



Tree Inventory

August 31, 2022

Prepared for:

Laurie Yang
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Mercer Island, WA 98040



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Dear Laurie

On August 31st, 2022, I was called to assess and take inventory of all the significant trees on the property. There were a total of 8 trees of varying sizes and species. The trees consisted of three Redwood, one Mountain ash, two Japanese maple and two Paper birch. I used measuring tape to determine the DBH of the trees and a rangefinder to determine the dripline and height of the trees. All trees have been tagged with metal tags engraved with numbers corresponding to the number listed in the inventory.

Summary of findings

Visiting the site and examining the trees on the property I found that most of the trees were in good or very good conditions, with the two Birch and the Mountain ash as exceptions. The two birch trees are declining mostly because of the aggressive topping cuts made in order to keep the power lines above clear. It is unclear exactly why the Mountain ash is in poor health, but it is likely due to drought stress. These trees are noted on the map and in the inventory.

Methodology

To evaluate the trees and to prepare the report, I drew upon my 8 years of experience in the field of horticulture, site management, and arboriculture and my formal education in natural resources management, natural habitat ecology, plant identification, and plant physiology. I also followed the protocol of the International Society of Arboriculture (ISA) for Visual and Level 2 Assessment (VA and L2) that includes looking at the overall health of the tree as well as the site conditions. This is a scientifically based process to look at the entire site, surrounding landscape and soil, as well as a complete look at the trees themselves. In examining the trees, I looked at such factors as: size, vigor, canopy and foliage condition, density of leaves, injury, insect activity, root damage and root collar health, crown health, evidence of disease-causing bacteria, fungi or virus, dead wood and hanging limbs.

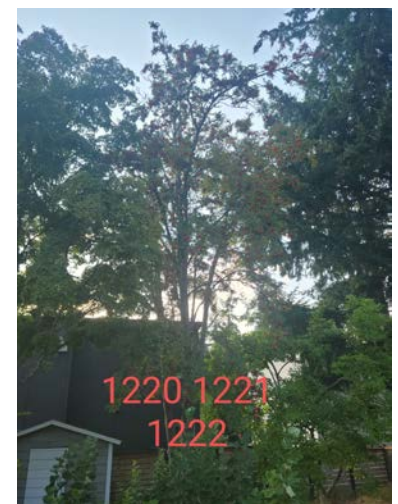
Tree #1199, Redwood, (*Sequoia sempervirens*) The tree is perched on top of a small stone retaining wall at the northeast corner of the property. The tree has a DBH of 33" at a height of 95' and a crown spread of approximately 20'. There is a small fence that is growing against the trunk at the root flare. This tree is part of a cluster of 3 Redwood trees.



Tree #1200, Redwood, (*Sequoia sempervirens*) The tree is located at the northeast corner of the property. The tree has a DBH of 12" at a height of 35' and a crown spread of approximately 17'. This tree is growing subdominantly under 2 larger Redwood trees.

Tree #1201, Redwood, (*Sequoia sempervirens*) This tree is located at the northeast corner of the property amongst a cluster of 3 Redwood trees. The tree has a DBH of 43" at a height of 100' and a crown spread of approximately 19'. This tree is codominant with included bark. The bifurcation starts at approximately 6'. The tree has not created much reaction wood in reaction to this codominance.

Tree #1220, 1221 and 1222, Mountain ash, (*Sorbus americana*) The tree is located approximately 30' south of the northwestern corner of the property and approximately 12' from the west wall. The tree has a DBH of 10", 9" and 7" at a height of 40' and a crown spread of approximately 16'. Although there is one tag per stem, the stems should be treated as one tree. The three stems all originate at ground level. Excavation of the root flare would be needed to determine if there is included bark. The tree is sparse with some significant tip dieback.





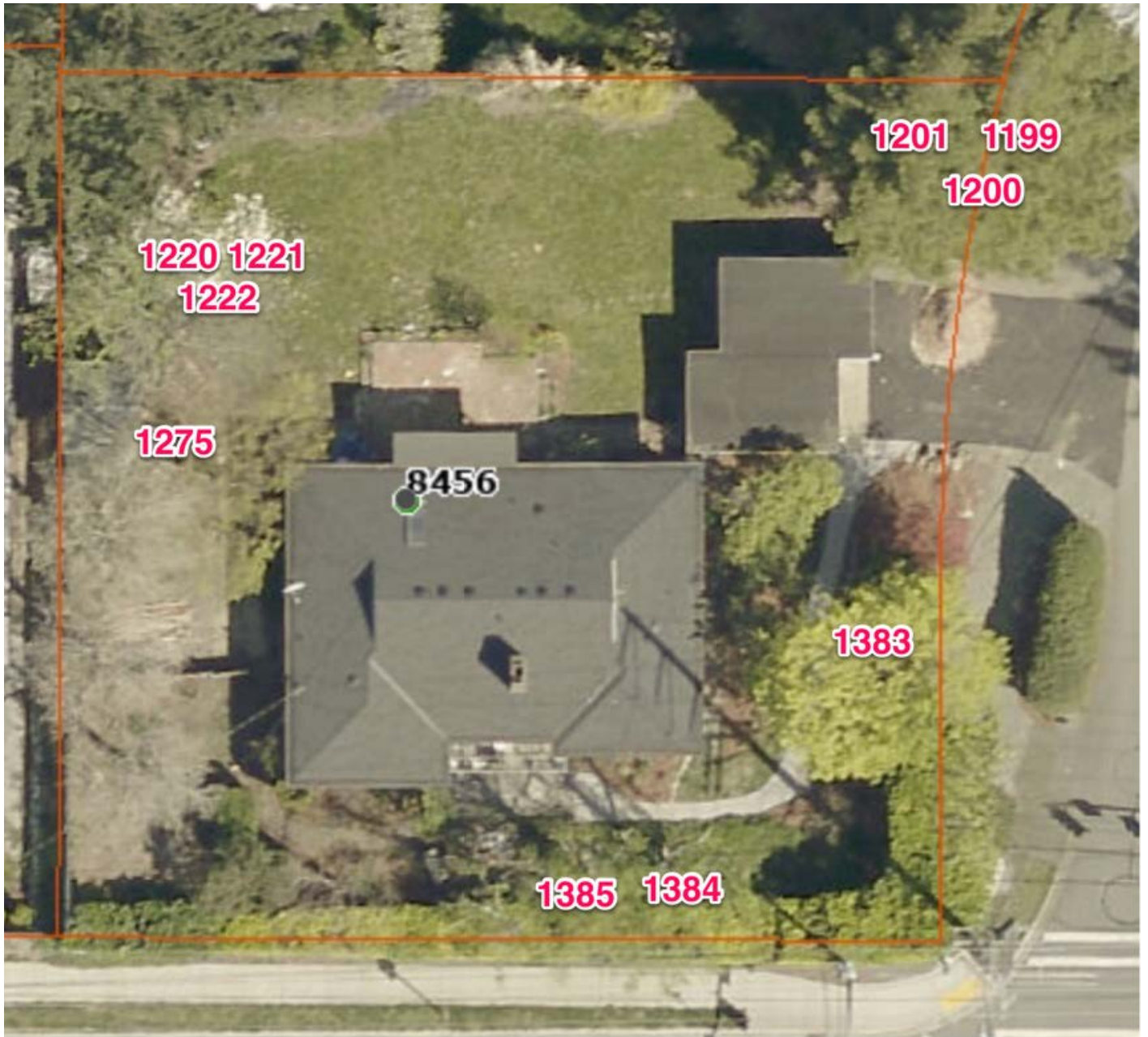
Tree #1275, Japanese maple, (*Acer palmatum*) This tree is located approximately 15' west of the northwest corner of the house. The tree has a DBH of 11" at a height of 30' and a crown spread of approximately 22'. This tree has 3 stems originating from the ground level, all with included bark. Its canopy does overhang the roof.

Tree #1383, Japanese maple, (*Acer palmatum*) This tree is located approximately 25' east of the southeast corner of the house. The tree has a DBH of 10", 10" and 7" at a height of 20' and a crown spread of approximately 19'. Although the tree has several stems, bark inclusion is minimal and the tree is in very good health.



Tree #1384, Paper birch, (*Betula papyrifera*) This tree is located approximately 15' south of the southeast corner of the house. The tree has a DBH of 10" at a height of 20' and a crown spread of approximately 8'. This tree has been topped with sparse suckering growth and signs of severe decay. This tree is in poor health.

Tree #1385, Paper birch, (*Betula papyrifera*) This tree is located approximately 15' south of the front door at the south end of the house. The tree has a DBH of 15" at a height of 20' and a crown spread of approximately 15'. This tree has been topped with sparse suckering growth and signs of severe decay. The tree has large dead branches and branches with fruiting fungal bodies. This tree is in poor health.



Tree #	Species	Latin Name	DBH	Appr Ht	Condition	Dripline Radius	L.O.D. North	L.O.D. East	L.O.D. South	L.O.D. West	Viability
1199	Redwood	(<i>Sequoia sempervirens</i>)	33"	95'	Very Good	20'	To north property line	To impervious parking	To pre existing driveway	45'	Viable
The tree is perched on top of a small stone retaining wall at the northeast corner of the property. There is a small fence that is growing against the trunk at the root flare. This tree is part of a cluster of 3 Redwood trees.											
1200	Redwood	(<i>Sequoia sempervirens</i>)	12"	35'	Good	17'	To north property line	To impervious parking	To pre existing driveway	40'	Viable
The tree is located at the northeast corner of the property. This tree is growing subdominantly under 2 larger Redwood trees.											
1201	Redwood	(<i>Sequoia sempervirens</i>)	43"	100'	Very Good	19'	To north property line	To impervious parking	To pre existing driveway	40'	Viable
This tree is located at the northeast corner of the property amongst a cluster of 3 Redwood trees. This tree is codominant with included bark. The bifurcation starts at approximately 6'. The tree has not created much reaction wood in reaction to this codominance.											
1220, 1221 and 1222	Mountain ash	(<i>Sorbus americana</i>)	10", 9" and 7"	40'	Fair	16'	To north property line	15'	15'	To west property line	Viable
The tree is located approximately 30' south of the northwestern corner of the property and approximately 12' from the west wall. Although there is one tag per stem, the stems should be treated as one tree. The three stems all originate at ground level. Excavation of the root flare would be needed to determine if there is included bark. The tree is sparse with some significant tip dieback.											
1275	Japanese maple	(<i>Acer palmatum</i>)	11"	30'	Good	22'	To north property line	10'	15'	To west property line	Viable
This tree is located approximately 15' west of the northwest corner of the house. This tree has 3 stems originating from the ground level, all with included bark. Its canopy does overhang the roof.											
1383	Japanese Maple	(<i>Acer palmatum</i>)	10", 10" and 7"	20'	Very Good	19'	15'	To east property line	To south property line	15'	Viable
This tree is located approximately 25' east of the southeast corner of the house. Although the tree has several stems, bark inclusion is minimal and the tree is in very good health.											
1384	Paper birch	(<i>Betula papyrifera</i>)	10"	20'	Poor	8'	8'	15'	To south property line	20'	Non-Viable
This tree is located approximately 15' south of the southeast corner of the house. This tree has been topped with sparse suckering growth and signs of severe decay. This tree is in poor health.											
1385	Paper birch	(<i>Betula papyrifera</i>)	15"	20'	Poor	15'	8'	20'	To south property line	15'	Non-Viable
This tree is located approximately 15' south of the front door at the south end of the house. This tree has been topped with sparse suckering growth and signs of severe decay. The tree has large dead branches and branches with fruiting fungal bodies. This tree is in poor health.											

Waiver of Liability

There are many conditions affecting a tree's health and stability, which may be present and cannot be ascertained, such as, root rot, previous or unexposed construction damage, internal cracks, stem rot and more which may be hidden. Changes in circumstances and conditions can also cause a rapid deterioration of a tree's health and stability. Adverse weather conditions can dramatically affect the health and safety of a tree in a very short amount of time. While I have used every reasonable means to examine these trees, this evaluation represents my opinion of the tree health at this point in time. These findings do not guarantee future safety nor are they predictions of future events.

The tree evaluation consists of an external visual inspection of an individual tree's root flare, trunk, and canopy from the ground only unless otherwise specified. The inspection may also consist of taking trunk or root soundings for sound comparisons to aid the evaluator in determining the possible extent of decay within a tree. Soundings are only an aid to the evaluation process and do not replace the use of other more sophisticated diagnostic tools for determining the extent of decay within a tree.

As conditions change, it is the responsibility of the property owners to schedule additional site visits by the necessary professionals to ensure that the long-term success of the project is ensured. It is the responsibility of the property owner to obtain all required permits from city, county, state, or federal agencies. It is the responsibility of the property owner to comply with all applicable laws, regulations, and permit conditions. If there is a homeowners association, it is the responsibility of the property owner to comply with all Codes, Covenants, and Restrictions (CC&R's) that apply to tree pruning and tree removal.

This tree evaluation is to be used to inform and guide the client in the management of their trees. This in no way implies that the evaluator is responsible for performing recommended actions or using other methods or tools to further determine the extent of internal tree problems without written authorization from the client. Furthermore, the evaluator in no way holds that the opinions and recommendations are the only actions required to insure that the tree will not fail. A second may be sought if the client feels it's necessary. The client shall hold the evaluator harmless for any and all injuries or damages incurred if the tree examined fails for any reason or if the evaluator's recommendations are not followed or for acts of nature beyond the evaluator's reasonable expectations, such as severe winds, excessive rains, heavy snow loads, etc.

Should you have any questions or concerns, or if I may be of further assistance, please call. Sincerely,



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GLOSSARY

Terms Used in This Report, on the Tree Condition and Their Significance

In an effort to clearly present the information for each tree in a manner that facilitates the reader's ability to understand the conclusions I have drawn for each tree, I have collected the information in a report format. This report was developed by Jordan Blonski and it is based upon the Tree Risk Assessment in Urban Areas and the Urban/Rural Interface course manual and the Tree Risk Assessment Form, both sponsored by the International Society of Arboriculture, and the Hazard Tree Evaluation Form from the book, *The Evaluation of Hazard Trees in Urban Areas*, by Matheny and Clarke. The descriptions were left brief in the report in an effort to include as much pertinent information as possible, to make the report manageable, and to avoid boring the reader with infinite levels of detail. However, a review of these terms and descriptions will allow the reader to rapidly move through the report and understand the information.

- 1) **TREE LOCATION**—indicates what general area of the site the tree is on, or whether the tree is Off the Project property.
- 2) **TREE #**—the individual number of each tree.
- 3) **SPECIES**—this describes the species of each tree with both most readily accepted common name and the officially accepted scientific name.
- 4) **DBH**—Diameter-at-Breast-Height. This is the standard measurement of trees taken at 4.5 feet above the average ground level of the tree base.
 - I. Occasionally it is not practical to measure a tree at 4.5 feet above the ground. The most representative area of the trunk near 4.5 feet is then measured and noted on the spreadsheet. For instance, a tree that forks at 4.5 feet can have an unusually large swelling at that point. The measurement is taken below the swelling and noted as, '28.4" at 36"'.
 - II. Trees with multiple stems are listed as a "clump of x," with x being the number of trunks in the clump. Measurements may be given as an average of all the trunks, or individual measurements for each trunk may be listed.
 - III. Every effort is made to distinguish between a single tree with multiple stems and several trees growing close together at the bases.
- 5) **DRIP LINE**—the radius, the distance from the trunk to the furthest branch tips (sometimes the average of these measurements around the tree).
- 6) **% LCR**—Percentage of Live Crown Ratio: the relative proportion of green crown to overall tree height. This is an important indication of a tree's health. If a tree has a high percentage of Live Crown Ratio, it is likely producing enough photosynthetic activity to support the tree. If a tree has less than 30 to 40% LCR it can create a shortage of needed energy and can indicate poor health and vigor.

7) **SYMMETRY**—is the description of the form of the canopy. That is, the balance or overall shape of the canopy and crown. This is the place I list any major defects in the tree shape—does the tree have all its foliage on one side or in one unusual area.

Symmetry can be important if there are additional defects in the tree such as rot pockets, cracks, loose roots, weak crown etc.

Symmetry is generally categorized as Generally Symmetrical, Minor Asymmetry or Major Asymmetry:

- I. Gen. Sym.—Generally Symmetrical. The canopy/foliage is generally even on all sides with spacing of scaffold branches typical for the species, both vertically and radially.
- II. Min. Asym.—Minor Asymmetry. The canopy/foliage has a slightly irregular shape with more weight on one side but appears to be no problem for the tree.
- III. Maj. Asym.—Major Asymmetry. The canopy/foliage has a highly irregular shape for the species with the majority of the weight on one side of the tree. This can have a significant impact on the tree's stability, health and hazard potential—especially if other defects are noted such as cracks, rot, root defects.

8) **FOLIAGE/BRANCH**—describes the foliage of the tree in relation to a perfect specimen of that particular species. First the branch growth and foliage density is described, and then any signs or symptoms of stress and/or disease are noted. The condition of the foliage, or the branches and buds for deciduous trees in the dormant season, are important indications of a tree's health and vigor.

- I. For Deciduous trees in the dormant season:
 - The structure of the tree is visible.
 - The quantity and quality of buds indicates health, and is described as good bud set, average bud set, or poor bud set. These are abbreviated in the spreadsheet as: gbs, abs, or pbs.
 - The amount of annual shoot elongation is visible and is another major indication of tree health and vigor. This is described as: a) Excellent, Good, Average, or Short Shoot Elongation. These are abbreviated in the spreadsheet as ESE, GSE, ASE, OR SSE. ii)
- II. For evergreen trees year round and deciduous trees in leaf, the color and density of the foliage indicates if the tree is healthy or stressed, or if an insect infestation, a bacterial, fungal, or viral infection is present. Foliage is categorized on a scale from:
 - Dense—extremely thick foliage, an indication of healthy vigorous growth,
 - Good—thick foliage, thicker than average for the species,
 - Normal/Average—thick foliage, average for the species, an indication of healthy growth,
 - Thin or Thinning—needles and leaves becoming less dense so that sunlight readily passes through; an indication that the tree is under serious stress that could impact the long-term survivability and safety of the tree,
 - Sparse—few leaves or needles on the twigs, an indication that the tree is under extreme stress and could indicate the future death of the tree
 - Necrosis—the presence of dead twigs and branchlets. This is another significant indication of tree health. A few dead twigs and branches are reasonably typical in most trees of size. However, if there are dead twigs and branchlets all over a certain portion of the tree, or all over the tree, these are indications of stress or attack that can have an impact on the tree's long-term health.
 - Hangers—a term to describe a large branch or limb that has broken off but is still hanging up in the tree. These can be particularly dangerous in adverse weather conditions.

9) **CROWN CONDITION**—the crown is uppermost portion of the tree, generally considered the top 10 to 20% of the canopy or that part of the canopy above the main trunk in deciduous trees and above the secondary bark in evergreen trees.

- I. The condition of the tree's crown is a reflection of the overall health and vigor of the entire tree. The crown is one of the first places a tree will demonstrate stress and pathogenic attack such as root rot.
- II. If the Crown Condition is healthy and strong, this is a good sign. If the crown condition is weak, broken out, or shows other signs of decline, it is an indication that the tree is under stress. It is such an important indication of health and vigor that this is the first place a trained forester or arborist looks to begin the evaluation of a tree. Current research reveals that, by the time trees with root rot show significant signs of decline in the crown, fully 50% or more of the roots have already rotted away. Crown Condition can be described as:
 - A. Healthy Crown—exceptional growth for the species.
 - B. Average Crown—typical for the species.
 - C. Weak Crown—thin spindly growth with thin or sparse needles.
 - D. Flagging Crown—describes a tree crown that is weak and unable to grow straight up.
 - E. Dying Crown—describes obvious decline that is nearing death.
 - F. Dead Crown—the crown has died due to pathological or physical injury. The tree is considered to have significant stress and/or weakness if the crown is dead.
 - G. Broken out—a formerly weak crown condition that has been broken off by adverse weather conditions or other mechanical means.
 - H. Regenerated or Regenerating—formerly broken out crowns that are now growing back, Regenerating crowns may appear healthy, average, or weak and indicate current health of the tree.
 - I. Suppressed—a term used to describe poor condition of an entire tree or just the crown. Suppressed crowns are those that are entirely below the general level of the canopy of surrounding trees which receive no direct sunlight. They are generally in poor health and vigor. Suppressed trees are generally trees that are smaller and growing in the shade of larger trees around them. They generally have thin or sparse needles, weak or missing crowns, and are prone to insect attack as well as bacterial and fungal infections.

10) **TRUNK**—this is the area to note any defects that can have an impact on the tree's stability or hazard potential. Typical things noted are:

- I. FORKED—bifurcation of branches or trunks that often occur at a narrow angle.
- II. INCLUDED BARK—a pattern of development at branch or trunk junctions where bark is turned inward rather than pushed out. This can be a serious structural defect in a tree that can and often does lead to failure of one or more of the branches or trunks especially during severe adverse weather conditions.
- III. EPICORMIC GROWTH—this is generally seen as dense thick growth near the trunk of a tree. Although this looks like a healthy condition, it is in fact the opposite. Trees with Epicormic Growth have used their reserve stores of energy in a last ditch effort to produce enough additional photosynthetic surface area to produce more sugars, starches and carbohydrates to support the continued growth of the tree. Generally speaking, when conifers in the Pacific Northwest exhibit heavy amounts of Epicormic Growth, they are not producing enough food to support their current mass and are already in serious decline.
- IV. INTERNAL STRUCTURAL WEAKNESS—a physical characteristic of the tree trunk, such as a kink, crack, rot pocket, or rot column that predisposes the tree trunk to failure at the point of greatest weakness.
- V. BOWED—a gradual curve of the trunk. This can indicate an Internal Structural Weakness or an overall weak tree. It can also indicate slow movement of soils or historic damage of the tree that has been corrected by the curved growth.
- VI. KINKED—a sharp angle in the tree trunk that indicates that the normal growth pattern is disrupted. Generally this means that the internal fibers and annual rings are weaker than straight trunks and prone to failure, especially in adverse weather conditions.

VII. GROUND FLOWER—an area of deformed bark near the base of a tree trunk that indicates long-term root rot.

11) **ROOT COLLAR**—this is the area where the trunk enters the soil and the buttress roots flare out away from the trunk into the soil. It is here that signs of rot, decay, insect infestation, or fungal or bacterial infection are noted. **NAD** stands for **No Apparent Defects**.

12) **ROOTS**—any abnormalities such as girdling roots, roots that wrap around the tree itself that strangle the cambium layer and kill the tree, are noted here.

13) **COMMENTS**—this is the area to note any additional information that would not fit in the previous boxes or attributes about the tree that have bearing on the health and structure of the tree.

14) **CURRENT HEALTH RATING**—A description of the tree's general health ranging from dead, dying, poor, senescent, suppressed, fair, good, very good, to excellent.

15) **PNW-ISA TREE RISK ASSESSMENT RATINGS FOR HAZARD POTENTIAL**--The Pacific Northwest Chapter of the International Society of Arboriculture now certifies arborists as Certified Tree Risk Assessors using an adjusted scale Low to Extreme. They are:

- I. **TARGET RATING**--A scale of zero to three points depending upon the amount of use within the range of the tree and the amount of injury or damage that might occur if the tree or component part does fail. Target is both the level of use and the quality/value of the target combined with the foreseeable amount of injury or damage that will likely occur should the tree or component part fail.
 - o 0 Points, no target. No Hazard.
 - o 1 Point, Low human use is rare and random for short periods of time and/or low target value. (country roads, long-term or overflow parking, remote parks, wilderness trails)
 - o 2 Points, Moderate human use less than 50% time, occasional (any given time) and/or moderate target value. (picnic areas, camping areas, minor rural roads, moderate use trails)
 - o 3 Points, Moderately high human use more than 50% of the time, frequent or high value target and/or moderate target value. (bus stops, roads, parking areas, most rarely used vacation homes, playgrounds, etc.)
 - o 4 Points, High or constant human use and/or high target value. (Schools, hospitals, residential and family homes, utilities, visitor centers, emergency access roads and stations)
- II. **SIZE OF PART**-- The larger the tree or component part that fails, the greater the potential for injury or damage.
- III. **PROBABILITY OF FAILURE**--This component ranks the likelihood that the observed defect(s) will fail in a reasonable amount of time in the foreseeable future. The probability of failure automatically has associated with its threshold of action recommended to reduce or minimize the potential failure and associated injuries or damages that might occur.

16) **ISA HAZARD or RISK RATING**--The combined component ratings used within a specific Matrix.

17) **Recommendation**— This is an estimate of whether or not the tree is of sufficient health, vigor and structure that is worth retaining. Specific recommendations for each tree are included in this column. They may include anything from pruning deadwood, mulching, aerating, injecting tree-based fertilizers into the root system, shortening into a habitat snag, or to completely remove the tree.

- I. Potential to retain with tree protection measures: means that the tree appears to have the internal resources, the health and vigor, structural stability, and the wind firmness to be able to withstand stresses of construction if development requirements and construction requirements.
- II. Remove or remove for safety means that the tree has a high potential to fail and has the potential to cause either personal injury or property damage. If it is at all possible the recommendation is to leave some of the trunk standing for wildlife habitat, some of the trunk on the ground as a nurse log, and some of the canopy in a brush pile. These are 3 key elements in retention of desirable/suburban wildlife such as songbirds. Remove or remove for safety means that the tree has a high potential to fail and has the potential to cause either personal injury or property damage. If it is at all possible the recommendation is to leave some of the trunk standing for wildlife habitat, some of the trunk on the ground as a nurse log, and some of the canopy in a brush pile. These are 3 key elements in retention of desirable/suburban wildlife such as songbirds.
 - The height of the standing habitat tree depends upon the size of the tree the condition of the tree and the distance to a probable target it should be short enough so that when it does fail years in the future it will not cause personal injury or property damage.
 - Nurse logs can be laid horizontally across the slope to aid with erosion control and to provide micro environments for new plantings. The nurse logs may need to be staked in place to prevent their movement and potential harm to people. If for some reason this is not possible that should be removed for safety.
 - Brush piles can be complex or simple. They provide important sites for cover from predators, nesting and many other benefits

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