


Tree Risk Management in Urban Tree Care

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Tree Risk Assessment

- Level 1 assessment
- Mobile app
- <http://texasforestinfo.tamu.edu/MobileApps/index.html>
- iTunes / Google Play




Tree Risk Assessment BMP

- Conflicts
 - Obstruction
 - Utility
 - Pavement displacement
 - Fire
 - Thorns / fruit
 - Lightning
 - Road edge


Tree Risk Assessment

- Residual risk
- Examples
- Abatement treatments
- Large number of trees/numerical rankings
- What is a risk assessment?




Residual risk


- Risk remaining after abatement treatment...
- Level needs to be acceptable to client
- 63" Monterey cypress





Residual risk


• Mode:	whole tree/street
• Failure:	probable
• Impact:	high
• Failure/impact:	likely
• Consequence:	severe


• Risk:	High
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 Residual risk


- What would be the residual risk if the tree were pruned?




 Residual risk

- Mode: whole tree/street
- Failure: **possible**
- Impact: high
- Failure/impact: **some-what likely**
- Consequence: severe
- Risk: **Moderate**



 Residual risk

- What type of pruning would reduce the risk?
 - Reduction
 - Thin
 - Clean
 - Raise



 Risk assessment: Coast live oak

- 34" diameter
- Private residence
- Dominated rear yard
- Approx. 60 years old
- Planted



 Risk assessment: Coast live oak

Level 2:
Basic visual inspection



 Risk assessment: Coast live oak

- **Level 3:** Advanced inspection
- Root collar excavation
 - Old, dry canker
 - Flat area at base with dead tissue
 - Soil wet with strong odor



Risk assessment: Coast live oak


Failure Mode	Likelihood: Failure	Likelihood: Target	Likelihood	Consequences	Risk Rating
Whole tree / house	Probable	High	Likely	Severe	High
Branch / house	Probable	High	Likely	Significant	High
Stem on west / spa	Probable	Low	Unlikely	Severe	Low

Risk assessment: Coast live oak

Type of failure	Likelihood : Failure	Likelihood : Target	Likelihood	Consequences	Risk Rating
Whole tree	Probable	High	Likely	Severe	High
Branch	Probable	High	Likely	Significant	High
Prune	Possible	High	Somewhat likely	Significant	Moderate
Stem on west	Probable	Low	Unlikely	Severe	Low
Prune	Possible	Low	Unlikely	Severe	Low

Risk assessment: Blue gum

- Street right-of-way
- 55" diameter
- Good form & structure; no branches on N.
- Good health & vigor
- No displacement of adj. pavement
- **Adj. tree failed**



Risk assessment: Blue gum

Level 2:
Basic visual inspection





Risk assessment: Blue gum

Type of failure	Likelihood : Failure	Likelihood : Target	Likelihood	Consequences	Risk Rating
Whole tree / house	Possible	High	Somewhat likely	Severe	Moderate
Branch / child on sidewalk	Possible	Low	Unlikely	Severe	Low
Branch / parked car	Possible	Medium	Unlikely	Significant	Low


Risk assessment: Blue gum


- **Failure mode: whole tree & house**
- Would reducing the crown by 25% reduce the likelihood of failure from possible to improbable?
- If not, residual risk is the same: **moderate**




 Risk assessment: Blue gum


- Failure mode: whole tree & house
- Does crown reduction prevent the tree from impacting the house?





 Risk assessment: Blue gum


- Failure mode: branch & person on sidewalk
- Would pruning to reduce the length of long branches by 25% reduce the likelihood of failure from possible to improbable?
- Risk rating remains the same: **low**






 Abatement treatment

- Abatement treatments, including pruning, are most effective when applied to specific defects
- Short- vs. long-term effects?






 Abatement treatment


 Abatement treatment


- Early structural pruning
- Focus on branches:
 - Distribution
 - Attachment
 - Height
- Quality stock

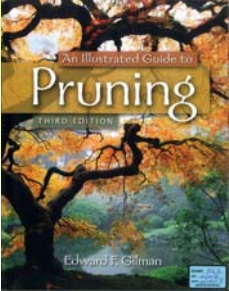
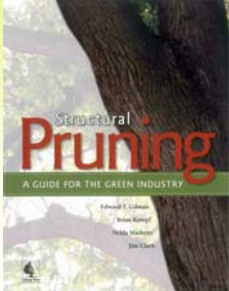



 Likelihood of Failure

- Singapore
- 12,000 failures over 10 years (storm events)
- Branch: 70%
- Trunk: 8%
- Root: 22%





 Abatement treatment


 Abatement treatment

- Be realistic about effect tree care treatments have on likelihood of failure
- Focus on preventing defects by structural pruning young trees



 Residual risk


- What type of pruning would reduce the risk?
 - Reduction
 - Thin
 - Clean
 - Raise




 ISA Tree Risk BMP


- **Groups of trees**
 - Multiple failure modes
 - More complex assessing, recording & reporting




 ISA Tree Risk BMP

- **Groups of trees**
 - Reduce the number of failure modes to assess



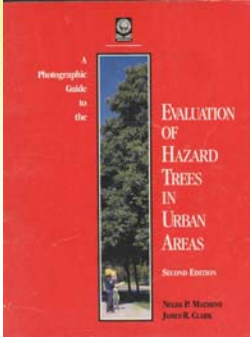
 ISA Tree Risk BMP

- **Groups of trees**
 - Reduce the number of failure modes to assess
 - Determine if goal is risk assessment for every tree or rank relative risk?




ISA Tree Risk BMP

- Numerical ratings?**
 - BMP – no specific prohibition
 - Tend to over-estimate risk
 - Prioritize work vs. determine risk



ISA Tree Risk BMP

- Historical use of numerical systems?**
- Recreation & Park Department. San Francisco.
 - > 200 properties
 - > 3,000 acres
 - > facilities
 - > 130,000 trees





ISA Tree Risk BMP

	Risk Ranking			No. of Trees	
	≤8	≥9	% ≥9	Total	%
Monterey cypress	2266	137	21.4%	2403	24.4%
Blue gum	2173	125	19.5%	2298	23.4%
Monterey pine	1487	253	39.5%	1740	17.7%
Coast redwood	286	7	1.1%	293	3.0%
Total	9199	641	6.5%	9840	100%


ISA Tree Risk BMP

- Conversion of old numerical ratings to current BMP terminology?**

ISA Tree Risk BMP


- 63" Monterey cypress
- Failure: probable
- Impact: high
- Failure/impact: likely
- Consequence: severe
- Risk: High**




ISA Tree Risk BMP


- 63" Monterey cypress
- Failure: whole tree
- Target: city street
- Failure pot'n: 2
- Size of part: 3
- Target: 4
- Risk ranking: 9**




 ISA Tree Risk BMP


- Converting large numbers of tree rankings to current risk assessment method
- Only one failure mode




 ISA Tree Risk BMP


- **Tree risk assessment**
 - Systematic process used to identify, analyze & evaluate tree risk
- **Risk**
 - Likelihood of tree failure
 - Likelihood of striking a target
 - Consequences




 ISA Tree Risk BMP


- Is reporting a tree problem to a supervisor a risk assessment?




 ISA Tree Risk BMP

- Is reporting a tree problem to a supervisor a risk assessment?
- Difference between identifying a defect & performing a risk assessment



 ISA Tree Risk BMP


- Is a pre-climbing inspection a risk assessment?
- Z133
- “Prior to climbing operations, a visual inspection of the entire tree should be performed.”




 ISA Tree Risk BMP


- Is a pre-climbing inspection a risk assessment?
- Difference between safety inspection & risk assessment




 ISA Tree Risk BMP


- Is condition evaluation as part of a tree appraisal a risk assessment?
- 9th edition
- “Trees posing unreasonable risks should not be appraised for amenity monetary value: removal should be recommended.”




 ISA Tree Risk BMP


- Is condition evaluation as part of a tree appraisal a risk assessment?
- Difference between assessing health & structural condition vs. risk assessment?
- “Unreasonable risks...”




 ISA Tree Risk BMP


- Is preparing an estimate for tree work a risk assessment?




 ISA Tree Risk BMP


- Is preparing an estimate for tree work a risk assessment?
- Brief inspection vs. detailed risk assessment?
- Document



 Tree Risk Assessment

- Residual risk
- Examples
- Abatement treatments
- Large number of trees/numerical rankings
- What is a risk assessment?



 ISA Tree Risk BMP

- Large trees in urban settings possess some risk of failure
- Large trees in urban settings provide a wide range of benefits

