

Summary Memorandum

TO: Desiree Pooley, City of Tacoma
SITE: Parcel 6724200500, Salmon Beach Slope Area
RE: Site inspection and findings
DATE: December 21, 2016
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Assignment

We were asked to inspect Parcel 6724200500 (aka "Tract A"), a City-owned parcel dedicated to passive open space and a wooded slope located above the Salmon Beach Community and near Pt. Defiance Park in Tacoma, WA. The parcel has experienced past tree and vegetation management at private citizen request and direction under a 1995 City management plan, "Parkside View Management Plan" (PVMP). This document has been reviewed and will be referenced in our analysis. We were tasked with:

- Assessing the current condition of trees and vegetation on the site by performing a physical site visit
- Evaluating the appropriateness of the PVMP based on the current site conditions
- Reviewing current City and State regulations and determine PVMP compliance, and
- Providing recommendations for PVMP revisions to meet compliance and site goals if needed.

Parcel Background

The subject site is a City of Tacoma owned parcel dedicated to passive open space. At the time of the parcel dedication during the development of the upslope Parkside housing development, the hearings examiner insisted that the parcel be placed under City jurisdiction to ensure the most responsible care and protection of the slope and vegetation. The parcel is a critical area as steep slope and geohazard area and therefore must comply with the City's critical areas code (Tacoma Municipal Code (TMC) 13.11).

Observations and Discussion

The purpose and intent of the 1995 PVMP is to preserve views, view corridors, and allow pruning to enhance private views for Parkside neighborhood residents. In 2017, it is necessary to ensure that the activities in the PMVP and the activities happening on site are continuing to meet regulatory requirements and adapted to accommodate on site changes in vegetation diversity and health to meet passive open space goals and the intent of the property dedication.

Various activities were prescribed by the PVMP in an effort to preserve the view of the houses at the top of the slope while maintaining healthy vegetation along the lower portions of the slope. The PMVP describes the forest canopy in 1995 to be predominantly pacific madrone with a few scattered Douglas-fir and bigleaf maple trees. The tree count was estimated to be 432 trees per acre. The madrone trees are reported to be re-sprouts from disturbance over 30 years ago. In 1995, the Pacific madrone ranged between two to 15 inches in diameter; Douglas-fir ranged from four to 16; bigleaf maple ranged from two to eight inches in diameter.

We observed very little recruitment of new trees. Pacific madrone have not been regenerating and the size range currently is between four and twenty inches. Bigleaf maple trees have also not been regenerating. The majority of these trees range from six to 16 inches in diameter. There are a number of Douglas-fir trees that have sprouted in the last ten years. These conifers range from seedlings to up to 24 inches in diameter.

The PMVP acknowledges that the pacific madrone and some of the Douglas-fir trees were topped in 1987. Overall, the PVMP states that over 95 percent of the site is covered by native shrub and tree species. According to the PVMP in 1987, the madrone trees had 80 percent of the canopy removed which contributed to the death of over 20 percent of the trees. The PMVP specifically calls out that the industry rule of thumb when pruning a tree is that no more than 25 percent of the live crown should be removed in any year's pruning. Crown removal pre-disposes the trees to infection by pathogenic fungi such as *Botryosphaeria dothidea* and *Hendersonomila toruloidea*, which were noted on the site.

During our assessment, we observed that at minimum 80 percent of the pacific madrone are in advanced stages of decline or have succumb to poor cultural management and disease. We noted that the vast majority of madrone and Douglas-fir trees that had greater than the 25 percent of the live crown removed are infected with a disease or are dead. I will discuss this further, later in this section of the report.

The PVMP divides the site into three main zones: Zone A, the uppermost area on the slope, but dips down to encompass the entire slope run near the parking lot ; Zone B, the lower and middle portions of the slope; and Zone C, areas in the northern and southern parts of the site which have been designated as "No Activity". The most aggressive vegetation pruning was performed in Zone A for view management, while Zone B was designated for selective tree removal. No pruning or other actions were to be performed in Zone C.

The following discussion presents the current site conditions per zone as noted on November 15, 2016 and evaluates the current status to the PVMP objectives.

Zone A consists mainly of a high density impenetrable invasive weed mass including species such as Himalayan blackberry (*Rubus bifrons*), Scotch broom (*Cytisus scoparius*), and bindweed (*Calystegia sepium*) vines (see Figures 1-3). Approximately 90 percent of the area is invasive species. These weeds have likely flourished in this area since the majority of tree canopy has been removed and there has been a lack of maintenance and replacement with desirable species.

The blackberry canes and bindweed vines are climbing desirable trees within Zone B and appear to be impacting the growth of new vegetation, tree regeneration, and spread of existing native vegetation. The PVMP specifically calls out to have the blackberry removed from desirable trees. Based on the high density of invasive plants, it does not appear that any maintenance activities have been completed. It is recommended that invasive species removal and control be ongoing and native species be planted and allowed to spread. In my opinion, if not controlled, the invasive weeds will further encroach down the slope where they will likely out compete the native species.

Also, the PMVP recommends planting approximately 100 two year old shore pine (*Pinus contorta* var. *contorta*) trees along the lower section of Zone A as a future screen of the parking lot. We did not see any evidence of shore pines having been planted recently or twenty years ago. It is possible that these saplings were planted as recommended but either died or succumb to invasive weeds. However, we did find young Douglas-fir (*Pseudotsuga menziesii*) trees and seedlings in several sections around the lower edge of Zone A. We could not determine if these were planted, and judging by their clustered distribution, we believe they naturally regenerated.

Zone B primarily consists of Pacific madrone (*Arbutus menziesii*), Douglas-fir, and bigleaf maple (*Acer macrophyllum*) trees in the over story. Declining pacific madrone trees comprise at least 60 percent of the canopy in this zone. The understory consists of a high density of native small trees, shrubs and ground covers. Seventy percent of the trees within this zone have been extensively altered including crown reductions, top cuts, snagging and removals.

Madrone

The 10 year goal of the PVMP was to “create a lower canopy (ten feet – 15 feet tall) of Pacific Madrone sprouts that will maintain soil stability, provide aesthetic amenities, wildlife habitat, and protect the views in the view sensitive area.” This goal has not been achieved and based on the current conditions (disease), past management (improper pruning), there is a very low probability that it can be achieved based on the existing plan.

The management plan from 1995 identifies issues with the madrone and provides a prescription to “restoring the vigor to these trees.” Larger Pacific madrone trees were to be cut at approximately ten feet to invigorate re-sprouting and encourage new growth. From our observations, re-sprouting has not occurred and most of the madrone trees are in advanced decline if not dead already (see Figures 4 and 5). The deterioration of the stand is likely due to disease, aggressive pruning, and changes to the site conditions and in my opinion will not recover. No regeneration of madrone was noted.

We observed a low number of smaller madrone trees that were topped and re-sprouting (see Figure 6). The sprouts on the trees appeared to be in good health, however, the main trunks have indicators of disease. In my opinion, these trees likely have a short useful life expectancy. The plan provides guidelines to approach cutting the madrone trees including follow-up pruning to reduce the number of sprouts and cutting back to laterals at specific heights. We did not observe any indication that follow-up pruning had been performed.

The management plan prescribes in 1996 to reduce all Douglas-firs saplings to at least 2 whorls of branches to create shrubby erosion control trees. The plan also states that selected sprouts from the 1987 work need crown reduction pruning to a height of six to ten feet. Reducing the height of a tree to a predetermined level without taking into the account of the structure or physiology of the tree is considered topping.

Topping is not consistent with American National Standards Institute (ANSI) best management practices. The extent of pruning conducted on site is also not consistent with the PMVP where it specifically calls out that the industry rule of thumb that when pruning a tree, no more than 25 percent of the live crown should be removed in any year's pruning. While some of the trees have been able to sprout with new growth, many of them have died (see Figures 7 through 9).

The pruning guidelines outlined in the plan are stated to conform to the ANSI A300 standard and Best Management Practices, however, it is not clear to me how this specific treatment is in accord with these current standards. We would not recommend this as a management strategy as continued topping of Douglas fir trees is not sustainable and there is no guarantee that the trees will continue to survive or provide the functions of the previous erosion control root mass over time.

The plan states that 80-percent of the Douglas-fir slash should be removed from the site or chipped and all branches and stems should be lopped or scattered throughout the site. These should be cut to sections no longer than three feet in length and should be made to lie flat on the ground, not covering the healthy native plants such as salal (*Gaultheria shallon*). I agree with this approach. This may have happened in the initial pruning phase but has not occurred in recent pruning activities; instead, the dead wood appears to have been left where it fell (see Figure 10) covering native plants.

Another ANSI A300 standard and a guideline in the management plan is that no tree climbing spurs are to be used on trees that are to be pruned but can be used on trees to be removed and trees to be turned into a wildlife snag. We saw evidence of spikes being used on live trees including Douglas-fir and Pacific madrone trees (see Figure 11).

Zone C appeared to have the pruning restrictions followed, however, we did notice that some pruning was performed offsite of the designated parcel. We do not know if permission was granted to perform these reductions, but thought that our findings should be included here (see Figures 12 & 13).

In summation, based on our on-site observations, we believe the PVMP has not been followed as written and needs revisions to more accurately reflect the current site conditions, re-state current ANSI standards and comply with local and state regulations. The PVMP has clearly defined activities to be performed every 4 to 5 years, and states that management will be needed in perpetuity. Judging from what we saw on the site, we do not believe that management has been performed regularly.

Additionally, where management was performed, it did not consistently follow the guidelines as stipulated in the management plan.

Evaluation of the Parkside View Management Plan (PVMP) and Regulations

The subject site is currently designated an environmental critical area due to being a geological hazard area. Based on the review of the Tacoma Municipal Code, specifically TMC 13.11.730 A1(i) and B1(m) applying to both erosion and landslide hazard areas respectively, the code allows for “trimming and limbing of vegetation for the creation and maintenance of view corridors, removal of site distance obstructions as determined by the City Traffic Engineer, removal of hazardous trees, or clearing associated with routine maintenance by utility agencies or companies; provided that the soils are not disturbed and the loss of vegetation cover will not significantly increase risks of landslide or erosion.” (Ord. 27431, 53; passed Nov. 15, 2005)

Vegetation is a critical component in maintaining shallow seated slope stability. This is accomplished in several different ways including reducing surface erosion by intercepting rain, strengthening soil with roots, retaining and creating new soil, and increasing soil percolation. Conifer trees such as Douglas-fir and broad leaf evergreen trees such as madrone provide year round foliage cover and are well suited to reduce surface erosion and protecting slopes. A stratified canopy including the upper, middle, understory, and ground layer provide an interconnected mass of roots for preserving soil. This canopy structure also is vital to intercepting rain and reducing the negative impacts to the slope.

There is evidence of numerous activities that have occurred on the site that do not appear to be consistent with the PVMP or compliant with current code including:

- Non-conformance with ANSI A300 guidelines and Best Management Practices such as,
 - Topping
 - Removing greater than 25 percent of the canopy in a single pruning event
 - Spur climbing trees that were pruned
- Slash was not removed, was suppressing native vegetation, and not in contact with the ground
- No re-evaluation of ongoing treatments or stand conditions.
- No shore pine trees have been planted as proposed to replace canopy removed.
- No maintenance of invasive species or protection of desirable trees.
- Pruning has occurred off-site from the designated area.

The PVMP developed in 1995 appears to have provided an accurate description of the site, forest canopy, and understory structure at that time. However, the changes in forest and vegetation composition, invasive species presence, and decrease in canopy coverage have affected the function of the site. A lower canopy profile has not been realized – trees that were topped have effectively died leaving holes for invasive species to populate. The ten year goal of the management plan to generate a lower canopy profile and retain the functions and amenities the vegetation provides has not been realized. A re-evaluation report should be completed before any additional treatments.

Another gap is the PVMP did not take into account any information regarding the health of any specific tree to be pruned but just prescribes a blanket approach. Trees in poor condition are less able to handle significant pruning than those that are vigorous and healthy. The PVMP noted the poor conditions of the

madrone trees and assumed they would vigorously re-grow. Based on my observations, sprout development was over estimated and many of these trees have died or will never regain vigor. The stand has been significantly altered.

Based on my knowledge, training, and experience, it is my opinion that portions of the PVMP were either poorly implemented or not adhered to. These oversights should have been addressed during a re-evaluation period. In many cases “pruning”, especially on the Douglas-fir, did not comply with ANSI A300 standards or Best Management Practices. The PVMP indicates that trees should be cut back to lateral branches but in most cases the trees were simply topped.

Recommendations for addressing the slash, erosion control measures, and native understory vegetation have not been followed as debris was thrown on the slope. Trees planted for mitigation of lost canopy and screening from the parking lot were not visible. Tree replacement should have been recommended or monitored during a re-evaluation period. Invasive species are moving down the slope and not being managed.

Maintenance pruning on trees selected for retention does not appear to be occurring regularly, which negatively impacts the desired form and structure. If pruned in a manner similar to the past, it is likely that there will be additional tree loss/death due to the stresses associated with the removal of large parts.

The PMVP provided work guidance for a 15 year period of time, which ended in 2010. The plan acknowledges that “with any long-term vegetation management plan, it must be dynamic to adapt to any changes in the plant community that result from management activity, weather, and other influences.” The PVMP does not accurately depict the existing site conditions nor does it address any of the other influences, such as current environmental regulations.

One of the prescriptions in the plan is that every four years after treatment, the site should be re-evaluated prior to future treatments. According to the plan, this should be done in perpetuity. To my knowledge, there are no additional reports from the re-evaluating periods or supplemental recommendations provided following treatments. A re-evaluation of the site and revised management plan is recommended.

Conclusion

In my opinion, the madrone trees that previously comprised 80 percent of the stand have a short safe useful life expectancy and should not be considered viable. Plans should be developed to restore the canopy and functions that have been lost due to the decline of the madrone and other trees. A contingency/mitigation and maintenance plans should be included along with updated evaluations. These plans should be used to correct the conditions that have not been achieved with the 1995 PVMP and alleviate any future issues that may develop with ongoing treatments and ensure site improvements are maintained. These plans should use best available scientific approaches and result in no additional loss of the site’s functions, values, and amenities.

Recommendations

- A qualified environmental professional should perform further analysis of the parcel's loss of functions, values, and amenities and devise a management plan to try and reverse this trend.
- A Restoration plan should be developed to ensure the conditions proposed in the initial PVMP area achieved.
- A contingency/mitigation plan should be developed to address the requirements necessary to adapt to any future negative impacts that may develop following treatment activities.
- A maintenance and monitoring plan should be implemented to ensure any new plantings become established and invasive weeds overall are controlled.
- The site should be re-evaluated and a report developed and provided to the city prior to any new treatment activities.
 - Re-evaluation rates should be increased in frequency if any restoration or mitigation is required.
- A certified arborist or Registered Consulting Arborist should be onsite during any treatment activity to guide pruning and report on the work completed. The arborist should be independent of the tree service completing the work.
- Conditions should be placed on any future work if not implemented as stated in the management plan or if work does not adhere to best management practices and industry standards.



Figure 1 - Himalayan blackberry on upper slope.



Figure 2 - Scotch Broom and Himalayan blackberry over running native vegetation in Zone B.



Figure 3 - Bindweed growing on sapling Douglas-fir.



Figure 4 - Topped madrone has never re-sprouted and is now dead.



Figure 5 – Stand of madrone trees in advanced decline with little chance of recovery.



Figure 6 - Madrone showing regrowth, but no follow up management.



Figure 7 – The yellow arrows point to Douglas-fir trees that were topped and were to be managed in a shrubby form but have since died.



Figure 8 – One of the few topped Douglas-fir trees with regrowth that has not been managed.



Figure 9 - Topped Douglas-fir, one live branch surviving. The pruning does not comply with ANSI A300 standards or the pruning guidelines outlined in the management plan.



Figure 10 – Douglas-fir slash remains where it fell.



Figure 11 - Evidence of spike use on a Pacific madrone tree that was not turned into a snag and is still alive.



Figure 12 - Topped Douglas-fir across the road from the subject parcel.



Figure 13 - More trees topped across roadway.

Appendix A - Assumptions & Limiting Conditions

1. Consultant assumes that any legal description provided to Consultant is correct and that title to property is good and marketable. Consultant assumes no responsibility for legal matters. Consultant assumes all property appraised or evaluated is free and clear, and is under responsible ownership and competent management.
2. Consultant assumes that the property and its use do not violate applicable codes, ordinances, statutes or regulations.
3. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.
 - 3.1 Discussion of land area, canopy area and loss, and tree counts are estimated based on the information provided.
 - 3.2 Tree Solutions has only been provided with the initial 1995 plan and treatment schedule. One of the prescriptions in the plan is that every four years after treatment the site should be re-evaluated prior to treatments. According to the plan, this should be done in perpetuity. I have not received any additional reporting that appeared to be developed during the re-evaluation period or that included supplemental recommendations following treatments.
4. Client may not require Consultant to testify or attend court by reason of any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in the Consulting Arborist Agreement.
5. Unless otherwise required by law, possession of this report does not imply right of publication or use for any purpose by any person other than the person to whom it is addressed, without the prior express written consent of the Consultant.
6. Unless otherwise required by law, no part of this report shall be conveyed by any person, including the Client, the public through advertising, public relations, news, sales or other media without the Consultant's prior express written consent.
7. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.
8. All photographs included in this report were taken by Tree Solutions Inc. during the documented site visit, unless otherwise noted.
9. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.
10. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of the those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied, that the problems or deficiencies of the plans or property in question may not arise in the future.
11. Loss or alteration of any part of this Agreement invalidates the entire report.