRAQ form for assessing individual trees, resulting in a Risk Rating, mitigation options, and residual risk information for each tree assessed.



ISA Basic Tree Risk Assessment Form

Client ______ Date ______ Time ______
Address/Tree location ______ Tree no. ______ Sheet ____ of ____
Tree species ______ dbh ______ Height ______ Crown spread dia. ______
Assessor(s) ______ Time frame ______ Tools used ______

Target Assessment

Target number	Target description	Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.	Occupancy rate 1 – rare 2 – occasional 3 – frequent 4 – constant	Practical to move target?	Restriction practical?
1							
2							
3							
4							

Site Factors

History of failures ______ Topography Flat☐ Slope☐ ____% Aspect ____
Site changes None☐ Grade change☐ Site clearing☐ Changed soil hydrology☐ Root cuts☐ Describe ______
Soil conditions Limited volume☐ Saturated☐ Shallow☐ Compacted☐ Pavement over roots☐ ____% Describe ______
Prevailing wind direction ____ Common weather Strong winds☐ Ice☐ Snow☐ Heavy rain☐ Describe ______

Tree Health and Species Profile

Vigor Low☐ Normal☐ High☐ Foliage None (seasonal)☐ None (dead)☐ Normal ____% Chlorotic ____% Necrotic ____%
Pests ______ Abiotic ______
Species failure profile Branches☐ Trunk☐ Roots☐ Describe ______

Load Factors

Wind exposure Protected☐ Partial☐ Full☐ Wind funneling☐ ______ Relative crown size Small☐ Medium☐ Large☐
Crown density Sparse☐ Normal☐ Dense☐ Interior branches Few☐ Normal☐ Dense☐ Vines/Mistletoe/Moss☐ ______
Recent or planned change in load factors ______

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown☐ LCR ____%
Dead twigs/branches☐ ____% overall Max. dia. ____
Broken/Hangers Number ____ Max. dia. ____
Over-extended branches☐
Pruning history
Crown cleaned☐ Thinned☐ Raised☐
Reduced☐ Topped☐ Lion-tailed☐
Flush cuts☐ Other ______
Cracks☐ ______ Lightning damage☐
Codominant☐ ______ Included bark☐
Weak attachments☐ ______ Cavity/Nest hole ____% circ.
Previous branch failures☐ ______ Similar branches present☐
Dead/Missing bark☐ Cankers/Galls/Burls☐ Sapwood damage/decay☐
Conks☐ Heartwood decay☐ ______
Response growth ______
Main concern(s) ______
Load on defect N/A☐ Minor☐ Moderate☐ Significant☐
Likelihood of failure Improbable☐ Possible☐ Probable☐ Imminent☐

— Trunk —

Dead/Missing bark☐ Abnormal bark texture/color☐
Codominant stems☐ Included bark☐ Cracks☐
Sapwood damage/decay☐ Cankers/Galls/Burls☐ Sap ooze☐
Lightning damage☐ Heartwood decay☐ Conks/Mushrooms☐
Cavity/Nest hole ____% circ. Depth ____ Poor taper☐
Lean ____° Corrected? ______
Response growth ______
Main concern(s) ______
Load on defect N/A☐ Minor☐ Moderate☐ Significant☐
Likelihood of failure
Improbable☐ Possible☐ Probable☐ Imminent☐

— Roots and Root Collar —

Collar buried/Not visible☐ Depth ____ Stem girdling☐
Dead☐ Decay☐ Conks/Mushrooms☐
Ooze☐ Cavity☐ ____% circ.
Cracks☐ Cut/Damaged roots☐ Distance from trunk ____
Root plate lifting☐ Soil weakness☐
Response growth ______
Main concern(s) ______
Load on defect N/A☐ Minor☐ Moderate☐ Significant☐
Likelihood of failure
Improbable☐ Possible☐ Probable☐ Imminent☐

Page 1 of 2

Risk Categorization

Part size | Fall distance | Target number | Target protection | Likelihood: Failure (Improbable, Possible, Probable, Imminent), Impact (Very low, Low, Medium, High), Failure & Impact (from Matrix 1) (Unlikely, Somewhat, Likely, Very likely) | Consequences (Negligible, Minor, Significant, Severe) | Risk rating of part (from Matrix 2)

...elihood of Impacting Target

...w	Medium	High
...at likely	Likely	Very likely
...kely	Somewhat likely	Likely
...kely	Unlikely	Somewhat likely
...kely	Unlikely	Unlikely

Consequences of Failure

Minor	Significant	Severe
Moderate	High	Extreme
Moderate	High	High
Low	Moderate	Moderate
Low	Low	Low

North

...ons ______

Residual risk ____
Residual risk ____
Residual risk ____
Residual risk ____

☐ Moderate☐ High☐ Extreme☐ Work priority 1☐ 2☐ 3☐ 4☐
Overall residual risk Low☐ Moderate☐ High☐ Extreme☐ Recommended inspection interval ______
Data ☐Final ☐Preliminary Advanced assessment needed ☐No ☐Yes-Type/Reason ______
Inspection limitations ☐None ☐Visibility ☐Access ☐Vines ☐Root collar buried Describe ______

This datasheet was produced by the International Society of Arboriculture (ISA) and is intended for use by Tree Risk Assessment Qualified (TRAQ) arborists – 2013

Page 2 of 2

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Don't Be Afraid of Knowing Risk!

- There is a fear of knowing risk from trees, sidewalks, etc
- Ignorance is ALMOST never a good defense!
- Having a risk management strategy based on knowledge is a better plan
- Prioritizing risk mitigation can only be done based on data
- If tree #40 fails when you're still working on tree #20, at least you can say you have a plan.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Defining the Assignment

- Always define in your proposal or RFP what you will be doing or expect to be done, and also what you will not be doing or expect to be done.
- This is a difficult thing to do, But defining your terms will make sure you cover yourself in the event of litigation.
- “Well why didn’t you _____?”. Well, you didn’t tell me to, and here it is in writing.
- For practitioners, make sure you have errors and omissions policy before doing a risk assessment

Comments on TRAQ

- It's actually very difficult to get a tree to be High or Extreme Risk, every category must be worst or next to worst case scenario
- NOT quantitative. i.e. does not say tree is "80% Risk"
- Is not a "recommendation based" system. i.e. it is ultimately up to the tree owner to decide the level of risk they are willing to tolerate
- That said, it does require mitigation options to be presented
- Newer system based on input from insurance industry, and therefore they are much more amenable to it than the old "Hazard Tree Forms"
- 3 Inspection levels: Level 1 = Limited Visual (drive by), Level 2 = Basic (360 degree walk around with basic tools), Level 3 = Advanced (Advanced tools involved).

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Create a Tree Risk Policy

The Tree Risk Management Policy should state:

- Who is responsible for the care and maintenance of the agency's trees.
- The benefits of the urban forest are to be balanced with potential risks that trees may pose to people and property.
- The Agency intends to make efforts to identify and manage tree risk and will make risk mitigation decisions based on the risk levels found, level of acceptable risk, budget constraints, and other factors that affect work priorities.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

The Policy Statement formalizes that the Agency will:

- Identify owned and/or maintained trees
  - How? Through a current tree inventory or other method.

- Utilize current professional standards and BMPs for risk assessments.
  - Define the standards i.e. ANSI A300 Part 9 and ISA BMPs.

Public vs. Private Trees and Risk Management

- If it's your tree, it's your problem. Every day, every time, every way.

"...When McDonald's refused to raise its offer, Liebeck retained Texas attorney Reed Morgan. Morgan filed suit in New Mexico District Court accusing McDonald's of "gross negligence" for selling coffee that was "unreasonably dangerous" and "defectively manufactured""

-Andrea Gerlin, *Wall Street Journal*, "A Matter of Degree: How a Jury Decided that a Coffee Spill is Worth $2.9 Million"

- Trees on private property are decidedly more difficult. If the tree has the ability to impact the Right-of-Way, the Village may or may not decide to notify the homeowner.
- Legally this can get tricky, so tread lightly when establishing ordinances for private trees. They would need to be deemed high risk and in imminent danger of failure without direct access, and once identified, would hold the property owner liable for negligence.
- Public Tree? STRONG policy. Private Tree? Weak to no policy.

Tree Risk Policy: Mitigation

Risk mitigation options such as barricading, pruning, cabling, bracing, removal or other means will be prioritized by specified staff.

Timeframes for mitigation based on Risk Rating

- “Extreme Risk” trees mitigated as soon as possible (1-2 days)
- “High Risk” trees mitigated as soon as practical, when work and schedule allows.
- “Moderate Risk” trees may be mitigated or monitored over longer time frame (months or years)
- “Low Risk” Trees may not need any mitigation, only monitoring.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

In summary, to manage tree risk, you should:

- Create policies and procedures that show your intent to manage tree risks.
- Conduct a Level I Limited Visual Tree Risk Assessment on defined tree populations on your agency's properties.
- Identify potential high-risk trees.
- Define risk mitigation options.
- Conduct higher levels of assessment where appropriate.
- Develop a management plan.
- Implement plan.

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

How Long Do We Want Trees To Live?

- Bigger trees provide greater benefits, right?
- So don’t we want trees to get as large as possible?
- Benefits provided vs long term cost of maintenance and eventual removal?
- “Hidden” cost of increased risk and potential liability?
- Is there a rational limit?
- How do we figure that out?

GREAT LAKES URBAN FORESTRY MANAGEMENT
A GRAF TREE CARE COMPANY

Steve Lane

- steve@graftreecare.com
- 224-433-1124

April Toney (IAA)

- april@illinoisarborist.org

Debbie Fluegel (Strike Team /Trees Forever)

- dfluegel@treesforever.org

Mike Brunk (IDNR / Strike Team

- Michael.Brunk@Illinois.gov