Tree Appraisal and the Value of Trees

Trees provide many benefits and value to property owners in functional, aesthetic, social, environmental — and even economic — ways. Functional benefits include mitigating climate change by storing carbon, removing pollution from the atmosphere, managing stormwater runoff, and improving air quality. Research finds that trees provide oxygen and shade, which impacts home cooling costs among other benefits, and healthy, mature trees can increase property values by up to 15%. The collective value of trees makes a difference in the health and quality of life in cities and towns everywhere. In fact, it is possible to calculate the benefits provided for each individual tree in any landscape by visiting https://mytree.itreetools.org/.

What is the value or worth of a tree?

Value may be defined as the monetary worth of an item at a given time with the expectation of benefit. Many of these benefits can be quantified by a dollar figure in a formal tree appraisal, which provides an estimate or approximate value; however, the true worth may be judged by a sale or by a court ruling in litigious situations. The valuation of trees and living landscape components requires training, expertise, and experience. You should retain the services of a qualified consulting arborist who can properly apply the methods and techniques that best relate to the situation. Plant appraisers have the responsibility of assigning values and must always be prepared to defend, explain, and support their appraisal product, just like any real estate or other professional appraiser.

Three methods used to appraise trees and landscapes — Cost Approach, Income Approach, and Sales Comparison Approach — are described in the Guide for Plant Appraisal, 10th edition, authored by the Council of Tree and Landscape Appraisers (CTLA) and published by the International Society of Arboriculture. The guide is endorsed by the major arboriculture, horticulture and real estate industry organizations and is a critical resource for sound plant valuation.
Why should a tree be appraised?
An appraisal assigns monetary importance to trees on a site to indicate their contribution to it, especially when construction may impact plants on the property. Basically, an appraisal is the development of an opinion of value or cost of landscape elements on the site. The purpose of an appraisal is defined by the clients’ needs. These needs may include unexpected losses, tort claims, insurance claims, tax deductions, real estate assessment, and proactive planning.

The best time to conduct an appraisal is prior to any incident or damage; however, most appraisals are done after trees have been removed or damaged. This situation requires additional investigation and might include determining pre-casualty value or sampling on a local basis for comparisons. If available, previous site records, tree assessments, site review, and even a witness can help determine the trees’ pre-damage condition. With all the facts gathered, it is the duty of the appraiser to determine the appropriate method and provide an unbiased valuation. The appraiser should document all activities related to the process, from initial contact with the client — including establishing the background information on the tree — to inspecting the site, collecting data, and formulating a reasonable and defensible value.

One technique outlined in the Plant Appraisal Guide is the Trunk Formula Technique (TFT), which appraises larger trees in the landscape within the Cost Approach. This technique, used by professional appraisers, extrapolates the costs to purchase the largest commonly available nursery plant to the size of the appraised plant. This means that we can take the costs of a nursery plant and proportionally increase it to infer the cost of a larger plant. Small trees, less than 4” caliper or an 8-foot conifer, would be retail cost.

Values based on application of the TFT is a calculation generated by using “unit costs.” The unit costs required for the formula must be obtained either from local resources determined by the consulting arborist or collected by the Regional Plant Appraisal Committee (RPAC). This committee is comprised of industry experts typically associated with the International Society of Arboriculture local chapter. The RPAC gathers data based on statewide information to determine unit costs for commonly available trees, obtainability and functional limitations of common trees in your area. The information and data provided by the RPAC is a baseline for species; it is the responsibility of the
The ratings for common Indiana tree species can be found by visiting the Indiana Arborist Association website at www.indianaarborist.org. Based on statewide surveys in Indiana, it has been determined that for the computations needed for cost techniques, the largest commonly available transplanted deciduous tree would be 3.5 caliper inches with a unit cost of $37.71.

When calculating the value of a tree using the TFT, compute the cross-sectional area of the tree multiplied by the unit price. Cross-sectional area is determined by squaring the radius of the trunk at 4.5 feet or diameter at chest height and multiply by 3.14. Then, multiply the cross-sectional area times the unit price to obtain the value. For example, if a tree is 20 inches diameter, the computation would be 10 x 10 x 3.14 = 314 inches. When area is determined, multiply it by the unit cost to get the overall basic cost. For example, 314 inches x $37.67 = $11,828. However, this is not necessarily the “value” of the tree. There are more factors that will affect the value of the plant, which is why a professional appraiser is recommended.

**Factors in Appraisals**

**Depreciation**

An accurate appraised value will require the application of depreciation factors. Appraisers use depreciation in the valuation process to justify differences in a new, “perfect” tree as compared to the appraised tree. This will account for less than ideal plant characteristics, placement in the landscape or the site it occupies. The three factors or variables for depreciation include actual condition of the tree, functional limitations and external limitations.

**Condition**

Condition refers to assessing overall tree health. Look at vigor, presence of pest issues and any stress symptoms. Another consideration is assessing the structure and form of the tree. Review the branch habit to determine if it is a strong, stable structure with good branch attachments and spacing. Does the tree have a good form for the species? Each species has a typical genetic form or “normal” traits which should be representative of the species. However, most trees aren’t normal or typical. See Table 1 for more information on rating the condition.
**Functional limitations**

Functional limitations applied in the depreciation process are associated primarily with the tree itself or the site on which it is located. These are factors that may limit future growth and development and overall health. Consider the site conditions and placement, such as proximity to utility lines, that could limit full development due to necessary pruning for clearance. Finally, investigate for any genetic limitations related to the genus and species itself. This would include naturally poor branch systems, susceptibility to pests, or invasive tendencies as examples that would depreciate the value of the tree.

**External limitations**

External limitations play a role in depreciation as well. These factors include issues outside the control of the tree owner that may affect sustainability, structure health or form. Examples include environmental issues such as water availability, threat of pest issues or utility vegetation management concerns where there are impending conflicts between power lines and the tree. Additionally, local ordinances or easements may be factors which impact life expectancy. Additionally, local ordinances or easements may be factors that affect life expectancy.

The appraiser will assign a rating to each of the depreciation categories when applying depreciation to basic cost. The categories are condition, functional limitations, and external limitations. The basic cost is multiplied by each of the three categories to estimate the depreciated cost — the final functional reproduction value using the Trunk Formula Technique.
The Trunk Formula Technique is only one way of appraising large trees. It is important to realize that these estimates of value may not be proportionate to the value of the property or what would actually be paid for the tree. Research studies have estimated that trees may account for up to 15 percent of the value of a residential property. In other circumstances, much lower values could result, depending on location and other factors.

For example, an ideal, mature 24”dbh sugar maple may be valued at over $15,000 but the home it resides next to may be worth $50,000. This is an unrealistic value for the tree that is not reasonable in any appraisal situation. Legitimate appraisal values should be reasonable and defensible — and that requires a knowledgeable consulting arborist.

**Tree Appraisal Scenario**

Let’s put the Trunk Formula Technique to work with an example for a typical suburban landscape.

**Example**

A residential site in an Indiana neighborhood has a Sugar Maple, *Acer saccharum*, in the front lawn, shading the front of the home. The tree measures 14 inches at chest height and is in good condition and in a proper location. The tree owners wish to have it appraised to determine the value of the tree on their property.

The calculation would be as follows:

1. **Basic Reproduction Cost = CSA x UTC**
   
   CSA = Cross-sectional area of the subject tree
   
   UTC = Unit tree cost, determined by the Regional Plant Appraisal committee or local wholesale cost.

2. **Depreciated Reproduction Cost = CR x F x E x BRC**

   BRC = Basic Reproduction Cost
   
   CR = condition rating
   
   F = function limitations
   
   E = external limitations

3. **Additional costs = cleanup, installation costs, maintenance**

   *These other costs would be included if there is a loss requiring removal of a tree and installing a new tree along with the post-planting care costs for a determined time.*

4. **Total reproduction cost = DRC + TAC**

   DRC = Depreciated Reproduction Cost
   
   TAC = Total Additional Costs

5. **Appraisal Value completed with total reproduction cost rounded.**

Back to our example using the steps above:

1. $154” x $37.7 = $5,805
2. $1.0 x .80 x 1.0 x $5,805 = $4,644
3. 0 - Not applicable
4. $4,644 + 0 = $4,644
5. $4,644

**Following the calculated steps, the reproduction value of the tree would be $5,000.**

This value is the reproduction cost of the tree should it be destroyed or lost. In other words, this number is the cost to replace a tree with an exact replica.

There are other approaches, methods, and techniques used to estimate costs and tree value dependent upon appraisal situations. These applications may be found in the *Guide for Plant Appraisal, 10th Edition*. Arboricultural consultants should utilize the guide for development of a professional work product.

Tree appraisal is a professional service provided by consulting arborists. The appraiser may assume the role of mediator, arbitrator, consulting expert, or expert witness. In many situations, an appraisal might be disputed in a lawsuit. The appraiser should maintain professional liability insurance for litigation cost protection. This publication is for educational purposes only to provide an awareness of tree value. When an *expert* opinion is necessary, as for an insurance or legal claim, it is highly recommended that the tree owner consult with a professional arborist.

**American Society of Consulting Arborists, Registered Consulting Arborist:** [https://www.asca-consultants.org/default.aspx](https://www.asca-consultants.org/default.aspx)

**International Society of Arboriculture, Certified Arborist:** [https://www.treesaregood.org/findanarborist](https://www.treesaregood.org/findanarborist)

Tree appraisals must be reasonable and defensible.
Table 1. Condition Rating for Landscape Trees

This rating combines health, structure above and below ground, and form. Each plant can have any combination of the following health or structural issues, and others. The expression of symptoms and signs is subjective. The appraiser should consider the individual species characteristics and use existing circumstances as a reasonable scale for condition determination. This table is a general representation to assist in formula values.

<table>
<thead>
<tr>
<th>Condition Rating</th>
<th>Tree Structure</th>
<th>Tree Health</th>
<th>Formula Values</th>
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<tbody>
<tr>
<td>Excellent</td>
<td>Root plate undisturbed and clear of any obstructions. Root flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.</td>
<td>Perfect specimen with excellent form and vigor, well-balanced crown. Trunk is sound and solid. No apparent pest problems. Normal to exceeding shoot length on new growth. Leaf size and color normal. Exceptional life expectancy for the species.</td>
<td>1.0 - .90</td>
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<tr>
<td>Good</td>
<td>Root plate appears normal; only minor damage may be found. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure; less than 25% of bark section is missing. Good branch habit, minor dieback with some signs of previous pruning. Codominant stem formation may be present. Minor corrections required.</td>
<td>Imperfect canopy density in few parts of the tree, 10% or less, lacking natural symmetry. Less than half normal growth rate and minor deficiency in leaf development. Few pest issues or damage, controllable. Normal branch and stem development with healthy growth. Typical life expectancy for the species.</td>
<td>.90 - .75</td>
</tr>
<tr>
<td>Fair</td>
<td>Root plate reveals previous damage or disturbance and dysfunctional roots may be visible around main stem. Evidence of trunk damage or cavities with decay or defects present. Less than 30% of bark sections missing on trunk. Codominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.</td>
<td>Crown decline and dieback up to 30% of the canopy. Overall poor symmetry. Leaf color somewhat chlorotic with smaller leaves. Shoot extensions indicate some stunting and stressed growing conditions. Obvious signs of pest problems contributing to lesser condition. Some decay areas found in main stem and branches. Below average life expectancy.</td>
<td>.75 - .50</td>
</tr>
<tr>
<td>Poor</td>
<td>Root plate disturbance and defects indicate major damage with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important dead or broken. Canopy reveals signs of damage or previous topping or lopping, with major corrective actions required.</td>
<td>Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting obvious with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe. Extensive decay or hollow. Life expectancy is low.</td>
<td>.50 - .30</td>
</tr>
<tr>
<td>Very Poor</td>
<td>Severe damage within the root plate and root collar exhibits major defect which could lead to death or failure. A majority of the bark or trunk is affected with decay or missing. Branching is extremely poor or severely topped with severe dieback in canopy. Little or no opportunity for mitigation of any tree parts.</td>
<td>More than 70% of the canopy is in severe decline or dead. Canopy density is extremely low with chlorotic and necrotic tissue dominating the canopy. Severe decay in the trunk and major branches. Root plate damage with a majority of roots damaged, diseased or missing.</td>
<td>.30 - .10</td>
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