City of Oregon City, 406 Bluff Street
Maple Tree Risk Assessment | 2020

Prepared for:

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Prepared by:

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Summary

On June 17, 2020 the City of Oregon City, through Jonathan Waverly, agreed to the recommendation of completing a *Level 2 Basic tree risk assessment* on one bigleaf maple tree (*Acer macrophyllum*) at 406 Bluff St. to determine tree risk to the house, vehicles, and pedestrians. The result of the project would be a written report describing our observations, findings, and recommendations. The initial concern of the City was the tree's decreased vigor.

Bartlett Tree Experts (BTE or Bartlett) concluded that the *overall risk rating* for the subject tree was ***moderate*** due to the ***occupancy rate*** of potential ***targets***.

Bartlett recommended that removal be performed to eliminate risk associated with the tree due to its poor health and apparent impending demise.

If the client considers any tree to be hazardous and representing an immediate safety concern, access to the tree could be restricted. The area could be blocked off by placing a sign, tape, or other warning device near the tree until such time as the hazard can be remedied.

Introduction

Background

The Bluff St. property was located in Oregon City, OR. The subject tree was located at the front of the property. The City wanted a tree risk assessment to help determine future management.

The City agreed to the recommendation of completing a *Level 2 Basic tree risk assessment* on one bigleaf maple tree (*Acer macrophyllum*) at 406 Bluff St. to determine tree risk to pedestrians, vehicles, and the house on the property. The result of the project would be a written report describing our observations, findings, and recommendations. Regional Inventory Arborist Sean Rinault was assigned to conduct the assessments.

Assignment

After discussing the trees with the City, it was agreed that my assignment was to:

1. Provide a *Level 2 Basic tree risk assessment* as defined in the *International Society of Arboriculture's (ISA) Best Management Practices for Tree Risk Assessment* and *ANSI A300 Tree Risk Assessment Standard* for one tree located at the front of the property in order to assist with tree management. The assessments would be performed by walking completely around the tree and evaluating the site, **buttress roots** (if visible), **trunk**, and **branches** utilizing tools such as a mallet. Bartlett Tree Experts personnel would perform the assessment from the ground
2. Submit a written report including:
    a. Written summary of procedures used in risk assessment
    b. Map or detailed description of tree locations
    c. Detailed description of the designated subject tree which the *Level 2 Basic assessment* was performed on including:
        i. Tree species (both common and botanical name)
        ii. Condition
        iii. Diameter at breast height (DBH)
        iv. Description of observed defects
        v. *Overall Tree Risk Rating*
        vi. Risk mitigation recommendations
        vii. Residual *Overall Tree Risk Rating*

Limits of Assignment

The assessment was based on a single site visit and visual assessment from the ground. Assessment was made of the designated tree on June 30, 2020. Photographs of the site and subject tree were taken on the day the evaluation was performed. *Targets* were assessed based on estimated normal *occupancy rates* and usage for the site. Risk assessments are typically considered over a three year period.

It must be emphasized that all trees pose a certain degree of inherent risk and this evaluation does not preclude all possibility of ***failure***, especially during storms. For any tree that the client considers hazardous and representing an immediate safety concern, we recommend that the area around the tree be physically blocked off. The area could be blocked off by placing a sign, tape, or other warning device near the tree until such time as the hazard can be mitigated.

Tree risk assessment has a unique set of terms with specific meanings. Definitions of all specific terms may be found in the *International Society of Arboriculture's Best Management Practice for Tree Risk Assessment* (Smiley *et al.* 2011). Definitions of some of these terms used in this report are as follows:

The *likelihood of failure* may be categorized as ***imminent*** meaning that failure has started or could occur at any time; ***probable*** meaning that failure may be expected under normal weather conditions within the next three years; ***possible*** meaning that failure could occur, but is unlikely under normal weather conditions during that time frame; and ***improbable*** meaning that failure is not likely under normal weather conditions, and may not occur in severe weather conditions during that time frame.

The *likelihood of the failed tree part impacting a target* may be categorized as ***high*** meaning that a failed tree or tree part will most likely impact a target; ***medium*** meaning that a failed tree or tree part may or may not impact a target with equal ***likelihood; low*** meaning that the failed tree or tree part is not likely to impact a target; and ***very low*** meaning that the chance of a failed tree or tree part impacting the target is remote.

The *Likelihood of Failure and Impact* is defined by Table 1, the Likelihood Matrix:

Table 1: LIKELIHOOD OF FAILURE AND IMPACT

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impact			
	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

The ***consequences*** of a known target being struck may be categorized as ***severe*** meaning that impact could involve serious personal injury or death, damage to high value property, or disruption to important activities; ***significant*** meaning that the impact may involve personal injury, property damage of moderate to high value, or considerable disruption; ***minor*** meaning that impact could cause low to moderate property damage, small disruptions to traffic or a communication utility, or minor injury; and ***negligible*** meaning that impact may involve low value property damage, disruption that can be replaced or repaired, and does not involve personal injury.

Levels of assessment 1) *Limited visual assessments* are conducted to identify obvious defects. 2) *Basic assessments* are visual inspections done by walking around the tree looking at the site, buttress roots, trunk and branches. It may include the use of simple tools to gain information about the tree or defects. 3) *Advanced assessments* are performed to provide detailed information about specific tree parts, defects, targets of site conditions. Drilling to detect decay is an *advanced assessment* technique.

Tree Risk Ratings are terms used to communicate the level of risk rating. They are defined in Table 2, the Risk Matrix, as a combination of Likelihood and Consequences:

Table 2: ISA RISK MATRIX

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	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

Overall tree risk rating is the highest individual risk identified for the tree.

Purpose & Use of the Report

The purpose of this report was to document the assessments of the subject tree and provide information on the level of risk that the subject tree poses. This report is intended to be used by the City of Oregon City to assist in making decisions regarding the management of the subject tree located at 406 Bluff St, in Oregon City, OR.

Observations

Investigation Methods

ArborScope™, Bartlett's tree inventory management software, was utilized to record and tabulate important tree characteristics and risk ratings, and generate a map of the subject trees.

A *Level 2 Basic tree risk assessment* as defined in the *International Society of Arboriculture's (ISA) Best Management Practices for Tree Risk Assessment* (Smiley *et al.* 2011) and *ANSI A300 Tree Risk Assessment Standard* (Tree Care Industry Association 2011) was performed from the ground to evaluate the subject tree. Risk ratings were assigned following the protocol set forth in the ISA BMP (Smiley *et al*. 2011) and ANSI Standard (Tree Care Industry Association 2011). A mallet was used to **sound** the trunk and **root collar** of the tree.

Site Observations

The subject tree was located at the front of the property, in the northwest corner. The ground surrounding the site was flat out to the edge of the bluff to the west. The bluff overlooked the Willamette River. Gravel or asphalt were located within four feet of the root collar on the north, west, and south sides, with occasional vehicle traffic observed over the course of the assessment. Mulch was found piled against the trunk of the tree, with an assortment of annuals and perennials planted around it.

Assessment, Testing, and Analysis

As part of the *Level 2 Basic tree risk assessment*, four photographs were taken of the subject tree and observed tree conditions. These photographs are presented after the recommendations for the tree. The trunk and root collar were sounded with a mallet to determine if decay was present.

Findings and Risk Mitigation

Individual tree observations, testing and analysis results, risk ratings, risk mitigation recommendations, and residual risk ratings are presented with the summary for each tree assessed. Overall Discussions, Conclusions, and Recommendations are presented after the tree summary.

Tree #1

Tree #1 exhibiting advanced decline.

Observations	
Species	Bigleaf Maple (*Acer macrophyllum*)
DBH	45 inches
Height	~85 feet
Condition	Poor
Soil Conditions	Low volume Compacted
Mulch	Piled against stem
Defects	Dead branches Co-dominant leaders Uneven crown Over-extended branches Stem wound/missing bark Buried root collar
Pests	None noted
Targets considered	House, vehicles

Tree Observations

Nearly 30% of the tree's crown was already dead and defoliated, located primarily on one of the tree's three main leaders. The remainder of the crown exhibited thin, stunted foliage, and a heavy crop of seed. An area of the stem at ground level on the west side was devoid of bark. The tree appeared to be in a state of advanced decline.

Tree Risk Assessment and Conclusions

The overall risk rating for Tree #1 was ***moderate***.

Plant Part of Concern	Target	Likelihood of Failure	Likelihood of Impact	Consequences	Risk Rating
Branches	House Vehicles	Probable	Medium	Significant	Moderate
Stem	House Vehicles	Possible	Low	Severe	Low
Roots	House Vehicles	Possible	Low	Severe	Low

Sounding the stem with a mallet did not indicate any detectable decay.

Discussion

Overall, the maple was in poor condition. Structural defects in the form of dead branches, co-dominant leaders, unbalanced crown, a buried root collar, nearly 75% of the tree's roots being under pavement or gravel that vehicles drive on, and significant tree dieback can increase the likelihood of failure. Dead branches will eventually fail, potentially striking any targets in their vicinity. A root collar that is covered by mulch, soil, or other material can lead to excess moisture retention and decay that could result in a failure of the tree's roots, if damage is severe enough. Decay at the root collar, when coupled with a dying crown, could result in a tree toppling, striking potential targets.

More important than perhaps anything else was the tree's obvious state of decline. One leader was fully dead, and the remaining two were indicating their failing health with leaves being smaller and sparser than would be expected on a healthy bigleaf maple. Additionally, the two leaders remaining alive were carrying a heavier seed crop than normal, actually surpassing the amount of foliage present in areas. Such behavior can be associated with a tree in failing health diverting its remaining resources into reproduction to ensure continuation of the species. All indications pointed to the likelihood of the tree dying outright before the assessment period of three years has elapsed.

Risk Mitigation and Residual Risk

Risk mitigation in the form of tree removal, grinding the stump, and filling in the hole would eliminate the risk for this tree.

Recommendations

Based on the assessments and conclusions, BTE recommended the following course of action regarding the subject tree at 406 Bluff St, in Oregon City:

1. Remove the tree because of its severe state of decline and low likelihood of recovery.
2. The individual(s) performing the removal should be ISA certified and follow American National Standard Institute (ANSI) A300 pruning (Tree Care Industry Association 2008) and Z133 Safety (International Society of Arboriculture 2006) standards.

Glossary

crown……..The above ground portion of the tree that bears foliage.

crown cleaning……..In pruning, the selective removal of dead, dying, diseased, and broken branches from the tree canopy (Lilly 2010).

consequences……Effects or outcome of an event which may include personal injury, property damage, or disruption of activities (Smiley *et al.* 2011).

diameter at breast height (DBH)……Height where the diameter of a tree was measured, typically at 4.5 feet from ground-level.

dripline……The outer extents of the tree canopy that extend down to the ground.

failure……Breakage of stem, branch, roots, or loss of mechanical support in the root system (Smiley *et al*. 2011).

high……A failed tree or tree part will most likely impact a target (Smiley *et al*. 2011).

imminent……Failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load. (Smiley *et al*. 2011).

improbable……The tree is not likely to fail in normal weather conditions and may not fail in severe weather conditions within the specified period of three years (Smiley *et al.* 2011).

likelihood……The chance of an event occurring including the chance of tree failure, chance of a target being impacted, and the combination of failure and impacting a target (Smiley *et al.* 2011).

live crown ratio……The size of a tree's canopy relative to its overall height (Harris *et al*. 1999).

load……General term used to indicate the magnitude of a force or pressure applied to an object (Lilly 2010).

low……A failed tree or tree part is not likely to impact a target (Smiley *et al*. 2011).

medium……A failed tree or tree part may or may not impact a target (Smiley *et al*. 2011).

minor……Impact could cause low to moderate property damage, small disruptions to traffic or a communication utility, or minor injury (Smiley *et al*. 2011).

negligible……Impact may involve low value property damage, disruption that can be replaced or repaired, and do not involve personal injury (Smiley *et al*. 2011).

occupancy rate……Amount of time targets are within the **target zone** (Smiley *et al.* 2011).

possible.....Failure could occur, but it is unlikely during normal weather conditions within the specified time period. (Smiley *et al.* 2011).

probable.....Failure may be expected under normal weather conditions within the specified time period. (Smiley *et al.* 2011).

reduction.....Pruning to decrease height and/or spread of a branch or crown (Lily 2010).

residual risk.....Risk remaining after mitigation (Smiley *et al.* 2011).

root collar.....Area where the main roots join the plant stem (Lilly 2010).

root collar excavation.....Process of removing material that has been placed on top of the root crown of a tree to expose this area.

severe.....Impact could involve serious personal injury or death, damage to high value property, or disruption to important activities (Smiley *et al.* 2011).

significant.....Impact may involve personal injury, property damage of moderate to high value, or considerable disruption (Smiley *et al.* 2011).

sound.....A process of striking a tree with a tool or mallet to listen for tones indicating defects like cracks or cavities (Smiley *et al.* 2011).

stress.....The presence of conditions or factors that adversely affect the health and vigor of a tree.

target.....People, property, or activities that could be injured, damaged, or disrupted by a tree or tree part (Smiley *et al.* 2011).

target zone.....The area where a tree or branch is likely to land if it were to fail (Smiley *et al.* 2011).

very low.....A failed tree or tree part impacting the target is remote (Smiley *et al.* 2011).

vigor.....Overall health and capacity to grow and resist stress (Lily 2010).

Bibliography

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Lilly, S.J. 2010. *Arborists' Certification Study Guide*. International Society of Arboriculture, Champaign, IL. 352 pp.

Smiley, E.T., and B.R. Fraedrich. 1992. *Determining Strength Loss From Wood Decay*. Journal of Arboriculture 18:201-204.

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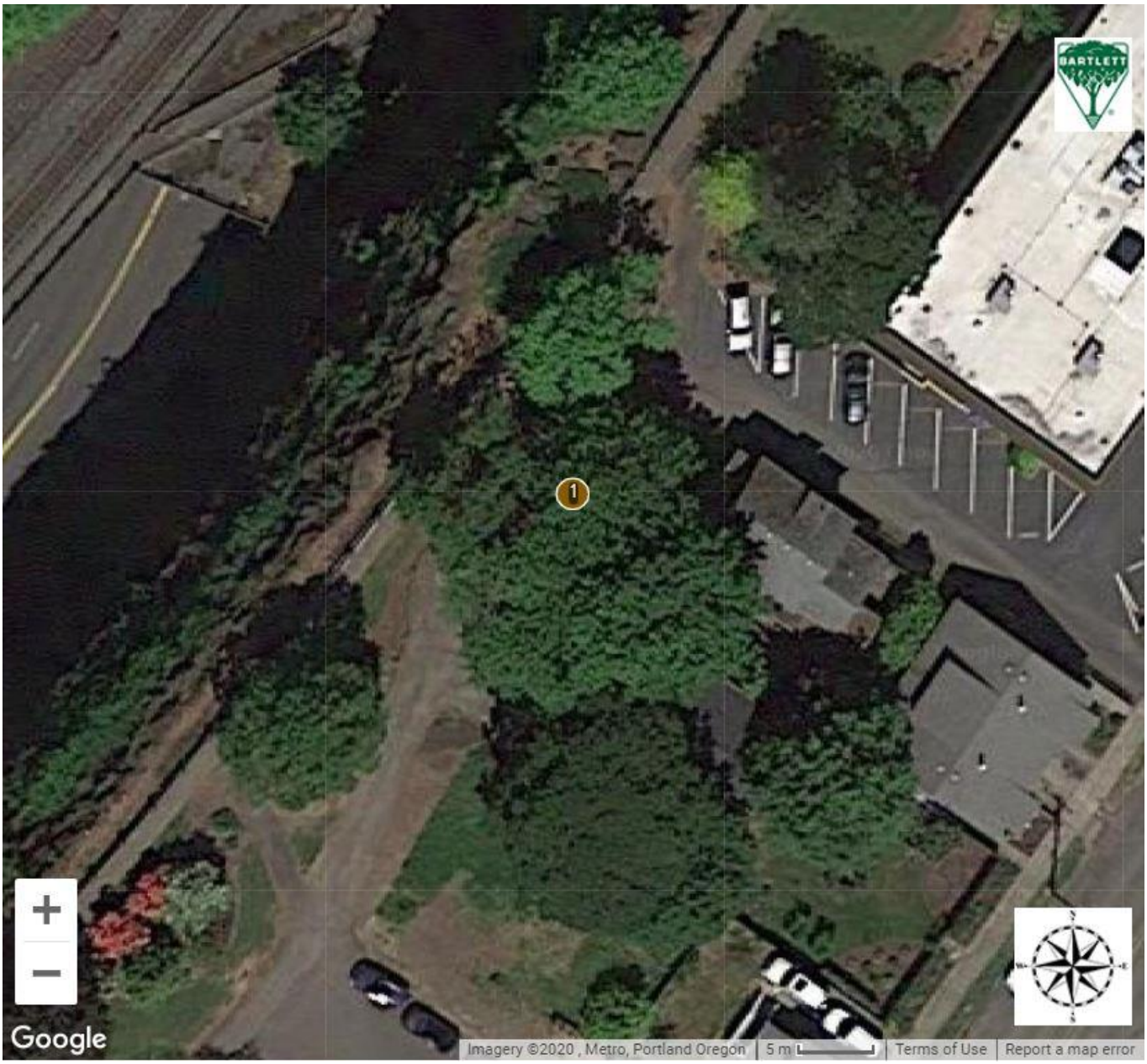
Appendix A – Site Map



Appendix B – Photographs

Tree #1 exhibiting missing bark and a buried root collar.

Tree #1 exhibiting an excessively thin canopy on the north side.

Dead and dying limbs on the south side.

Whole tree view; overall decline apparent.

Arborist Disclosure Statement

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

I, _____, acknowledge that I have received a copy of this document and that I have read and understand this disclosure statement.

*Signed:*_____
*Date:*_____

Qualifications, Assumptions, and Limiting Conditions

Any legal description provided to the arborist is assumed to be correct. Any titles or ownership of properties are assumed to be good and marketable. All property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

All property is presumed to be in conformance with applicable codes, ordinances, statutes, or other regulations.

Care has been taken to obtain information from reliable sources. However, the arborist cannot be responsible for the accuracy of information provided by others.

The arborist shall not be required to give testimony or to attend meetings, hearings, conferences, mediations, arbitrations, or trials by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.

This report and any appraisal value expressed herein represent the opinion of the arborist, and the arborist's fee is not contingent upon the reporting of a specified appraisal value, a stipulated result, or the occurrence of a subsequent event.

Figures and photographs in this report are intended for use as visual aids, are not necessarily to scale, and should not be construed as engineering or architectural reports or surveys. Inclusion of said information with any drawings or other documents does not constitute a representation of Bartlett Tree Experts as to the sufficiency or accuracy of said information.

Unless otherwise expressed: a) this report covers only the examined items and their condition at the time of inspection; and b) the inspection is limited to visual examination of accessible items. There is no warranty or guarantee, expressed or implied, that structural problems or deficiencies of plants or property may not arise in the future.

Certification of Performance

I, Sean Rinault, certify:

- That I have personally inspected the tree(s) and/or property referred to in this report, and have stated my findings accurately. The extent of the evaluation is stated in the attached report;
- That I have no current or prospective interest in the vegetation or the property that is the subject of this report and have no personal interest or bias with respect to the parties involved;
- That the analysis, opinions, and conclusions stated herein are my own;
- That my analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices;
- That no one provided significant professional assistance to the consultant, except as indicated within the report;
- That my compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party.

I am an International Society of Arboriculture Board Certified Master Arborist with a Tree Risk Assessment Qualification, and have been involved in the practice of arboriculture and the study of trees for over 21 years.

Signed: 

Date: 13 July, 2020