



940 NE 147<sup>th</sup> St.  
Shoreline, WA 98155

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March 17, 2016

Shoreline Planning Commission  
17500 Midvale Ave N  
Shoreline, WA 98133

Subject: 145<sup>th</sup> Subarea Addendum to the DEIS

Dear Planning Commission and Mr Szafran:

Please accept our comment on the Addendum to the DEIS for the 145<sup>th</sup> Subarea.

I represent the Shoreline Preservation Society, a local non-profit working to preserve our environmental and historical resources throughout Shoreline, and we request Legal Standing and Party of Record Status on this matter. We ask that all materials, reports and comment made in this matter be incorporated by reference into the record.

We believe there is a likelihood of severe and significant impact to the environment as a result of the inadequacies of this DEIS Addendum, which cannot be mitigated unless it is corrected.

This Addendum to the DEIS is an important matter, and we are glad extra attention is being paid to the two major wetlands within the 145<sup>th</sup> Station Subarea. However, we have serious concerns about this report, especially the lack of adequate detail and inaccuracies presented as facts.

Paramount Park Open Space is an extraordinarily special place, which deserves extraordinary attention and protection. Neighbors here, groups I have been involved with have sought to highlight the assets here and to preserve and restore the environmental values it offers. Since 1989, we have expanded the park, fought to protect adjacent resources, and worked on many grant projects. In 1998, a group I was connected with carried out a major wetland enhancement project there, which removed fill dirt and recreated two ponds, which serve as water quality and wildlife habitat features. This and a subsequent project a few years later, were funded by grants from King County and the

City of Shoreline. We worked with hundreds of volunteers, planted hundreds of native plants, created trails we installed educational signage and brought many groups to visit.

Wildlife habitat and native plants here are extraordinary and must be protected and enhanced.

At that time, the Army Corps had given the area an overall 6.9 acre designation as a wetland. Because the lands have been altered so many times, it is nearly impossible to ascertain what part of the original wetland remains. The fact is that there is clearly a very high water table and wetlands that emerge throughout the park. There are many channels of creek, and steep slopes surrounding the park. Some are in the Park and some are in the surrounding edges and buffers. Not all of the areas that are sensitive are adequately protected either by City ownership or by codes.

Now the Addendum to the DEIS, has put forward maps and reports that do not really clarify anything. Instead the report has minimized the size of the wetland. Those of us who have explored the park thoroughly know there are many, many places that are wetland or buffer or steep slopes, which are not clarified on these maps and in the report.

The aim of this report seems to have been to find every possible way to allow increased density next to the park and reducing the buffers rather than fulfilling the duty of the City, which should be to protect and defend these important wetlands. The report actually has major errors, such as creek channels in the wrong place, or missing entirely. Important wetland sections are also entirely missed. It makes little if any mention of the steep slopes surrounding it or the extraordinary nature of this wetland. Rather it makes it out to be a degraded place of little value and the creeks and wetlands are downgraded.

When asked for background data that was used to create the report, we were told there was none and that this was merely a "reconnaissance report" and therefore didn't need any scientific data to back it up! That has to be very the flimsiest possible basis Addendum to an EIS, done in the name of the taxpayers of Shoreline.

We have hired noted Wetland Biologist, Sarah Cook of Cooke Scientific to review the report. She has found many deficiencies in it. We ask the Commission to study her report and read it carefully and consider the implications of using an inaccurate and incomplete study as a basis for the Addendum to the DEIS. All of the work that goes forward from this report and decisions that will be made about the future of this entire area, the impacts to the ecosystem and watershed you are charged with protecting, depend upon accurate information based upon professional standards.

We suggest that the Commission direct staff to go back and do a more thorough study that truly takes into account the impacts to the neighborhood, the watershed and the community's future. Paramount Park Open Space is too important as future Park space but also as a vital wetland and repository for drainage. These wetlands do crucial work retaining floodwaters, and ground water to feed the stream in dry times. It will take the brunt of any major density increase unless extreme care is taken to protect it for future

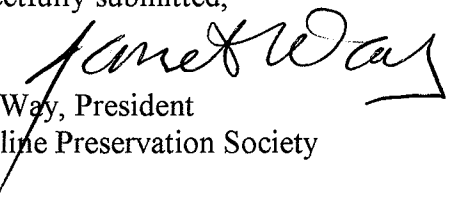
generations. There is just too much at stake for this ecosystem and community to give it short shrift.

We believe that options for protecting, mitigating and improving the park and wetland should be included such as LID techniques, replacing illegal culverts, uncovering other filled wetland areas, improved trails and native plant replacement projects should be a part of this report, not just suggestions on how to build next to wetlands or in liquifaction zones.

We ask that you do everything in your power to protect this open space and these critical areas.

Thank you for your attention to this important matter.

Respectfully submitted,

  
Janet Way, President  
Shoreline Preservation Society

City of Shoreline

Thornton Creek and West Lake  
Washington Basins  
Characterization Report

May 2004



**TETRA TECH/KCM**

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March 10, 2016

Shoreline Preservation Society

**RE: City of Shoreline Paramount Open Space Wetland and Stream Assessment and Comments on the 145<sup>th</sup> Light rail Area DEIS and Subarea proposal.**

I have been asked to review the Wetland and Stream mapping and characterization performed by the City of Shoreline at Paramount Open Space.

As part of my review, I have examined the materials listed below as well as performed a site visit to examine various locations. The results of both are given below.

**Documents Reviewed**

- City of Shoreline. February 2016. 145<sup>th</sup> Street Subarea Planned Action, Addendum to the Draft Environmental Impact Statement.
- City of Shoreline. February 18, 2016. Additional Technical Assessments for the 145<sup>th</sup> Street Station Subarea Plan 6a. Wetlands Update LRSAP Staff Report. Including Memorandums from Otak on Wetlands and GeoEngineers on Geotechnical Assessment.
- Otak. Jan 2015. 145<sup>th</sup> Street Station Subarea Planned Action. Draft Environmental Impact Statement. Prepared for the City of Shoreline.
- R.W. Beck, Inc. July 2005. *City of Shoreline Surface Water Master Plan*. Prepared for the City of Shoreline, Wa.
- Seattle Public Utilities. 2000. Thornton Creek Watershed Characterization Report.
- Tetra Tech/KCM, Inc. May 2004. *Thornton Creek Basin Characterization Report*. Prepared for the City of Shoreline, Wa.
- Tetra Tech/KCM, Inc. May 2004. City of Shoreline Stream and Wetland Inventory and Assessment Appendices.

**COMMENTS AND REVIEW OF THE REPORTS AND SITE VISIT**

My comments below will be focused on the accuracy and deficiencies of the various reports listed above as they related to Paramount Open Space and the existing wetlands, streams, and overall critical areas found in the Park, including the downstream receiving waters of Thornton Creek. I also anticipate commenting on the Twin Ponds critical areas survey and how the

rezone will affect this critical area, but the City's wetlands assessment is not yet ready so my comments on this will be reserved for a later date.

My main emphasis was to determine both in these reports and in the field:

1. **The accuracy of the Wetland Mapping and Rating by Otak in 2015.**
2. **The accuracy of the Stream Mapping within and adjacent to Paramount Open Space by Otak in 2015**
3. **The need to protect the streams and wetlands in Paramount Open Space based on recommendations from the City's Surface Water Master Plan (R.W. Beck 2005) and the 145<sup>th</sup> Street Station Subarea Planned Action (Otak 2105).**
4. **Soils and Geologic Mapping accuracy within and adjacent to Paramount Open Space and the implications of the soils and geology deposits on their potential to affect the wetlands and streams of Paramount Open Space and Thornton Creek as a result of the proposed high density residential development.**

It should be noted that the Growth Management Act (GMA) requires that counties and cities utilize Best Available Science (BAS) in developing policies and regulations to protect the functions and values of critical areas. All ensuing studies and policies must take BAS into consideration before any activities are undertaken in critical areas that might affect their integrity, functions, and values. It is in light of this that I performed the review given below.

1. **The accuracy of the wetland mapping and rating by Otak in 2015 (and how it compares to previous wetland inventories documented in the City's own database).**

In their wetland inventory included in the *Thornton Creek Basin Report* (May 2004), Tetra Tech identified the drainage and sub-drainage basins in the Thornton Creek Watershed, including Paramount Open Space (Figures 1 and 3). This includes wetlands and streams as mapped in Figure 5.

In the 2000 and 2004 Thornton Creek reports by the City of Seattle and Tetra Tech for the City of Shoreline including a wetlands inventory (Appendix B, May 2004), and the City's own GIS database (Shoreline online GIS Mapper) all quote the wetland acreage to be approximately 6.9 acres of forested, shrub, and emergent wetlands in two large wetlands (Appendix B, 2004 Thornton Creek Characterization Report, Table 1). The reconnaissance performed by Otak (City staff report and Otak Memorandum (January 2016) found seven smaller discrete wetlands for a total of only 1.97 acres (Figure 6— yellow and red polygons, Figure 7 detailed map of the reconnaissance). They show no wetlands in the southern part of the Park in the restored area, while we found many stream-associated wetlands in this

part of the park, (Figure 6 arrows showing where additional wetland was found; Figure 8 photo map and Photos 21-25). We also found more wetland in the northeast corner of the Park and associated residences that are not shown on the Otak map (Figure 6 arrows showing where additional wetland was found; Figure 8 photo map and Photos 1-10). And more wetland in the central part of the park between Wetland F and Wetland C such that these two wetlands are actually one wetland system (Photos P1, P2, P18, and P19). Additionally, many of the residences on the east side of the Park along 12<sup>th</sup> Avenue NE had wetland continuing into their western back yards abutting the Park (Figure 6 arrows showing where additional wetland was found; Figure 8 photo map and Photos 12-20). Much of this area was also not included as wetlands mapped by Otak. Approximate GPS locations of wetlands found during our February reconnaissance are shown on Figure 8 where the photo pins are located and on Figure 6 where the arrow points indicate locations where both photos and GPS points were taken in areas that were wetlands.. The arrows shown on Map 6 do not show a formal delineation map. It is indicating areas that met wetland criteria and which were not identified on the Otak map as being wetland. A word about the photos included: The photos show characteristics about the ground conditions – either the vegetation prevalent (which is usually wetland species for the wetland shots) or the soils conditions (again showing wetland soils), or standing water indicating the area has wetland hydrology. When the shots are of upland they indicate this.

The Otak reconnaissance wetland map is also displayed as a layer on the City's Wetland map as a layer that is shown as either a blue or yellow polygon/series of polygons on Figure 6. as the with Wetland III having a much reduced footprint of wetland WL-I and the red pattern with a much reduced footprint over the previous delineation also shown as the blue shaded pattern on Figure 6.

The wetland ratings listed in the Otak reconnaissance from August and September 2015 were all listed as Category III and IV wetlands (see table at top of Figure 7), while the City's wetland inventory reports 4 Category (type) II wetlands and 5 category (type) III wetlands within the Park and three Category (type) II wetlands and 1 Category (type) III wetland just adjacent to the Park. While I did not rate the wetlands during my site evaluation it should be noted that I sat on the team that developed the 1992 wetland rating and I was a technical reviewer and taught the method for the Department of Ecology for the subsequent version (2004 updated in 2008) used for this analysis and I find it unlikely that some of the forested wetlands I saw out in the Park would be less than a Category II wetland rating. The rating should be revisited when a formal delineation is performed because the buffer widths proposed could possibly change as a result of the ratings changing from a Category III to a Category II wetland. This would obviously affect the development footprint on the lots just adjacent to, or including the wetlands that would be a Category II type. The buffer widths assigned to the

Wetlands identified varied from 105 to 165 feet for the forested systems. According to that designated by Otak. Since Category II wetlands under Shoreline Municipal Code (20.80.330 9City of Shoreline , 2016) are assigned the same buffer widths as those assigned for Category III wetlands the width would not have changed unless the scoring for habitat on the data sheets changes. However, changes to the wetland boundary could significantly change the amount of developable land that would be available on the Its along 12<sup>th</sup> Avenue NE.

The two ponds and associated Wetland WL-F on Figure 5 were enhanced and/or constructed by local volunteers under a Water Quality Block Grant awarded by King county Department of Natural Resources prior to the 2004 basin characterization report. These areas are now well established and the plantings installed back in the early 2000's are now well established. Photos on photo sheet 6 of the attached photos show some examples of this area.

## **2. The accuracy of the Stream Mapping within and adjacent to Paramount Open Space by Otak in 2015**

In the 2000 and 2004 Thornton Creek reports by the City of Seattle and Tetra Tech for the City of Shoreline including stream inventory (Appendix A May 2004), and the City's own GIS database (Shoreline online GIS Mapper) all show the streams to be mapped as shown on Figures 5 and on Figure 6, (the overall outline including both the blue and black segments). Figure 6 also shows the seam/creek reconnaissance identified by Otak in their December 2015 reconnaissance as the blue segments with the detailed stream reconnaissance shown on Figure 7.

The drainages (streams and creeks) mapped in the Park by Otak (Figures 6 and 7) include some omissions that have been added back as the black lines on the City's GIS database (Figure 6). We observed these creeks/drainages are still present when we performed our reconnaissance on January 29<sup>th</sup>, 2016 (Photos P8, P9, P11, P17, P20, P23, P24, P21, and P25). Little's Creek is the main tributary to Thornton Creek through the park but there are many other tributaries, wetlands, ponds and connecting channels that are also present (See Figures 5 and 6). Some of the channels are now piped, especially the main channel that passes through a culvert under the gravel road the bisects the Park from north to south (photo P17).

Little's Creek (Subbasin TC-C – Figure 3) flows through Paramount Open Space through segment TC14 mapped on Figure 5 as a tributary to Thornton Creek. The aerial photograph evidence documented in the City's Thornton Creek Characterization Report states that it flowed to Jackson Park in an open stream prior to the 1940's (Tetra Tech 2004). Much of this Creek has been piped from residences west of NE 174<sup>th</sup> Street and 14<sup>th</sup> Ave NE with another tributary that is now also flowing from a culvert. Beginning at 12<sup>th</sup> Ave NE, the creek (Figures 5 and 6) come out of a pipe and flow west to the Park and then jog south where the tributary splits into two. The western arm, which is the main channel of Little's



Creek, flows through Wetland WL-1 (2004 inventory, Figure 5) and a drainage tract with landscaping; and the eastern arm flows through on the edge of Wetland WL-L and through Wetland WL-F (also Figure 5 where it enters the pond and wetland enhancement area identified above supplying the wetlands, seeps back into the second pond via small channels described above and then flows west into the main channel of Littles Creek. The stream through the Park is generally still in good condition with sufficient bank vegetation and sparse armoring and fair pool frequency. Gravel and quarry spall is present in the south end of the reach but overall this segment is the ONLY one of the three segments of Thornton Creek within the City of Shoreline that was given a "fair" rating when assessed (Tetra Tech 2005). It is imperative that the City do all it can to maintain the integrity of these tributaries should the new zoning become reality. Increasing residence density on the east side of the Park would be in the direct path of many of these channels and no additional piping should be allowed. It should be noted that the DEIS states that Littles Creek lies ½ mile from the Proposed Light Rail Station, but actually it is only ¼ of a mile.

**3. The need to protect the streams and wetlands in Paramount Open Space based on recommendations from the City's Surface Water Master Plan (R.W. Beck 2005) and the 145<sup>th</sup> Street Station Subarea Planned Action (Otak 2105).**

In 2004 the drainage study evaluated the total impervious areas in subdrainage TC-C to be 45 percent (Tetra-Tech, Thornton Creek Characterization Report, Figure 3). The future build-out of the subdrainage projected an increase to 50 percent impervious if the zoning stayed the same at R-6. Changes from a R-6 zoning to the proposed MUR-30 and MUR40 and MUR 70 proposed adjacent to the Park will increase the amount of impervious surface up to 90 percent with the equivalent of 48 units/acre and 75 percent with 18 units per acre (Tetra Tech 2005 Table 2-3). This increased impervious surface would be associated with increase surface flow in streams post-storm event. The Tetra Tech report also states that it could "result in flooding and destroy aquatic and riparian habitat by eroding banks, and removing the riparian (stream-adjacent) vegetation".

The DEIS states the stormwater runoff (analysis) is only very preliminary: "The analysis of change in peak discharge was for DEIS planning purposes only and does not reflect actual expected post-redevelopment conditions". How does the City expect to vote on this rezone with no real idea of what may occur as a result of the proposed changes?

**4. Soils and Geologic Mapping accuracy within and adjacent to Paramount Open Space and the implications of the soils and geology deposits on their potential to affect the wetlands and streams of Paramount Open Space and Thornton Creek as a result of the proposed high density residential development.**

Paramount Open Space and the area directly to the south have been mapped as being underlain by Esperence Sands and Younger Alluvium (Tetra Tech 2004). It is the only area in the entire Shoreline part of the basin with Younger Alluvium. It seems likely that the young alluvium mapped is recent sediment deposited as the basin became developed. This means that this area is unstable and prone to erosion when the soils are disturbed. There is certainly the expectation that new development would add additional sediment to this area, which could pose a problem to the streams and creeks in the area and also for the water quality of Thornton Creek in the downstream receiving waters.

There is no way to verify this independently through NRCS soils maps since there is no soils mapping available through the regular sources for the City. Extensive research online (NRSC soils mapper), in the City's database (GIS Mapper), and in the King County hard copy soils mapping (Snyder, Gale, and Pringle. 1973, Soil Survey of the King County Area) have yielded no soils data for the City, including the Park and adjacent properties. This is all the more reason why the City should have done some preliminary soils evaluations for this area.

The City's analysis of the soils and the peat deposits in and nearby to the Park identified "that high groundwater or peat conditions exist in some of the areas near Paramount Open Space and Twin Ponds Park". Unfortunately the City's consultant only viewed the study from the perspective of how difficult it will be to build over the peat soils (Otak, January 2016).

"Redevelopment of properties with peat-laden soils, high groundwater, and soils subject to liquefaction and the required engineering treatments and mitigations to address these conditions typically would be more expensive than redevelopment of properties without these conditions."

The study done by Otak did not include an analysis of what the impact would be to groundwater and groundwater recharge if the peat soils were removed or compacted. This is a huge error on the City's part because construction that disrupted these soil deposits could cause dewatering of the wetlands and/or streams in the Park. There is NO discussion of this aspect of the problem anywhere in the DEIS or Staff reports. The geotechnical report only includes borings outside of the areas that would be of interest from a wetland and stream dewatering perspective.

### **Discussion.**

If the City is waiting for redevelopment projects to perform site-specific geotechnical and wetlands studies, how do they propose they can make decisions on whether or not the rezone is even feasible or desirable now?

The City has failed to accurately map the wetlands within – and adjacent to, the Park so that potential impacts to critical areas (wetlands, streams, liquefaction zones) as a result of converting the single family residences to high density multi-family units, is great. I can guarantee, based on my site

visit, that there are more wetlands along the eastern and southwestern sides of the Park that were NOT included in the Otak reconnaissance. At the very least the older on-record 6.9 - acre delineation should be used by the City when evaluating the rezone. It would be more accurate for a new delineation to be done, (and not in August at the driest time of year) at least along the eastern edge of the Park. At the very least, this should include the lots along the western edge of 12<sup>th</sup> Ave NE, including Lots (Figure 6): 15104 south to 1113 and lots 1117, 1123, 112014849, 1123, 14829, 14823, 14815, 14811, 14729, 14721, 14719, 14721, 14534, and 14528, (Figure 6). It would also be important to assess the channel that is aligned with the back of Lots 14652, 14646, 14640, 14634, 14612, 14604, 1460?, 93?, and 927.

Failure to map the Soils and Geology in the Paramount Open Space area and also to include an analysis on these features in the potential impacts that could occur as a result of the rezone, is a huge problem with the City's ability to develop an informed decision about the potential impacts that may occur as a result of the rezone. The City cannot wait till a "future time" to do these studies. As discussed above, there are known peat deposits and high groundwater conditions in and around Paramount Open Space though the extent and exact location are not known. It is a well accepted fact that soil compaction in peat soils and paving (impervious surface) reduces infiltration and storage capacity of soils, which in turn lessens groundwater recharge and base flow in streams. It would be very detrimental to the wetlands within and adjacent to the Park as well as the water quality and the hydrologic regime of Thornton Creek through the Park and downstream. This is coupled by the fact that nowhere in any of the preliminary analyses did the City or their consultant look at the problem of peat soils and high groundwater with respect to dewatering the wetlands and streams. They only looked at the cost of constructing developments under these conditions. This is a huge error, and one that will result in unavoidable adverse impacts to critical areas within and adjacent to the Park.

There are numerous small tributaries throughout Paramount Open Space that are fed by this groundwater base flow. Any reduction in the buffer width allowed adjacent to the streams, or piping of the streams/drainages as a result of allowing higher density development; will in-turn reduce the base flow feeding these tributaries and subsequently Thornton Creek. Additionally, increased surface flow in streams as a result of increased impervious surface and less infiltration post-storm event can cause flooding and destroy aquatic and riparian habitat by eroding banks, incising the stream within the banks, and removing the riparian (stream-adjacent) vegetation. It can also cause a situation where rainfall exceeds infiltration and more water is carried in the streams and creeks than they can accommodate increasing the bank erosion/failure and creek channel incision. Development that occurs in conjunction with increased impervious surface and decreased buffer widths are KNOWN to cause increases in peak flows and runoff volumes downstream. It is clear that the City has NOT

evaluated the repercussions of the changes that will occur if the neighborhood surrounding Paramount Open Space goes from single family residences to more multi-family residences with reduced buffers adjacent to the creeks and the wetlands. It is precisely at the time when you increase the number of units and people that you need to INCREASE the buffer widths to afford sufficient protection of the wetlands and Creeks and downstream receiving water quality for salmonids and other resident fish. Yet, the City is proposing to decrease the buffer widths? This makes no ecological sense and greatly increases the chances of catastrophic stream degradation; resulting in removal of riparian vegetation, channel incision causing dewatering of stream-adjacent wetlands, and flooding of adjacent properties that are already saturated and flood-prone during the winter. The City's Failure to correctly delineate the wetlands, creeks, and soils and model the effects of the increased impervious area will only exacerbate these issues.

Add to these projections the apparent change in climate and possible increase in rainfall (from Cliff Mass's blog from 3/1/16):

"At 1 PM today [March 1st], Seattle weather history was made. Seattle has received enough precipitation since October 1 to make it the wettest winter in Seattle history. The water year starts on October 1 and this makes a lot of sense here in the Northwest, since our summers are very dry and the real rain usually does not begin until mid to late October. October 1-March 1 encompasses our meteorological winter and is not an arbitrary period. "

And the problem of increased stream volume, flooding, bank erosion and failure and washing away of the riparian vegetation increases in severity. It is imperative that any projections of the effects of increased impervious surface in the sub-basin used for evaluating the potential impacts of changing the zoning, have to include climate change in the model.

There is little mention of Low Impact Design (LID) proposals included in the DEIS analysis which could help mitigate some of the increased density and impervious surface experienced in a higher density land use as proposed. These alternatives would be more expensive and unless required by the City would likely not be used by potential developers.

The Paramount Open Space Open Space and the adjacent neighborhood to the east is the largest remaining wetland area in Shoreline and the Thornton Creek Watershed (Tetra Tech 2004 and City of Seattle 2000). The overall wetland area has been mapped previously at approximately 6.9 acres. Little's Creek and the many tributaries in the Park constitute a relatively healthy riparian corridor. The Park has undergone many assaults over the years and there are certainly many areas that are invaded by weedy species, but with the restoration activity that has occurred in the southern half of the park, the Park is still a beautiful and healthy natural area. Historic habitat loss in the buffer areas surrounding the wetlands and streams in the Park is also problematic. There is upland area in the

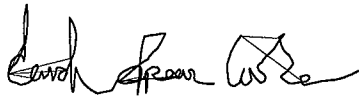
northwest corner of the park but upland habitat is at a premium in the Park. The buffer of the wetlands east of the Park is currently a large percentage of the available upland habitat in the area. Reducing the buffer widths in this area and allowing for high density construction along his edge of the large wetland system would be very detrimental to the backyard habitats and tree canopy that are now providing relatively high quality habitat for local bird and insect life.

And finally, "Since the Thornton Creek Basin within the City of Shoreline is the headwaters of the entire Thornton Creek Basin, the high percentage of impervious surface will affect the entire downstream watershed (Tetra Tech 2004)".

One of the options mentioned in the Agenda 6a LRSAP staff report is to "amend one of the potential zoning scenarios to exclude land near Paramount Open Space Open Space or Twin Ponds park from rezoning." This appears to be a much smarter alternative than opening the City to a series of expenses for studies and mitigation for preserving the integrity of the creeks and wetlands from the highly probably impacts of high density development and reduced buffers.

Please feel free to contact me if you have any questions regarding this review.

Sarah Spear Cooke

A handwritten signature in black ink, appearing to read "Sarah Spear Cooke". The signature is fluid and cursive, with the first name "Sarah" being the most prominent.

Professional Wetland Scientist and Fellow,  
Society of Wetland Scientists

mitigation for buffer impacts. Wetland Resources (2000) addressed this wetland in more detail and documented its size as exceeding one acre.

***Wetland F, Paramount Park***

This previously mapped wetland (WL-F) is in Paramount Park between 10th Avenue NE and 12th Avenue NE, just north of NE 145th Street. It is one of the larger wetlands in the City, at approximately 6.9 acres. This wetland is associated with Reach TC14, known as Little Creek, where a series of wetlands, ponds and connecting channels are present. Local volunteers have completed several wetland enhancement projects, including removing fill and planting native vegetation in the vicinity of the ponds and planting trees in a detention facility constructed by King County. Three wetland classes are present: forested, scrub-shrub and emergent. The description for Reach TC14 provides additional information on this wetland.

***Wetland G, Thornton Creek 13***

This previously mapped wetland (WL-G) is adjacent to TC13 near North 179th Street and 21st Avenue North. During surveys for the stream inventory, this reach was not found to have water or natural substrate. However, on October 26, 2001, the area in the northeast corner of the N 178th Street and N Meridian Avenue intersection was found to have small pockets of standing water. The area is forested with sparse herbaceous or shrub cover. Dominant trees included red alder, willow, and cedar. Spiraea, salmonberry, lady fern, horsetail and creeping buttercup were also present. The total area is approximately 0.4 acres. This wetland is a palustrine forested wetland. It is confined on all sides by roads or homes and is very small.

Jones and Stokes (1990) described and delineated this wetland in 1990. They described stormwater as entering the site through a 12-inch corrugated metal culvert at the southeast corner of the site and exiting the wetland through another culvert at the corner of North 178th Street and Meridian Avenue.

***Wetland H, Ronald Bog***

Ronald Bog (WL-H) is a open water/wetland complex occupying approximately 7.7 acres. The wetland portion around the edge occupies approximately 1 acre. Otak (December 2001) conducted a detailed wetland study of Ronald Bog and addressed the individual wetland types. The following descriptions are from the Otak report:

“Wetland 1 is a palustrine forested wetland of approximately 0.8 acres in size, located along the inflow corridor that enters Ronald Bog from the northeast. The open water course flows due south, carrying stormwater discharge from 175th Street. The riparian corridor is dominated by red alder (*Alnus rubra*) trees, with a mixed shrub component of non-native Himalayan blackberry (*Rubus procerus*) and salmonberry (*Rubus spectabilis*). Where the ditch widens, the stream drops its bed load and a non-vegetated mud flat is present. The forest in this area is red alder and black cottonwood (*Populus balsamifera*) with some willow (*Salix spp.*) in the understory. Groundcover is sparsely vegetated with giant horsetail (*Equisetum telmateia*), creeping

*Thornton Creek Reach 14*

Thornton Creek Reach 14 (TC14) runs as Littles Creek through Paramount Park, where a series of wetlands, ponds and connecting channels occur. Most of the data collected at this palustrine open water course indicated ratings of good or fair. Riparian species were immature native conifers or hardwoods, bank condition was good due to sufficient bank vegetation and sparse armoring, and pool frequency was fair. Gravel and quarry spalls were present in the lower end of the reach. Benthic invertebrate diversity was rated poor. Overall, this reach is one of only three reaches in the City given a fair rating. \*

Paramount Park contains a diverse vegetation community, including watercress in portions of the stream and red elderberry, red osier dogwood, Indian plum, skunk cabbage, hardstem bulrush, slough sedge and a variety of ferns in the wetland and riparian corridor.

Beginning at 12th Avenue NE, the stream flows west out of a pipe, turns south as it enters the eastern edge of Paramount Park Open Space, splits, and flows south in two channels. The east channel, including flow from Wetland WL-I through a short segment of open water course, crosses beneath a pedestrian trail in a culvert that allows fish passage. It then enters a pond, seeps into a wetland, enters a second pond, and reconnects with the west or main channel (Littles Creek).

The two ponds were constructed by local volunteers to enhance the wetlands under a Water Quality Block Grant awarded by King County Department of Natural Resources. In addition, the volunteers cleared invasive plant species, planted native vegetation, placed large wood in the ponds and along the stream courses, and established an interpretive trail emphasizing the importance of water quality and wetlands. These volunteers diverted the flow from an old King County detention facility into a constructed channel to feed the wetland ponds. Small channels connect each pond with both channels.

The west channel, which is Littles Creek proper, flows west through a City-owned drainage tract with landscaping and property improvements on each side. This section is prone to flooding. The west channel then turns south and enters Paramount Park. It enters a wetland and then crosses beneath the pedestrian trail via a culvert. It continues south until it reconnects with the east channel.









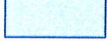


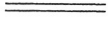



*Thornton Creek Reach 15*

Thornton Creek Reach 15 (TC15) extends from North 150th Street to a detention pond at North 170th Street and 15th Avenue NE. A piped segment drains the Paramount Park playfield. It is alternately piped and channelized. Because the piped portion is longer than the open water course portion, this reach was mapped as a piped water course.

*Thornton Creek Reach 16*

Thornton Creek Reach 16 (TC16) is east of 15th Avenue NE. Two primarily piped branches extend from Hamlin Park, join north of NE 150th Street and continue past the Shoreline City limit at NE 145th Street to join the main Thornton Creek system. There is a small portion of open water course along this reach. Because of the preponderance of piping, this reach was mapped as a piped water course.

**Legend**

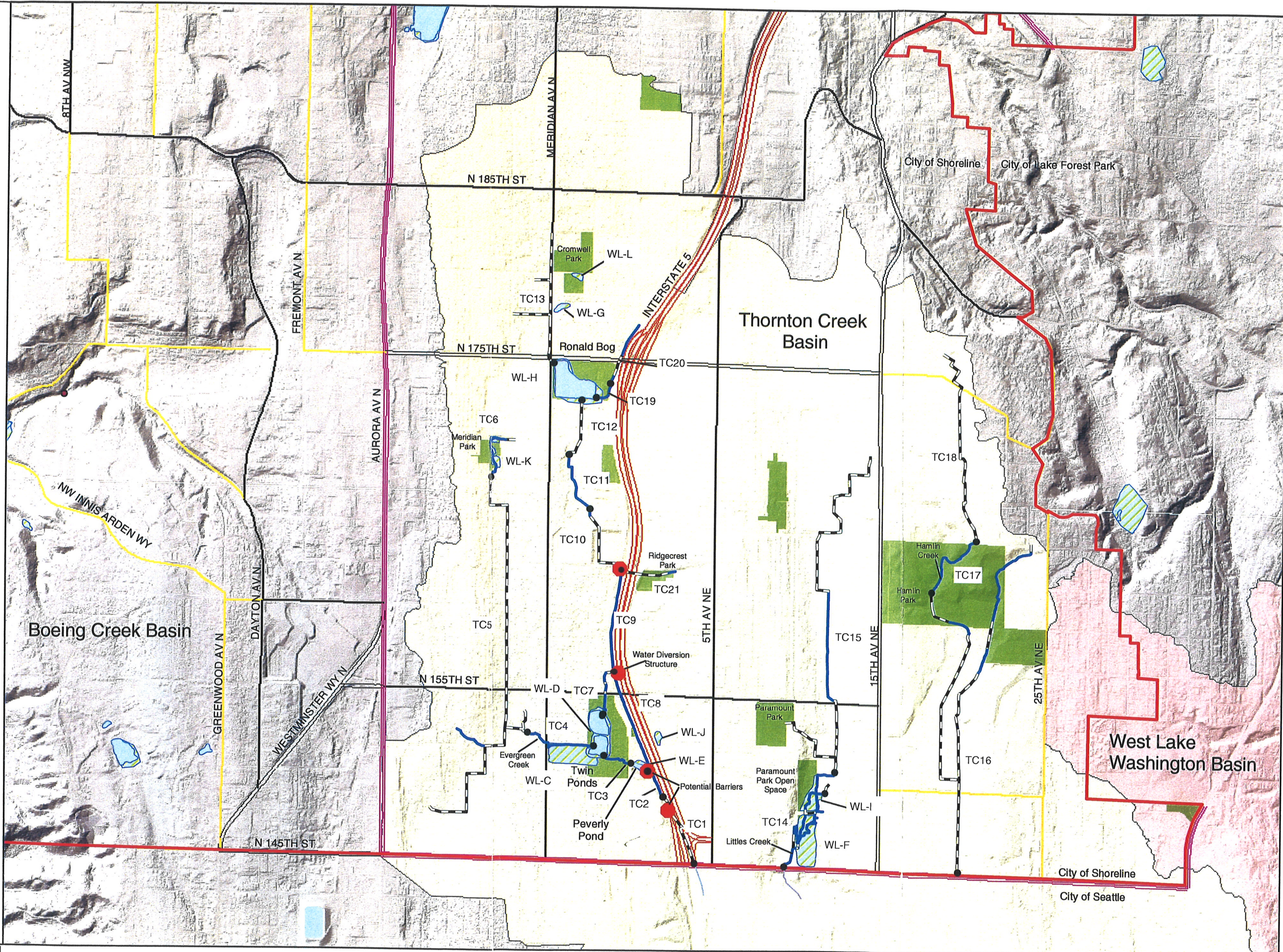
-  Open Water Course
-  Piped Water Course
-  Wetlands
- WL-C Wetland ID
-  Parks
- TC1 Reach ID
-  Reach Starting Point
-  Fish Passage Barrier
-  Thornton Creek Basin
-  W. Lake Washington Basin
-  Waterbodies
-  Shoreline City Limits
-  Interstate
-  State Route
-  Principal Arterial
-  Minor Arterial
-  Collector Arterial



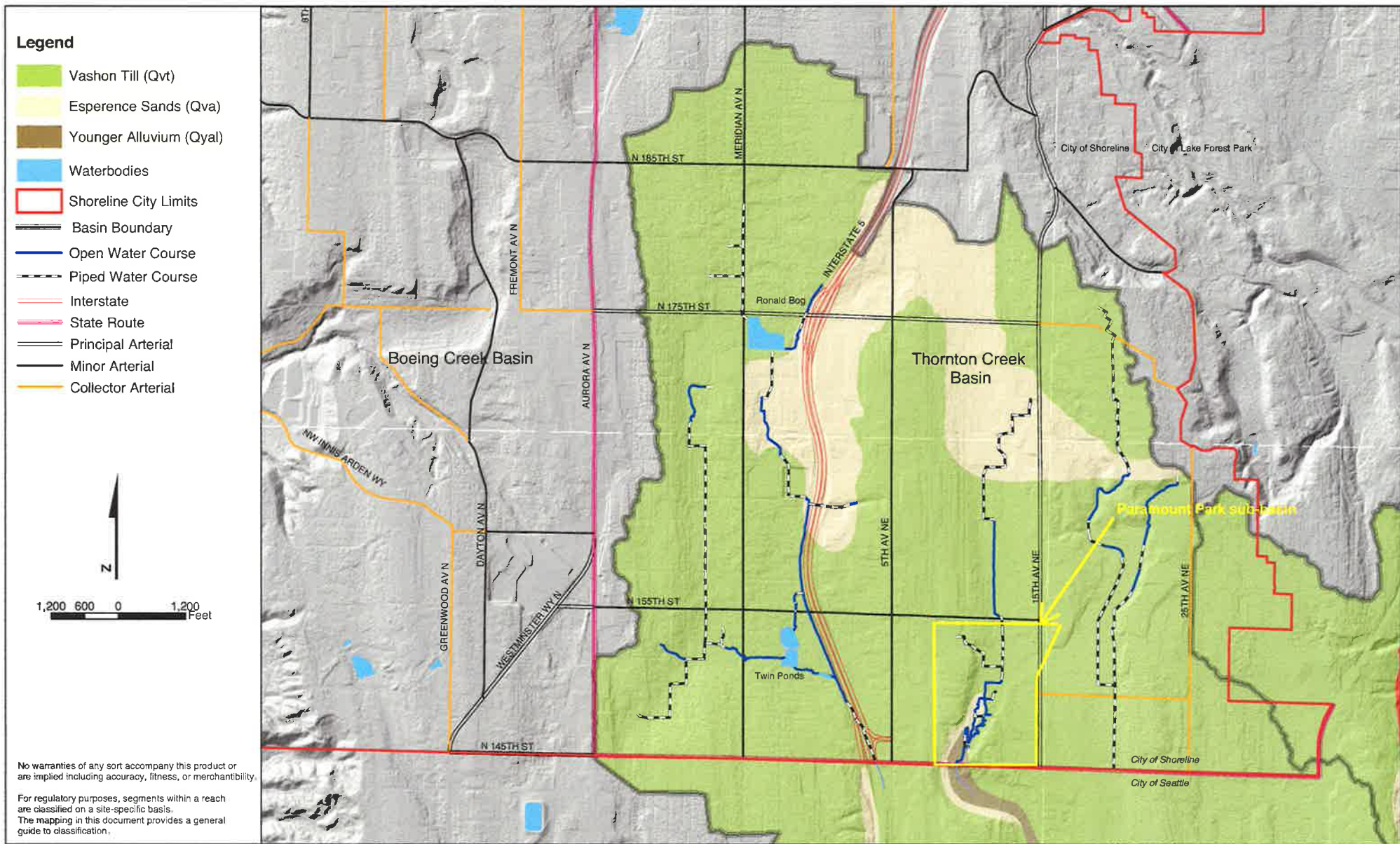
1,200 600 0 1,200 Feet

No warranties of any sort accompany this product or are implied including accuracy, fitness, or merchantability.

For regulatory purposes, segments within a reach are classified on a site-specific basis. The mapping in this document provides a general guide to classification.







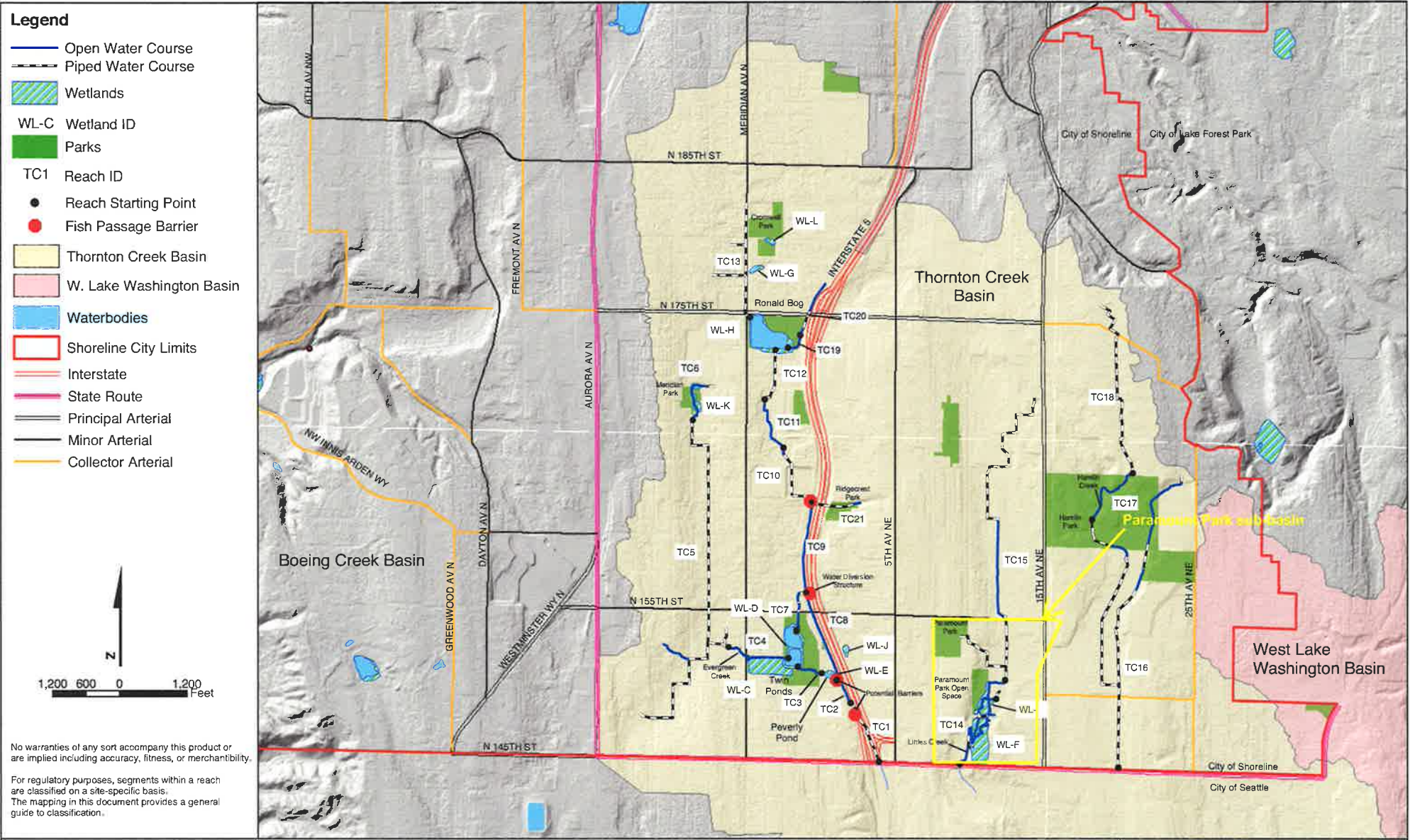


Figure 2-3  
Stream Reaches, Wetlands  
and Fish Passage Barriers



Thornton Creek Basin Characterization Report

Figure 2: Thornton Creek Wetlands  
and Streams

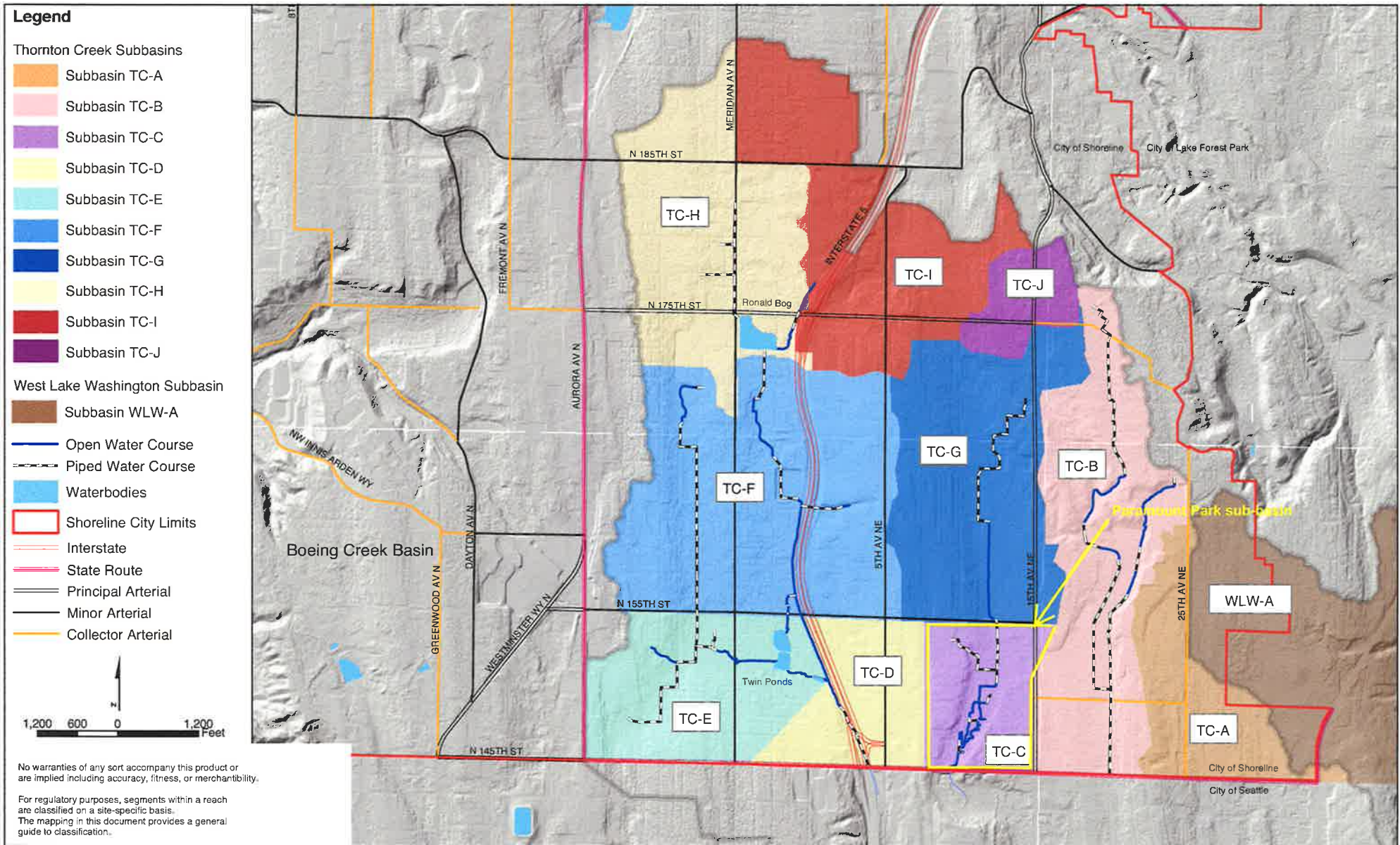
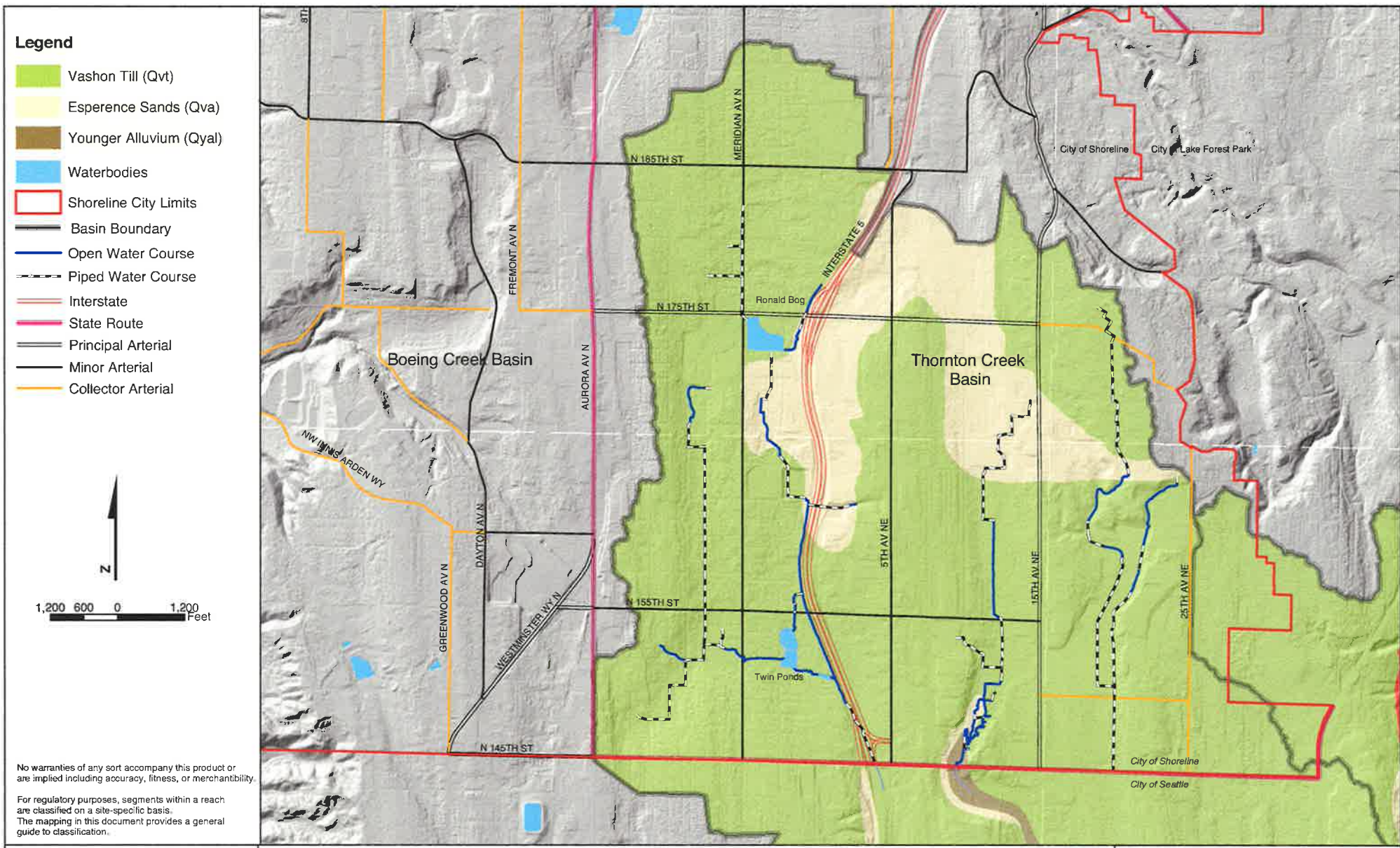


Figure 2-2  
Subbasins



Thornton Creek Basin Characterization Report

Figure 3: Thornton Creek Sub-Basins-



Tetra Tech / KCM  
1917 1st Avenue  
Seattle WA 98101

Figure 2-6  
Surficial Geology



Thornton Creek Basin Characterization Report

Figure 4: Thornton Creek Sub-Basins- Surficial Geology

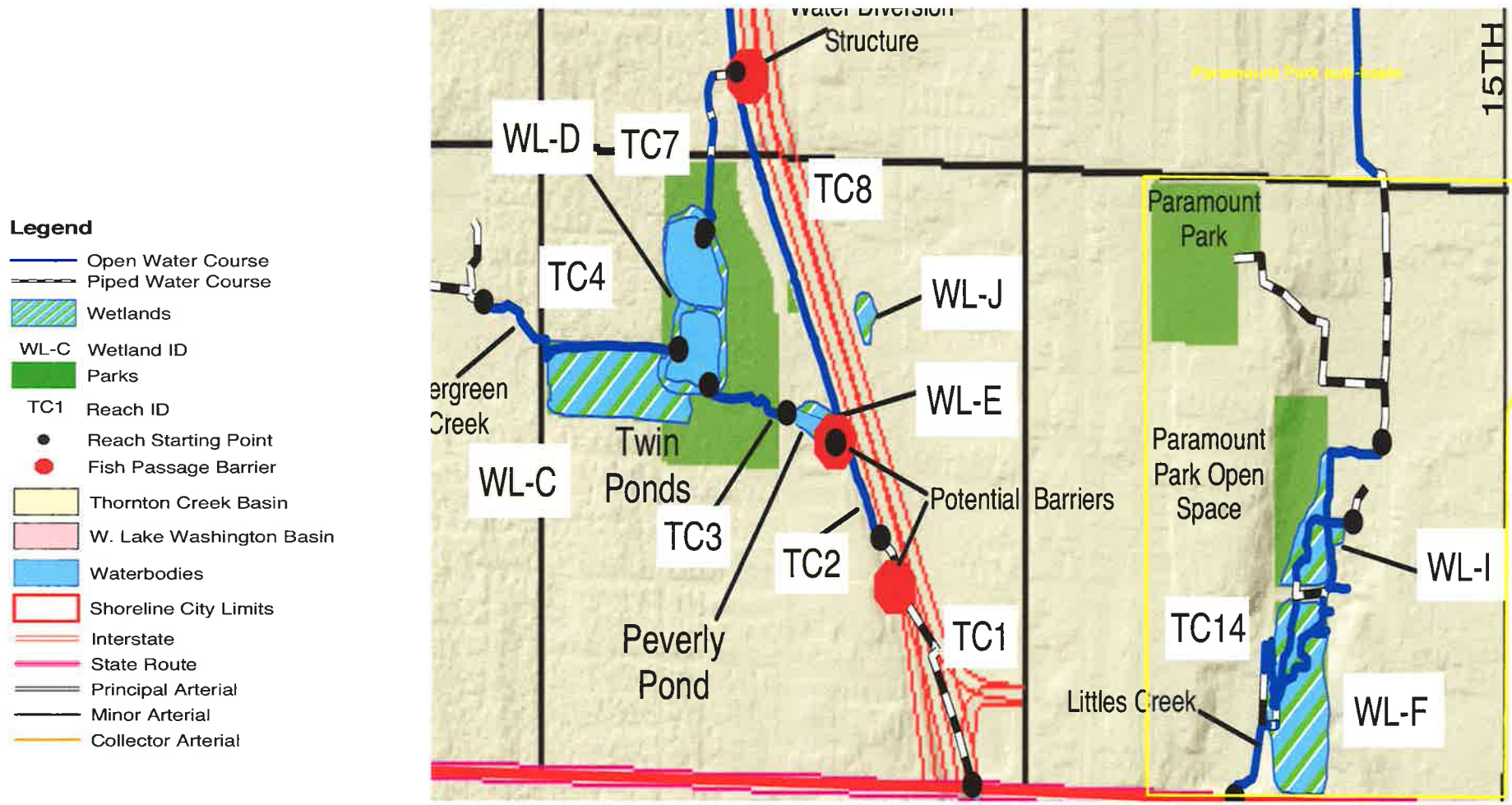


Figure 5: Twin Ponds and Paramount Park Wetlands and Streams

Figure 2-3  
Stream Reaches, Wetlands  
and Fish Passage Barriers

**LEGEND**

**Wetland, New (145th Study) (Otak 2015)**

- II
- III
- Other

**Sensitive Areas**

**Stream**

- F: Contains Fish Habitat
- Np: Perennial Non-fish Habitat
- Ns: Seasonal Non-fish Habitat
- Piped
- Not Typed

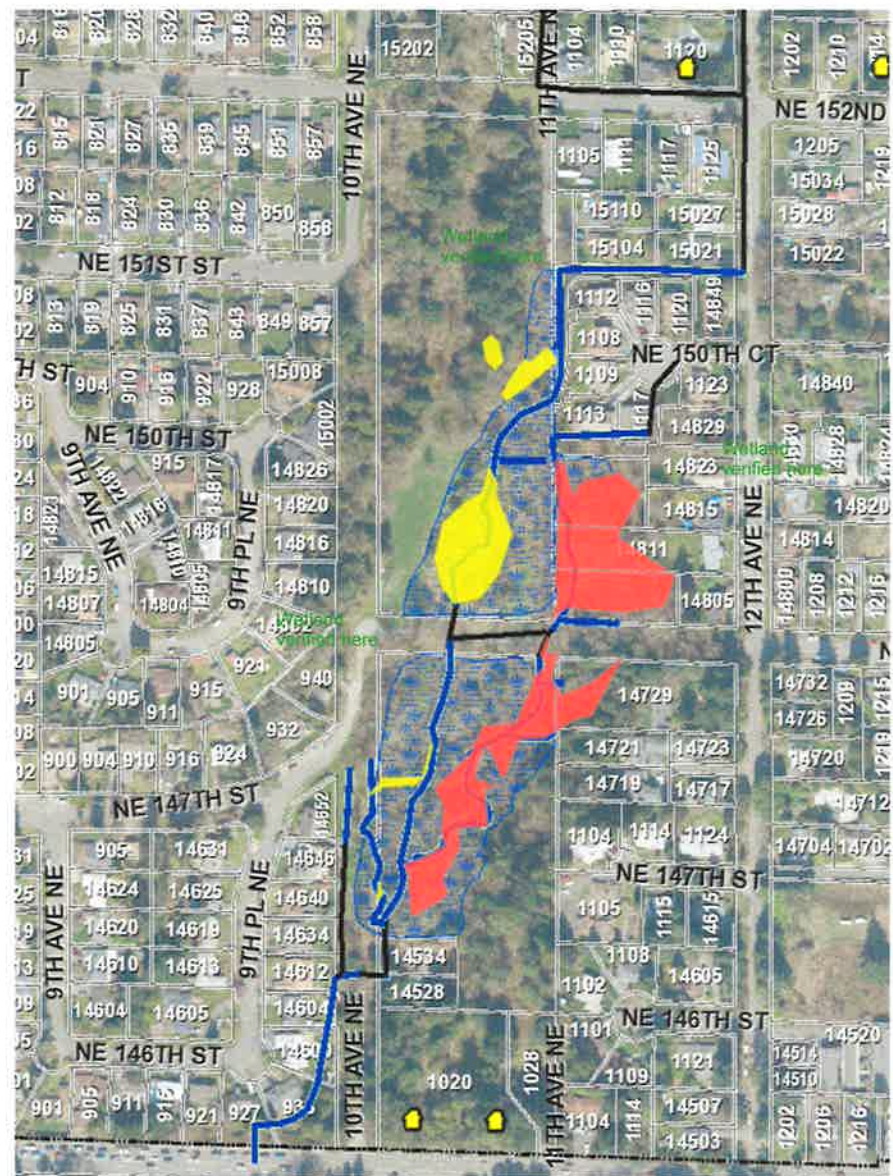
**Wetland (Previously mapped)**

**Slide Hazard soils**

**Tax Parcel**

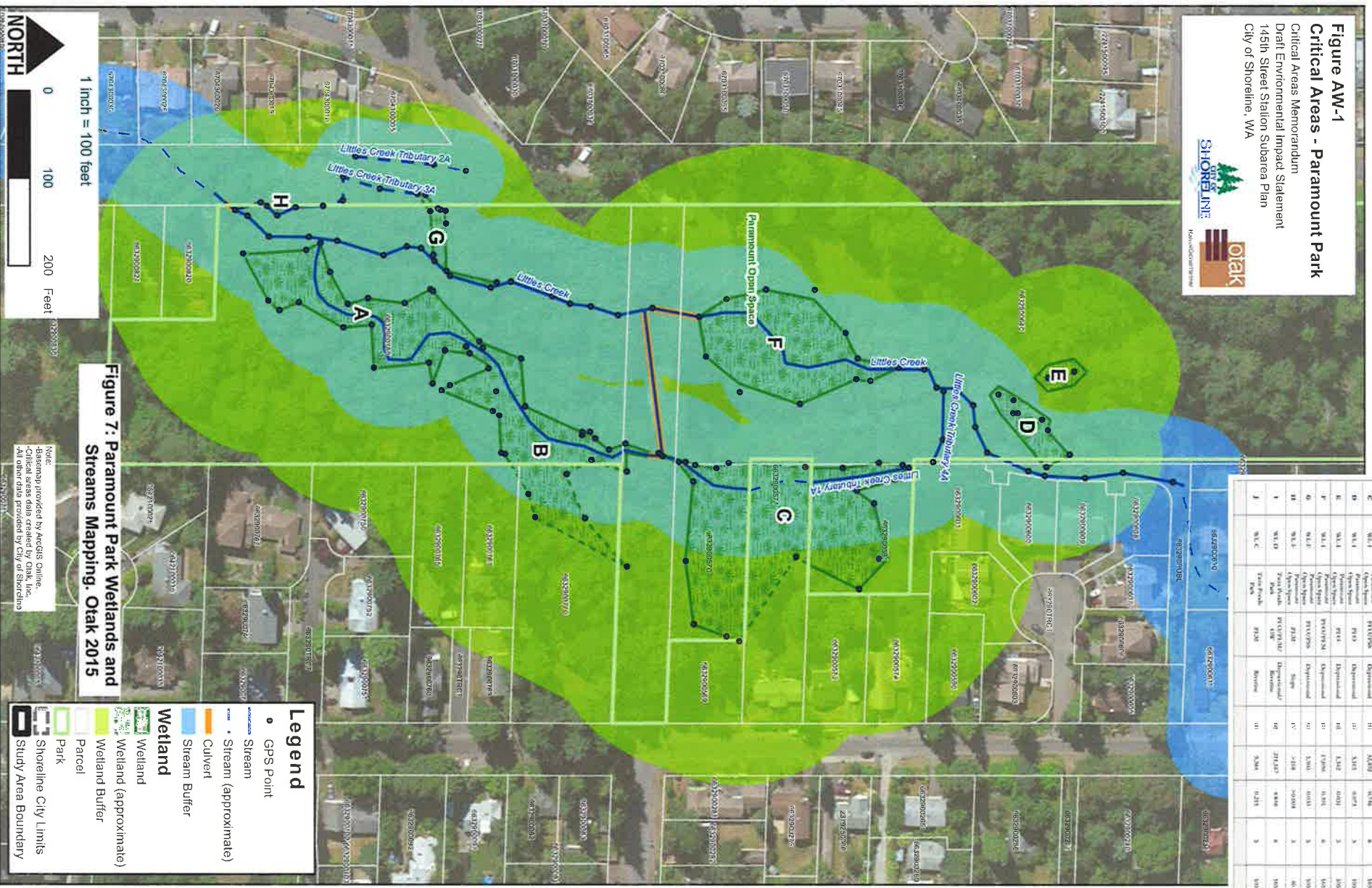
**City Boundary**

**Wetland verified here** Wetland found during the February 2016 Site reconnaissance by Cooke staff (GPS locaitons approximate)



**Figure 6: Paramount Park Wetlands and Streams Mapping, City of Shoreline GIS 2016.**

**Figure AW-1  
Critical Areas - Paramount Park**  
Critical Areas Memorandum  
Draft Environmental Impact Statement  
145th Street Station Subarea Plan  
City of Shoreline, WA



**Figure 7: Paramount Park Wetlands and Streams Mapping, Otak 2015**

Note:  
-dataset provided by ArcGIS Online.  
-Critical areas data created by Otak, Inc.  
-All other data provided by City of Shoreline

Legend	
●	GPS Point
—	Stream
—	Stream (approximate)
—	Culvert
—	Stream Buffer
Wetland	
■	Wetland
■	Wetland (approximate)
■	Wetland Buffer
■	Parcel
■	Park
■	Shoreline City Limits
■	Study Area Boundary

Wetland	Wetland	Location	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland
Map	Inventory		Classification	Code	Area	Area	Area	Area
A	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
B	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
C	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
D	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
E	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
F	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
G	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
H	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
I	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00
J	W.E.1	Paramount Open Space	W.E.1	W.E.1	0.00	0.00	0.00	0.00



Figure 8. Paramount Open Space CSS Site Visit Photo Locations 2016





P1 Lawn part of Wetland WL-1.jpg



P2 car park looking north at Wetland WL-1.jpg



P3 blackberry patch overlying wetland.jpg



P4 upland .jpg



P5 path hedged north through the park..jpg



P6 upland typical.jpg



P7, Wetland in lawn on lot.jpg



P8 tributary and associated wetlands.jpg

# Parkway Land Use Assessment



P9 Tributary tuning corner.jpg



P10 park sign upland.jpg



P11 tributary in ditch along road.jpg



P12 wetland at back of residence.jpg



P13 wetland at back of property.jpg



P14 wetland on next property north.jpg



P15 wetland extends to outbuilding on lot.jpg



P16 wetland downhill of road fill.jpg



P17 tributary into pipe under road and south to restoraitn area.jpg



P18, wetland in lawn area , part of WL-1.jpg



P19 wetland continues north.jpg



P20 tributary from P7 .jpg



Pond and restoraiotn area WL-2.jpg



Pond and restoraton area.jpg



P23 Little Creek continues south through restoraiton areaa.jpg



P24 Pond .jpg



P21behind lot 14652.jpg



P22 fence of Lot 14646.jpg



P25 Littles creek heads south.jpg