

**2020**

**Zsofia Pasztor**



**TREE EVALUATION JANUARY 2020**

# Tree Evaluation January 2020

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**Zsofia Pasztor**

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**Arborist PN-5795A, Tree Risk Assessor Qualified**

**Landscape Designer; Certified LID Consultant**

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Dear Mr. Smith,

On January 10<sup>th</sup> 2020, at your request, I performed a complete tree inventory and level 2 evaluation at Sunnyside Co-Housing in Marysville WA.

This report is a summary of my observations and conclusions.

## **Definition of the assignment**

You contacted me because you are planning to develop the property. You asked for an evaluation and a summary completed by a Tree Risk Assessor Arborist.

As you and I discussed, my assignment was to:

- evaluate the health and condition of the trees at this time
- determine if preservation is possible
- write and submit to you a report

## **Summary of findings**

Visiting the site and examining the trees on the property I found that many of the trees are in poor condition. The pines and alders on the site are declining, largely because they are growing too close to one another.

The site has a total of 111 significant trees. The site was logged before, the new trees are natural sprouts and ornamental plantings. The soil conditions vary during the year depending on the season and precipitation. During the rainy season the water table is close to the surface a 10” or less in some of the areas. The site has sections where the soil dries out faster because it is slightly higher than the rest of the space. Water is running into the site during rains and most of winter as the E edge of the lot is designated wetland. The soil seems to be our typical glacial till, lose rocks in gravely sand and clay mixed or alternating randomly. Drainage is decent, observed by the gardeners during the dry months in most areas outside the wetland. The site has been used as pasture in the past and based on the existing grass and weed vegetation it has enough organic matter to maintain a typical Puget Sound pasture flora. The presence of buttercup and small fruited bullrush clumps in the lower spots indicate high levels of watertable but as observed during the past seasons, the soil drains well even in these areas once the rains stop.

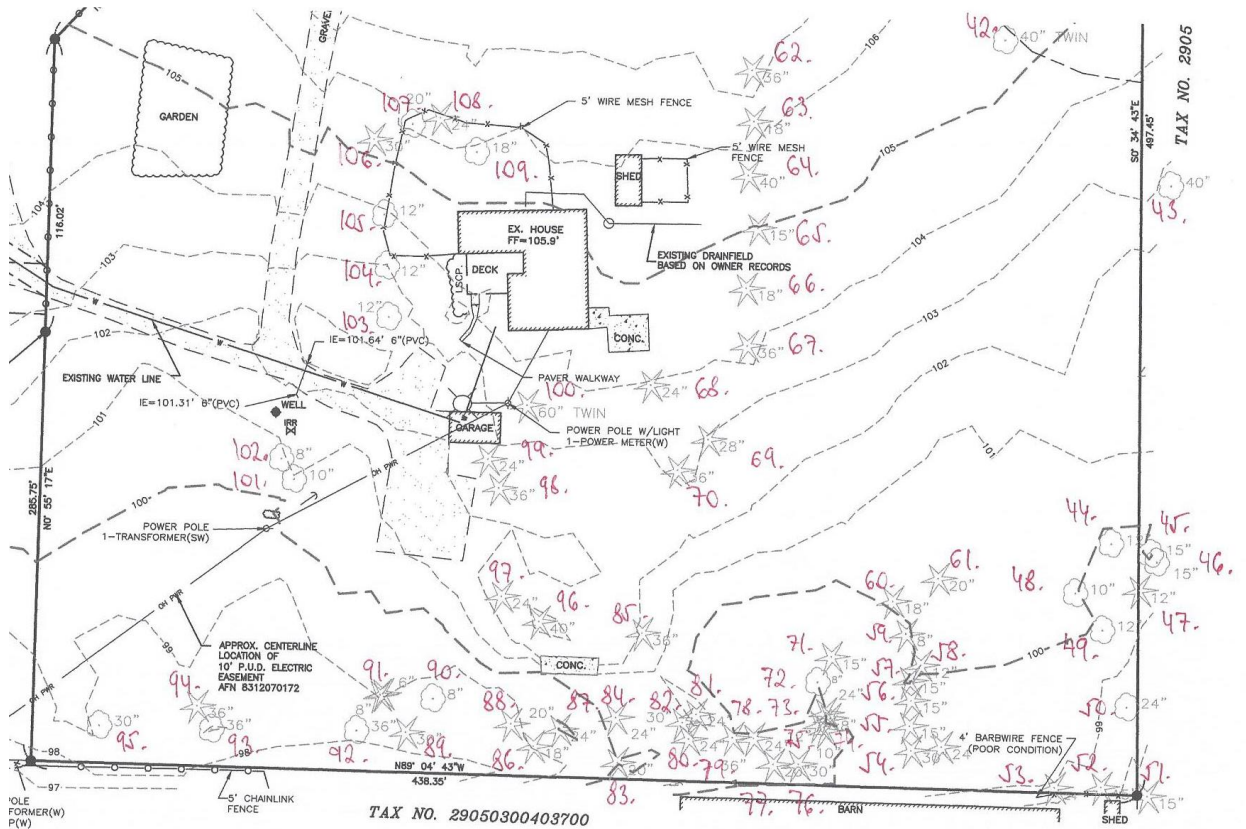
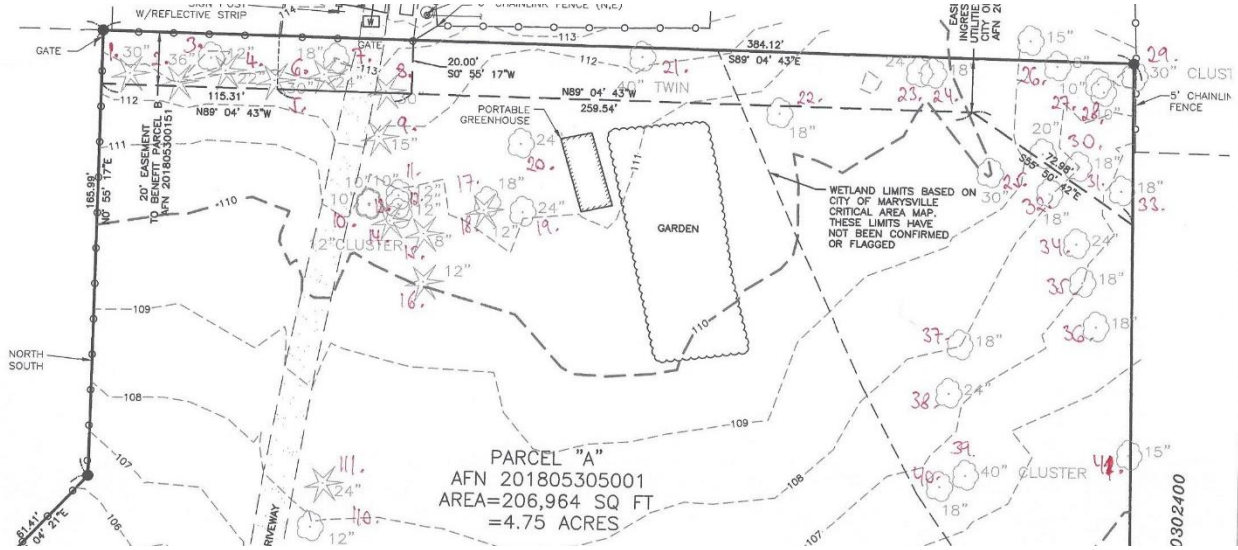
## **Methodology**

To evaluate the trees and to prepare the report, I drew upon my 30 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

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(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 and other abnormalities.



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### Field Data

#	Species	DBH inches	Root Protection Area feet	Health	Notes
1	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Fair	Might need to be removed when road is widened
2	<i>Pseudotsuga menziesii</i> Douglas Fir	36	25	Fair	Might need to be removed when road is widened
3	<i>Populus nigra</i>	12	8	Fair	Might need to be removed when road is widened
4	<i>Pseudotsuga menziesii</i> Douglas Fir	22	14	Fair	Might need to be removed when road is widened
5	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Fair	Might need to be removed when road is widened
6	<i>Pseudotsuga menziesii</i> Douglas Fir	24	16	Fair	Might need to be removed when road is widened
7	<i>Populus nigra</i> Lombardi Poplar	18	11	Fair	Might need to be removed when road is widened
8	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Fair	Might need to be removed when road is widened
9	<i>Thuja plicata</i> Western Red Cedar	15	10	Fair	Might need to be removed when road is widened
10	<i>Alnus oregona</i> Red Alder	3 trunks 10" each	21	Poor	Might need to be removed when road is widened
11	<i>Alnus oregona</i> Red Alder	12	8	Poor	Might need to be removed when road is widened
12	<i>Alnus oregona</i> Red Alder	12	8	Poor	Might need to be removed when road is widened
13	<i>Alnus oregona</i> Red Alder	12	8	Poor	Might need to be removed when road is widened
14	<i>Thuja plicata</i> Western Red Cedar	12	8	Fair	Might need to be removed when road is widened
15	<i>Thuja plicata</i> Western Red Cedar	8	6	Fair	Might need to be removed when road is widened
16	<i>Thuja plicata</i> Western Red Cedar	12	8	Fair	Might need to be removed when road is widened
17	<i>Populus nigra</i> Lombardi Poplar	18	11	Fair	
18	<i>Thuja plicata</i> Western Red Cedar	12	8	Fair	
19	<i>Populus nigra</i> Lombardi Poplar	24	15	Fair	
20	<i>Populus nigra</i> Lombardi Poplar	24	15	Fair	
21	<i>Alnus oregona</i> Red Alder	2 trunks 20" each	28	Poor	
22	<i>Alnus oregona</i> Red Alder	18	12	Poor	

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2 3	<i>Alnus oregona</i> Red Alder	24	15	Poor	In wetland
2 4	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
2 5	<i>Alnus oregona</i> Red Alder	30	21	Poor	In wetland
2 6	<i>Alnus oregona</i> Red Alder	8	5	Poor	In wetland
2 7	<i>Alnus oregona</i> Red Alder	10	7	Poor	In wetland
2 8	<i>Alnus oregona</i> Red Alder	10	7	Poor	In wetland
2 9	<i>Alnus oregona</i> Red Alder	30	21	Poor	In wetland; on property line
3 0	<i>Alnus oregona</i> Red Alder	20	14	Poor	In wetland
3 1	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
3 2	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
3 3	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
3 4	<i>Alnus oregona</i> Red Alder	24	15	Poor	In wetland
3 5	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
3 6	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
3 7	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
3 8	<i>Alnus oregona</i> Red Alder	24	15	Poor	In wetland
3 9	<i>Alnus oregona</i> Red Alder	40	28	Poor	In wetland; many trunks
4 0	<i>Alnus oregona</i> Red Alder	18	12	Poor	In wetland
4 1	<i>Alnus oregona</i> Red Alder	15	10	Poor	In wetland; on property line
4 2	<i>Acer macrophyllum</i> Bigleaf Maple	2 trunks 20" each	28	Poor	In wetland edge
4 3	<i>Alnus oregona</i> Red Alder	40	28	Poor	In wetland; on property line
4 4	<i>Alnus oregona</i> Red Alder	12	8	Poor	In wetland
4 5	<i>Alnus oregona</i> Red Alder	15	10	Poor	In wetland; on property line
4 6	<i>Alnus oregona</i> Red Alder	15	10	Poor	In wetland; on property line
4 7	<i>Pseudotsuga menziesii</i> Douglas Fir	15	10	Poor	In wetland; on property line
4 8	<i>Alnus oregona</i> Red Alder	10	7	Poor	In wetland

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4 9	<i>Alnus oregona</i> Red Alder	12	8	Poor	In wetland
5 0	<i>Alnus oregona</i> Red Alder	24	15	Poor	In wetland
5 1	<i>Pseudotsuga menziesii</i> Douglas Fir	15	10	Poor	In wetland; on property line; English ivy
5 2	<i>Pseudotsuga menziesii</i> Douglas Fir	15	10	Poor	In wetland; on property line; English ivy In wetland; on property line
5 3	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Poor	In wetland; on property line; English ivy In wetland; on property line
5 4	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Poor	In wetland; English ivy; 24" tree next to it looks as they are from one base
5 5	<i>Pinus ponderosa</i> Ponderosa Pine	15	10	Poor	In wetland, struggling, several blew down already in recent past, not suitable for the site
5 6	<i>Pinus ponderosa</i> Ponderosa Pine	15	10	Poor	In wetland, struggling, several blew down already in recent past, not suitable for the site
5 7	<i>Pinus ponderosa</i> Ponderosa Pine	15	10	Poor	In wetland, struggling, several blew down already in recent past, not suitable for the site
5 8	<i>Pinus ponderosa</i> Ponderosa Pine	12	8	Poor	In wetland, struggling, several blew down already in recent past, not suitable for the site
5 9	<i>Pinus ponderosa</i> Ponderosa Pine	8	5	Poor	In wetland, struggling, several blew down already in recent past, not suitable for the site
6 0	<i>Pinus ponderosa</i> Ponderosa Pine	18	12	Poor	Edge of wetland, struggling, several blew down already in recent past, not suitable for the site
6 1	<i>Xanthocyparis nootkatensis</i> Yellow Cedar	20	21	Good	Planting more would be a good choice for the replanting
6 2	<i>Picea pungens</i> Colorado Spruce	36	24		Removed, was in very poor condition
6 3	<i>Picea pungens</i> Colorado Spruce	18	12	Very poor	Mites and stress, not suitable for the site
6 4	<i>Pinus thurbergii</i> Japanese Black Pine	40	28	Poor	Crowded, near drain field, stressed, not suitable for the site
6 5	<i>Pinus ponderosa</i> Ponderosa Pine	15	10	Poor	Crowded, near drain field, stressed, not suitable for the site
6 6	<i>Pinus ponderosa</i> Ponderosa Pine	18	12	Poor	Crowded, near drain field, stressed, not suitable for the site
6 7	<i>Pseudotsuga menziesii</i> Douglas Fir	36	24	Fair	
6 8	<i>Pseudotsuga menziesii</i> Douglas Fir	28	20	Fair	
6 9	<i>Pseudotsuga menziesii</i> Douglas Fir	36	24	Fair	
7 0	<i>Pseudotsuga menziesii</i> Douglas Fir	10	10	Fair	
7 1	<i>Pinus ponderosa</i> Ponderosa Pine	15	10	Poor	Crowded, stressed, not suitable for the site
7 2	<i>Alnus oregona</i> Red Alder	8	5	Very poor	Crowded
7 3	<i>Pinus ponderosa</i> Ponderosa Pine	24	15	Poor	Crowded, stressed, not suitable for the site
7 4	<i>Pinus ponderosa</i> Ponderosa Pine	18	12	Poor	Crowded, stressed, not suitable for the site

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7 5	<i>Pinus ponderosa</i> Ponderosa Pine	12 and 10	15	Poor	Crowded, stressed, not suitable for the site
7 6	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Poor	English Ivy
7 7	<i>Pseudotsuga menziesii</i> Douglas Fir	20	14	Poor	English Ivy
7 8	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Poor	
7 9	<i>Pseudotsuga menziesii</i> Douglas Fir	36	24	Poor	
8 0	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Poor	English Ivy
8 1	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Poor	English Ivy
8 2	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Poor	English Ivy
8 3	<i>Pseudotsuga menziesii</i> Douglas Fir	20	14	Poor	
8 4	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Poor	English Ivy
8 5	<i>Pseudotsuga menziesii</i> Douglas Fir	36	24	Fair	
8 6	<i>Pinus ponderosa</i> Ponderosa Pine	18	12	Poor	Crowded, stressed, not suitable for the site
8 7	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Poor	
8 8	<i>Pinus ponderosa</i> Ponderosa Pine	18	12	Poor	Crowded, stressed, not suitable for the site
8 9	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Fair	
9 0	<i>Betula pendula</i> White Birch	8	5	Poor	Some birch borer signs, sapsucker holes, monitor
9 1	<i>Thuja plicata</i> . Western Red Cedar	2 trunks 6" and 8"	7	Poor	
9 2	<i>Alnus oregona</i> Red Alder	36	24	Poor	Over-mature
9 3	<i>Populus nigra</i> Lombardi Poplar	36	24	Fair	
9 4	<i>Pseudotsuga menziesii</i> Douglas Fir	36	24	Fair	
9 5	<i>Populus nigra</i> Lombardi Poplar	30	21	Fair	
9 6	<i>Pseudotsuga menziesii</i> Douglas Fir	40	28	Fair	
9 7	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Fair	
9 8	<i>Pseudotsuga menziesii</i> Douglas Fir	36	24	Fair	
9 9	<i>Pseudotsuga menziesii</i> Douglas Fir	24	15	Fair	

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100	<i>Chamaecyparis lawsoniana</i> Lawson Cypress	60	42	Fair	
101	<i>Prunus sp.</i> Plum	10	7	Very poor	
102	<i>Prunus sp.</i> Cherry	10	7	Very poor	
103	<i>Malus sp.</i> Apple	12	8	Poor	
104	<i>Malus sp.</i> Apple	12	8	Poor	
105	<i>Malus sp.</i> Apple	12	8	Poor	
106	<i>Pseudotsuga menziesii</i> Douglas Fir	30	21	Fair	A very nice leaf formation with a whirling pattern
107	<i>Juglans sp.</i> Nut	20	14	Poor	
108	<i>Tsuga heterophylla</i> Western Hemlock	24	15	Fair	
109	<i>Acer sp?</i>	18	12	Fair	No visible defect, difficult to tell what kind of tree, too much undergrowth and crowded crown, seasonal no foliage
110	<i>Populus nigra</i> Lombardi Poplar	12	8	Fair	
111	<i>Pinus Sylvestris</i> Scott's Pine	24	15	Fair	

In order to plant new trees and to support the retained ones, the soil should be amended within each tree's root area with compost. Rather than tilling around existing trees, a layer of 2 inches of compost should be placed and covered with a layer of 3-4 inches deep woodchips. The compost and woody mulch layers should be kept from touching the trunks of any of the trees. Watering during drought periods would help the trees and the soil around them as well.

Many of the trees within the pine area are leaning, about to fall or already fell. Some are dying, others are dead. Roots are exposed on almost all of the trees growing on the edges. The trees need to be protected and a fence of temporary chain link needs to be placed for the duration of the construction. The fence should be placed at the tree root zone as it is listed above for each tree.



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## 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 the level 2 system to examine these trees, this evaluation represents my opinion of the tree health only 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 maybe sought if 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,



Zsafia Pasztor;  
Certified Horticulturist Cert. # 2459  
Certified Arborist Cert. # PN5795A;  
Certified Tree Risk Assessor Cert. # 480  
Certified LID Consultant and Designer  
Landscape Designer and Construction Consultant



## ATTACHMENT 1 – 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 Zsofia Pasztor 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.

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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) 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

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- 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:

- Healthy Crown—exceptional growth for the species.
- Average Crown—typical for the species.
- Weak Crown—thin spindly growth with thin or sparse needles.
- Flagging Crown—describes a tree crown that is weak and unable to grow straight up.
- Dying Crown—describes obvious decline that is nearing death.
- 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.
- Broken out—a formerly weak crown condition that has been broken off by adverse weather conditions or other mechanical means.
- 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.
- 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:

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- 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.

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- 0 Points, no target. **No Hazard.**
- 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)
- 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)
- 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.)
- 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 it threshold of action recommended to reduce or minimize the potential failure and associated injuries or damages that might occur.

iiii) **CONSEQUENCES**

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 it is worth retaining. Specific recommendations for each tree are included in this column. They may include anything from pruning dead wood, mulching, aerating, injecting tree-based fertilizer into the root system, shortening into a habitat tree or wildlife snag, or to completely removing the tree.

i) **Monitor:** “Monitor” is a specific recommendation that the tree be reevaluated on a routine basis to determine if there are any significant changes in health or structural stability. “Monitor annually” (or bi-annually, triannually, etc.)” means the tree should be looked at once every year (or every 2 or 3 years, etc.) This yearly monitoring can be a quick look at the trees to see if there are any significant changes. Significant changes such as storm damage, loss of crown, partial failure of one or more roots, etc. require that a full evaluation be done of the tree at that time.



## ATTACHMENT 2– REFERENCES

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