HENDERSON PROPERTY

CITY OF TUMWATER, WASHINGTON

CRITICAL AREAS REPORT

Prepared By:

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OPTIMIZE USABLE LAND

27 June 2023

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Table of Contents

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Critical Areas Report is to identify and map Critical Areas on the subject property, satisfying City of Tumwater regulatory requirements under Critical Areas. Potential wetlands, streams, steep slopes, and their buffers were evaluated on the subject property and within three hundred (≤300) feet of the subject property.

1.2 Property Location

The subject property is located in the City of Tumwater, WA (**Figure 1; Table 1**).

Table 1. Subject Property

No#	Address	Parcel Number	Map Coordinates	Area
1	7501 HENDERSON BLVD SE	12711110300	S11 T17N R2W	10
1 Parcel	Total Size			10 acres

The permitting jurisdiction is the City of Tumwater.

1.3 Site Evaluation

A wetland and stream evaluation was performed on the subject property on 15 June 2023

1.4 Site Description

The entire subject property is forested by Douglas fir (*Pseudotsuga menzeisii*, FACU), Big leaf maple (*Acer macrophyllum*, FACU), and red alder (*Alnus rubra*, FAC) with a dense understory of non-wetland plants (**Appendix A, Photos 1 & 2**). Henderson Boulevard SE borders the southeastern property boundary. An off-site large, shallow lake is located at the northwestern property line (**Appendix A, Photos 9 & 10**).

2.0 METHODOLOGY

This report is based on a review of existing information and field investigations. The goal of these efforts is to collect and document existing information that reflects current site conditions for assessing potential impacts.

2.1 Review of Existing Literature

Prior to conducting fieldwork, biologists reviewed existing information to identify wetlands, streams, vegetation patterns, topography, soils, wildlife habitats, and other natural resources on the subject property. Existing data sources that were reviewed for this report included but were not limited to the following:

- Washington. U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Soil Survey
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI), online wetlands mapper
- Washington Department of Fish and Wildlife (WDFW) Salmonscape Database
- Washington Department of Fish and Wildlife (WDFW) Priority and Habitat Species Database
- Washington State Department of Natural Resources (DNR) Natural Heritage Database
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies

2.2 Field Investigation

A wetland evaluation was performed onsite as well as offsite of the subject property to determine if wetlands, streams, or their buffers extend onto the subject property. The routine on-site determination method was used to identify potential wetlands using the procedures outlined in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the 2010 USACE Regional Wetland Supplement.

2.3 Wetland Identification

Prior to 2010, biologists delineated wetlands according to the methods specified in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987). At that time, these methods complied with those in the Washington State Wetland Identification and Delineation Manual (Washington State Department of Ecology [Ecology] 1997).

Following 2010, biologists evaluate wetlands according to the methods specified in the USACE's Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). These methods comply with those adopted by Washington State pursuant to Washington Administrative Code (WAC) 173-22-035, Revised Code of Washington (RCW) 90.58.380.

2.3.1 Vegetation

The dominant plants and their wetland indicator status were evaluated to determine whether the vegetation is hydrophytic. Hydrophytic vegetation is generally defined as vegetation adapted to prolonged saturated soil conditions. To meet the hydrophytic vegetation criterion, more than 50 percent of the dominant plants must be facultative, facultative wetland, or obligate, according to the plant indicator status category assigned to each plant species by the USACE National Wetland Plant List. **Table 2** provides the definitions of the indicator status categories. The scientific and common names for plants follow the currently accepted nomenclature. Dominant plant species were observed and recorded on wetland determination data forms for each data plot (**Appendix L**).

Table 2. Key to Plant Indicator Status Categories

Plant Indicator Status Category	Symbol	Description
Obligate Wetland Plants	OBL	Plants that almost always (>99% of the time) occur in wetlands but may rarely (<1% of the time) occur in non-wetlands
Facultative Wetland Plants	FACW	Plants that often (67% to 99% of the time) occur in wetlands but sometimes (1% to 33% of the time) occur in non-wetlands
Facultative Plants	FAC	Plants with a similar likelihood (33% to 66% of the time) of occurring in both wetlands and non-wetlands
Facultative Upland Plants	FACU	Plants that sometimes (1% to 33% of the time) occur in wetlands but occur more often (67% to 99% of the time) in non-wetlands
Upland Plants	UPL	Plants that rarely (<1% of the time) occur in wetlands and almost always (> 99% of the time) occur in non-wetlands

2.3.2 Soils

Soils were excavated to 18 inches or more below the surface within test pits to evaluate soil characteristics and hydrological conditions throughout the property. Soil chroma (color) is evaluated using the *Munsell Color Chart* (Munsell Color, 1988). Generally, an area must have hydric soils to be considered a wetland. Hydric soil forms when soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper portion. Biological activities in saturated soil result in reduced concentrations of oxygen that in turn result in a preponderance of organisms that use anaerobic processes for metabolism. Over time, anaerobic biological processes result in certain soil color patterns, which are used as indicators of hydric soil. Typically, low-chroma colors are formed in the matrix of hydric soil. Bright-colored redoximorphic features form within the matrix under a fluctuating water table. Other important hydric soil indicators include organic matter accumulations in the surface layer, reduced sulfur odors, and organic matter staining in the subsurface.

2.3.3 Hydrology

The subject property was examined for evidence of hydrology. The U.S. Army Corps of Engineers (2005) provides a technical standard for monitoring hydrology on such sites. This standard requires 14 or more consecutive days of flooding or ponding, or a water table 12 in. (30 cm) or less below the soil surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability). The USACE 2010 Regional Supplement provides a list of hydrology indicators to evaluate whether the hydrology standard is satisfied. If wetland hydrology, including pooling, ponding, and soil saturation, is not clearly evident, hydrological conditions may be observed through surface or soil indicators. Indicators of hydrological conditions include oxidized root channels, drainage patterns, drift lines, sediment deposition, watermarks, historic records, visual observation of saturated soils, and visual observation of inundation.

2.4 Wetland Classification and Rating

Delineated wetlands, if identified, would be classified according to the USFWS Classification of Wetlands and Deepwater Habitats of the United States. Hydrogeomorphic classifications were assigned to wetlands using USACE methods established in 'A Hydrogeomorphic Classification for Wetlands.' Wetlands were rated using the revised Washington State Wetland Rating System for Western Washington.

3.0 STUDY RESULTS

3.1 Background Information

3.1.1 NRCS Soil Survey for Thurston County

Three (3) non-hydric soils were mapped on the subject property by the NRCS Soil Survey (**Table 3; Appendix B**).

Table 3. NRCS Soils Survey

Soil Unit	Hydric	Comments
Indianola loamy sand 3-15% slopes	No	Central portion of the property
Nisqually loamy fine sand 3-15% slopes	No	Northern portion of the property
Indianola loamy sand 0-3% slopes	No	Southern portion of the property

3.1.2 City of Tumwater Critical Areas Database

No wetlands or high groundwater hazard areas are mapped on the subject property by the City of Tumwater GIS database (**Appendix C**). A potential wetland and high groundwater hazard area are mapped northwest of the subject property.

3.1.3 Thurston County Geodata Center Wetlands

A wetland and open water have been mapped northwest of the subject property by the Thurston County Geodata Center database (**Appendix D**). A small portion of this wetland is mapped on the northern corner of the subject property.

3.1.4 Thurston County Geodata Center Contours

The majority of the subject property is mapped relatively flat by the Thurston County Geodata Center database (**Appendix E**). Slopes are mapped on the northwestern edge of the subject property declining approximately ten (10) feet in elevation to off-site water body.

3.1.5 Department of Natural Resources (DNR) Water Typing Database

No streams are mapped on the subject property or within three hundred (≤300) feet of the subject property by the State Department of Natural Resources (DNR) Water Typing Database (**Appendix F**). One (1) off-site Type F stream is located more than three hundred (>300) feet northwest of the subject property.

3.1.6 The WDFW PHS Database

No priority species have been mapped on the subject property by the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) database (**Appendix G**). Wood duck is mapped in a water body northwest of the subject property.

Two (2) off-site wetlands are mapped north and south of the subject property. Mazama pocket gophers are mapped south of the subject property and at the Port of Olympia Airport.

3.1.7 303(d) Water

One (1) 303(d) listed water has been mapped in the Deschutes River greater than one (>1) mile (6,600 feet) downgradient of the water feature north of the subject property (**Appendix H**).

3.1.8 TMDL

TMDL is mapped on the subject property by the Department of Ecology Water Quality Atlas Database (**Appendix I**).

3.1.9 Potential Flooding

An off-site High Groundwater Hazard Area is mapped northwest of the subject property by the Thurston County Geodata Center database (**Appendix J**).

3.2 Field results

A summary of findings is found in **Table 4**.

No wetlands or streams were identified on the subject property during the site evaluation. One (1) wetland, labeled Wetlands A, was identified, and GNSS-located north to northwest of the subject property (**Figures 2 & 3; Appendix A, Photos 5-16**). Wetland A is a very shallow lake containing an aquatic bed and thick scrub-shrub vegetation on the periphery. Wetland A is a shallow depression containing permanent water. An unnamed stream flows into the western portion of Wetland A. A small stream forms an outlet on the western portion of wetland A before flowing to the Deschutes River greater than one (>1) mile (6,600 feet) downgradient.

Table 4. Summary of Critical Areas Results

Wetlands	Area of Wetland		Veg Class Hydroperiod	Buffer Condition	Habitat Features	Comments
	Onsite	Total				
Wetland A	0 sf (0 acre)	790,073 sf (18 acres)	PABH[1] PSSC[2]	Roads, residential, Forest	Logs, snags, Amphibian habitat	Shallow lake dominated by Aquatic bed with scrub shrub periphery

1. PABH: Palustrine Aquatic Bed Permanently-flooded
2. PSSC: Palustrine Scrub-shrub Seasonally-flooded

3.2.1 Wetland A

The Wetland A boundary has been GNSS located at points A-1 through A-16 using a Trimble Geo 7x with sub-foot accuracy (**Figure 4**). No wetland flags were installed because the wetland is located entirely offsite on a property not controlled by the applicant.

Conditions

Wetland A and its buffer are relatively undisturbed.

The Cowardin (1979) classification of Wetland A is (**Table 4**):

- PABH: Palustrine Aquatic Bed Permanently-flooded
- PSSC: Palustrine Scrub-shrub Seasonally-flooded

The wetland boundary on Wetland A is well-defined and consistent throughout.

Greater than ten percent (>10%) of the area within one hundred fifty (150) feet of Wetland A contains potential sources of pollutants (**Figure 7**). Habitat within one (1) kilometer is shown in **Figure 8**. Greater than fifty percent (>50%) of the area within one (1) kilometer of Wetland A consists of high intensity land uses. Based on Thurston County contours, the contributing basin is between ten (10) and one hundred times (10-100x) the size of the wetland (**Figure 8)**.

Hydrology

Hydrology derives from local precipitation, high groundwater, and a small stream. A small stream forms on outlet on the western end of the wetland (**Figure 6**). Water at TP-A1 was saturated to the surface during the site evaluation (**Appendix L**). The majority of the wetland contains permanent ponding.

Vegetation

Two (2) vegetation classes consist of aquatic bed, which covers the main body of the wetland, and of scrub shrub, which occurs as a thin band along the periphery of the wetland (**Figure 6**). The aquatic bed plant species primarily consists of yellow pond lily (*Nuphar polysepalum*, OBL) (**Appendix L**).

The scrub-shrub portion of Wetland A is dominated by Douglas spirea (*Spiraea douglasii*; FACW) and red osier dogwood (*Cornus stolonifera*, FACW) (**Appendix L**).

Areas adjacent to Wetland A are forested by Douglas fir (*Pseudotsuga menzeisii*, FACU), big leaf maple (*Acer macrophyllum*, FACU), and red alder (*Alnus rubra*, FAC) with a dense understory of non-wetland plants. (**Appendix L**).

Dominant plant species identified in the aquatic bed vegetation community in Wetland A include:

- yellow pond lily (*Nuphar polysepalum*, OBL)
- Watershield (*Brasenia schreberi*, OBL)

Dominant plant species identified in the Wetland A scrub shrub vegetation community include:

- Douglas spirea (*Spiraea douglasii*; FACW)
- Red osier dogwood (*Cornus stolonifera*, FACW)
- Himalayan blackberry (*Rubus armeniacus*; FAC)
- Pacific crabapple (*Malus fusca*, FACW)
- Reed canarygrass (*Phalaris arundinacea*, FACW)
- Salmonberry (*Rubus spectabilis*; FAC)
- Vine maple (*Acer circinatum*, FAC)
- Spotted jewelweed (*Impatiens capensis*, FACW)
- Slough sedge (*Carex obnupta*, OBL)
- Skunk cabbage (*Lysichiton americanus*, OBL)
- Field mint (*Mentha arvensis*, FACW)

Dominant buffer plants include:

- Douglas fir (*Pseudotsuga menzeisii*, FACU)
- Big-leaf maple (*Acer macrophyllum*, FACU)
- Red alder (*Alnus rubra*, FAC)
- Bitter cherry (*Prunus emarginata*; FACU)
- Salal (*Gaultheria shallon*, FACU)
- Sword fern (*Polystichum munitum*, FACU)
- Himalayan blackberry (*Rubus armeniacus*; FAC)
- Snowberry (*Physocarpus albus*, FACU)
- Serviceberry (*Amelanchier alnifolia*, FACU)
- Osoberry (*Oemleria cerasiformis*, FACU)
- Mock orange (*Philadelphus lewisii*, NL)
- Beaked hazelnut (*Corylus cornuta*, FACU)
- English laurel (*Prunus laurocerasus*; NL)
- English Ivy (*Hedera helix*, FACU)
- Trailing blackberry (*Rubus ursinus*, FACU)
- Scotch broom (*Cytisus scoparius*, FACU)

Soils

Soils in Wetland A consist of a black (10YR 2/1) sandy muck from zero (0) to twenty (20) inches in depth (**Appendix L**).

Soils adjacent to the wetland consist of a very dark brown (10YR 2/2) sandy silt from zero (0) to twenty (20) inches in depth.

Habitat Features

Habitat features in Wetland A are minimal, but include some minor fallen logs from the buffer area, standing water, and aquatic bed.

4.0 REGULATORY CONSIDERATIONS

Wetland regulatory considerations have been summarized in **Table 5**.

Table 5. Summary of Regulatory Considerations

Wetlands								
Wetland	Area of Wetland		Category	Habitat Score	Total Rating Score	Standard Buffer	Reduced Buffer	Comments
	Onsite	Total						
Wetland A	0 sf (0 acre)	790,073 sf (18 acres)	III	6 (MLH)	19	150 ft	110 ft	Wetland buffers can be reduced from 150’ to 110’.

4.1 Wetlands

4.1.1 Wetland A

Wetland A has been classified as a Category III wetland by the Department of Ecology (2014) Wetland Rating Form for Western Washington as required under Chapter 16.28.090---*Wetlands Rating System*. Wetland A is a depressional wetland under the 2014 Department of Ecology Wetland Rating System.

Under City of Tumwater Municipal Code (TMC) Title 16---*Environment*, Chapter 16.28.090---*Wetlands Rating System*, wetland buffers are calculated based on category of wetland and the habitat score determined by the Washington State Department of Ecology (2014) Wetland Rating System publication 14-06-029, effective January 2015), as revised. Wetland A scored for habitat a “Medium (M)” potential to provide habitat, a “Low (L)” landscape potential to support habitat, and a “High (H)” potential value to society. Wetlands that rate as an M, L, H receive a score of six (6) points for total habitat functions (**Appendix K**).

The standard buffer for Category III wetlands that score between five (5) and Seven (7) points for Habitat Functions require a buffer width of one hundred fifty (150) feet (TMC Chapter 16.28.170---*Wetland buffers*, Table 16.28.170(2)---*Category II Wetland Buffer Widths*) (**Figure 5, Table 5**).

The one hundred fifty (150)-foot buffer on Wetland A could be reduced to one hundred ten (110) feet pursuant to compliance with criteria under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction* (See Section 4.3 of this report).

4.2 Wetland Buffer Reduction (TCC 16.28.170(C))

Under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction*, the buffer widths recommended for land uses with high-intensity impacts to wetlands can be reduced to those widths recommended for moderate-intensity impacts under the following conditions:

1. For wetlands that score moderate or high for habitat (five [5] points or more), the width of the buffer around the wetland can be reduced if both the following criteria are met:
    a. A relatively undisturbed vegetated corridor at least one hundred feet wide is protected between the wetland and any other priority habitats as defined by the Washington State Department of Fish and Wildlife. The corridor must be protected for the entire distance between the wetland and the priority habitat via some type of legal protection such as a conservation easement; and
    b. Measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5), are applied.

Table 16.28.170(5): Measures to Minimize Impacts to Wetlands

Examples of Disturbance	Examples of Measures to Minimize Impacts	Activities That Cause the Disturbance
Lights	Direct lights away from wetland	Parking lots, warehouses, manufacturing, residential
Noise	Locate activity that generates noise away from wetland	Manufacturing, residential
Toxic runoff (1)	*Route all new runoff away from wetland while ensuring that wetland is not dewatered *Establish covenants limiting use of pesticides within 150 ft of wetland *Apply integrated pest management	Parking lots, roads, manufacturing, residential areas, application of agricultural pesticides, landscaping
Stormwater runoff	*Retrofit stormwater detention and treatment for roads and existing adjacent development *Prevent channelized flow from lawns that directly enters the buffer	Parking lots, roads, manufacturing, residential areas, commercial, landscaping
Change in water regime	Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns	Impermeable surfaces, lawns, tilling
Pets and human disturbance	*Use privacy fencing *Plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion *Place wetland and its buffer in a separate tract	Residential areas
Dust	Utilize best management practices to control dust	Tilled fields

The proposed project would reduce buffers in compliance with TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction* by 1) reducing the high land use intensity buffer to the moderate land use intensity, 2) protect a relatively undisturbed vegetated corridor at least one hundred (≥100) feet wide, and by 3) applying measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5).

4.3 Buffer Averaging

Under TMC 16.28.170(E)---*Standard Wetland Buffer Width Averaging*, standard wetland buffer zones may be modified by averaging buffer widths if it will improve the protection of wetland functions, or if it is the only way to allow for reasonable use of a parcel. Averaging cannot be used in conjunction with the provisions for reductions in buffer widths. Wetland buffer width averaging shall be allowed to improve wetland protection only where a qualified wetlands professional demonstrates all of the following:

1. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a "dual-rated" wetland with a category I area adjacent to a lower rated area;
2. The buffer is increased adjacent to the higher functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower functioning or less sensitive portion;
3. The total area contained in the buffer area after averaging is not less than that which would be contained within the standard buffer; and
4. The buffer at its narrowest point is never less than three-fourths of the required width.

4.4 Permitted Uses in a Wetland Buffer Zone

Under TMC 16.28.170(H)---Permitted Uses in a Wetland Buffer Zone. Regulated activities shall not be allowed in a buffer zone except for the following:

1. Activities having minimal adverse impacts on buffers and no adverse impacts on regulated wetlands. These may include low-intensity, passive recreational activities such as pervious trails, nonpermanent wildlife watching blinds, short-term scientific or educational activities, and sports fishing or hunting.
2. With respect to category III and IV wetlands, surface level stormwater management facilities may be allowed in the outer twenty-five percent of the wetland buffer using best management practices; provided the community development director makes all of the following determinations:
    a. No other location is feasible.
    b. The location of such facilities will not degrade the functions or values of the wetland.
3. Stormwater management facilities are not allowed in buffers of category I or II wetlands.

Under TMC 16.28.170(I)---*Signs and Fencing of Wetlands*:

1. Temporary Markers.

    The outer perimeter of the wetland or buffer and the limits of those areas to be disturbed pursuant to an approved permit or authorization shall be marked in the field in such a way as to ensure that no unauthorized intrusion will occur and is subject to inspection by the community development director prior to the commencement of permitted activities. This temporary marking shall be maintained throughout construction and shall not be removed until permanent signs, if required, are in place.

2. Permanent Signs.

   As a condition of any permit or authorization issued pursuant to these requirements, the community development director may require the applicant to install permanent signs along the boundary of a wetland or buffer. Permanent signs shall be made of an enamel coated metal face and attached to a metal post, or another untreated material of equal durability. Signs must be posted at an interval of one per lot or every fifty feet, whichever is less, and must be maintained by the property owner in perpetuity. The sign shall be worded as follows or with alternative language approved by the community development director:

   Protected Wetland Area

   Do Not Disturb

   Contact Tumwater Community Development 754-4180

   Regarding Uses and Restrictions

3. Fencing.

   The community development director shall determine if fencing is necessary to protect the functions and values of the critical area. If found to be necessary, the community development director shall condition any permit or authorization issued pursuant to these regulations to require the applicant to install a permanent fence at the edge of the wetland buffer, when fencing will prevent future impacts to the wetland. The applicant will be required to install a permanent fence around the wetland or buffer when domestic grazing animals are present or may be introduced on site.

4.5 Avoiding Wetland Impacts

Under TMC 16.28.180---*Avoiding wetland impacts*:

A. Regulated activities shall not be authorized in a regulated wetland or wetland buffer except where it can be demonstrated that the impact is both unavoidable and necessary or that all reasonable economic uses are denied.

B. With respect to category I wetlands, an applicant must demonstrate that denial of the permit would impose an extraordinary hardship on the part of the applicant brought about by circumstances peculiar to the subject property.

C. With respect to category II and III wetlands, the following provisions shall apply:

   1. For water-dependent activities, unavoidable and necessary impacts can be demonstrated where there are no practicable alternatives which would not involve a wetland or which would not have less adverse impact on a wetland, and would not have other significant adverse environmental consequences;

   2. Where non-water-dependent activities are proposed, it shall be presumed that adverse impacts are avoidable. This presumption may be rebutted upon a demonstration that:

      a. The basic project purpose cannot reasonably be accomplished utilizing one or more other sites in the general region that would avoid, or result in less, adverse impact on a regulated wetland;

b. A reduction in the size, scope, configuration, or density of the project as proposed and all alternative designs of the project as proposed that would avoid, or result in less, adverse impact on a regulated wetland or its buffer will not accomplish the basic purpose of the project; and

c. In cases where the applicant has rejected alternatives to the project as proposed due to constraints such as zoning, deficiencies of infrastructure, or parcel size, the applicant has made reasonable attempt to remove or accommodate such constraints.

D. With respect to category IV wetlands, unavoidable and necessary impacts can be demonstrated where the proposed activity is the only reasonable alternative which will accomplish the applicant's objectives.

E. If the city determines that alteration of a wetland and/or wetland buffer is necessary and unavoidable, the city shall set forth in writing its findings with respect to each of the items listed in this section.

4.6 Conditions for Wetland Permits

Under TMC 16.28.210---Acting on the application:

A. Land Division Conditions for Wetland Permits.

1. Sensitive Area Tracts/Easements.

As a condition of any permit issued pursuant to this section, the permit holder shall be required to create a separate sensitive area tract(s)/easement(s) containing the areas determined to be wetland and/or wetland buffer in field investigations performed pursuant to TMC 16.28.080. Sensitive area tracts/easements are legally created tracts/easements containing wetlands and their buffers that shall remain undeveloped as long as wetland functions and values are present. Loss of wetland functions due to human impacts will result in sensitive area tracts/easements being maintained.

a. Protection of Sensitive Area Tracts/Easements.

The city shall require, as a condition of any permit issued pursuant to this section, that the sensitive area tract or tracts created pursuant to this section be protected by one of the following methods:

i. The permit holder shall convey an irrevocable offer to dedicate to the city of Tumwater or other public or nonprofit entity specified by the city an easement for the protection of native vegetation within a wetland and/or its buffer; or

ii. The permit holder shall establish and record a permanent and irrevocable deed restriction on the property title of all lots containing a sensitive area tract or tracts created as a condition of this permit. Such deed restriction(s) shall prohibit, as long as wetland function exists, the development, alteration, or disturbance of vegetation within the sensitive area except for purposes of habitat enhancement as part of an enhancement project which has received prior written approval from the city of Tumwater, and any other agency with jurisdiction over such activity.

2. The deed restriction shall also contain the following language:

    a. "Before, beginning, and during the course of any grading, building construction, or other development activity on a lot or development site subject to this deed restriction, the common boundary between the area subject to the deed restriction and the area of development activity must be fenced or otherwise marked to the satisfaction of City of Tumwater."

    b. Regardless of the legal method of protection chosen by the city, responsibility for maintaining tracts shall be held by a property owner's association, adjacent lot owners, the permit applicant or designee, or other appropriate entity as approved by the city.

    c. The following note shall appear on the face of all plats, short plats, PUDs, or other approved site plans containing separate sensitive area tracts/easements, and shall be recorded on the title of record for all affected lots:

NOTE: All lots adjoining separate sensitive areas identified as Native Vegetation Protection Easements or protected by deed restriction are responsible for maintenance and protection. Maintenance includes insuring that no alterations occur within the separate tract and that all vegetation remains undisturbed unless the express written authorization of the City of Tumwater has been received.

The common boundary between a separate sensitive area tract/easement and the adjacent land must be permanently identified. This identification shall include permanent wood or metal signs on treated or metal posts.

Sign locations and size specifications shall be approved by the city. The city shall require permanent fencing of the sensitive area when there is a substantial likelihood of the presence of domestic grazing animals within the development proposal. The city shall also require as a permit condition that such fencing be provided if, subsequent to approval of the development proposal, domestic grazing animals are in fact introduced.

3. Additional Conditions.

    a. The location of the outer extent of the wetland buffer and the areas to be disturbed pursuant to an approved permit shall be marked in the field, and such field marking shall be approved by the city prior to the commencement of permitted activities. Such field markings shall be maintained throughout the duration of the permit.

    b. The city may attach such additional conditions to the granting of a wetland permit as deemed necessary to assure the preservation and protection of affected wetlands and to assure compliance with the purposes and requirements of this chapter.

B. Bonding.

1. Performance Bonds.

The city may require the applicant of a development proposal to post a cash performance bond or other security acceptable to the city in an amount and with surety and conditions

sufficient to fulfill the requirements of this section. In addition, the city may secure compliance with other conditions and limitations set forth in the permit. The amount and the conditions of the bond shall be consistent with the purposes of this chapter. In the event of a breach of any condition of any such bond, the city may institute an action in a court of competent jurisdiction upon such bond and prosecute the same to judgment and execution. The city shall release the bond upon determining that:

a. All activities, including any required compensatory mitigation, have been completed in compliance with the terms and conditions of the permit and the requirements of this chapter;

b. Upon the posting by the applicant of a maintenance bond.

Until such written release of the bond, the principal or surety cannot be terminated or canceled.

2. Maintenance Bonds.

The city may require the holder of a wetland permit issued pursuant to this chapter to post a cash performance bond or other security acceptable to the city in an amount and with surety and conditions sufficient to guarantee that structures, improvements, and mitigation required by the permit or by this chapter perform satisfactorily for a minimum of two years after they have been completed. The city shall release the maintenance bond upon determining that performance standards established for evaluating the effectiveness and success of the structures, improvements, and/or compensatory mitigation have been satisfactorily met for the required period. For compensation projects, the performance standards shall be those contained in the mitigation plan developed and approved during the permit review process to TMC 16.28.220. The maintenance bond applicable to a compensation project shall not be released until the city determines that performance standards established for evaluating the effect and success of the project have been met.

C. Other Laws and Regulations.

No permit granted pursuant to this chapter shall remove an applicant’s obligation to comply in all respects with the applicable provisions of any other federal, state, or local law or regulation, including but not limited to the acquisition of any other required permit or approval.

D. Suspension, Revocation.

In addition to other penalties provided for elsewhere, the city may suspend or revoke a permit if it finds that the applicant or permittee has not complied with any or all of the conditions or limitations set forth in the permit, has exceeded the scope of work set forth in the permit, or has failed to undertake the project in the manner set forth in the approved application.

4.7 Compensating for Wetland Impacts

Under TMC 16.28.220---*Compensating for wetlands impacts*:

A. As a condition of any permit allowing alteration of wetland and/or wetland buffers, or as an enforcement action pursuant to TMC 16.28.280, the city shall require that the applicant demonstrate that wetland impact avoidance is not possible and engage in the restoration, creation or enhancement of wetlands and their buffers in order to offset the impacts resulting from the applicant's or violator's actions. Mitigation for alterations to wetlands shall achieve equivalent or greater biologic functions. Mitigation plans shall be consistent with the Washington State Department of Ecology "Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans," 2006, as revised. The applicant shall develop a plan that provides for land acquisition, construction, maintenance and monitoring of replacement wetlands that recreate as nearly as possible the original wetlands in terms of acreage, function, geographic location and setting, and that are larger than the original wetlands. Compensatory mitigation shall be completed prior to wetland destruction, where possible. Mitigation shall result in no net loss of wetlands function and acreage and seeks a net resource gain in wetlands over present conditions with the exception of enforcement actions.

B. Mitigation actions shall address functions affected by the alteration in order to achieve functional equivalency or improvement and shall provide similar wetland functions as those lost except when the lost wetland provides minimal functions as determined by a site-specific function assessment and the proposed mitigation action(s) will provide equal or greater functions.

C. Mitigation actions that require compensation mitigation by replacing, enhancing, or substitution shall occur in the following order of preference:

    1. Restoring wetlands on upland sites that were formerly wetlands.

    2. Creating wetlands on disturbed upland sites such as those with vegetative cover consisting primarily of nonnative introduced species. This should only be attempted when there is a consistent source of hydrology and it can be shown that the surface and subsurface hydrologic regime is conducive for the wetland community that is being designed.

    3. Enhancing significantly degraded wetlands in combination with restoration or creation. Such enhancement should be part of a mitigation package that includes replacing the impacted area meeting appropriate ratio requirements.

D. Mitigation actions shall be conducted within the same subdrainage basin and on the same site as the alteration except when all of the following apply:

    1. There are no reasonable on-site or in-subdrainage-basin opportunities or on-site and in-subdrainage-basin opportunities do not have a high likelihood of success due to development pressures, adjacent land uses, or on-site buffers or connectivity are inadequate;

    2. Off-site mitigation has a greater likelihood of providing equal or improved wetland functions than the impacted wetland; and

3. Off-site locations shall be in the same subdrainage basin and the same water resource inventory area unless:

   a. The impact is located near the boundary of a water resource inventory area;

   b. Established regional or watershed goals for water quality, flood or conveyance, habitat or other wetland functions have been established and strongly justify location of mitigation at another site; or

   c. Credits from a state certified wetland mitigation bank are used as mitigation and the use of credits is consistent with the terms of the bank's certification.

E. Mitigation projects, where feasible, shall be completed prior to activities that will disturb wetlands. In all other cases, mitigation shall be completed immediately following disturbance and prior to use or occupancy of the activity or development. Construction of mitigation projects shall be timed to reduce impacts to existing wildlife and flora. The community development director may authorize a one-time temporary delay, up to one hundred twenty days, in completing minor construction and landscaping when environmental conditions could produce a high probability of failure or significant construction difficulties. The delay shall not create or perpetuate hazardous conditions or environmental damage or degradation, and the delay shall not be injurious to the health, safety and general welfare of the public. The request for temporary delay must include a written justification that documents the environmental constraints that preclude implementation of the mitigation plan. The justification must be verified and approved by the city and include a financial guarantee.

F. Surface Area Replacement Ratio. The ratios in Table 16.28.220(6) apply to creation or restoration which is in kind, on site, timed prior to or concurrent with alteration, and has a high probability of success. These ratios do not apply to remedial actions resulting from illegal alterations. The first number specifies the area of wetlands requiring replacement and the second specifies the area of wetlands altered.

   The ratios in Table 16.28.220(6) are based on the type of compensatory mitigation proposed, such as restoration, creation, and enhancement. In its Regulatory Guidance Letter 02-02, the U.S. Army Corps of Engineers provided definitions for these types of compensatory mitigation, which the Washington State Department of Ecology used in their Guidance on Buffers and Ratios for Western Washington as part of the Wetlands in Washington State Volume 2 – Protecting and Managing Wetlands in October 2014 and are provided below.

   1. Restoration.

      The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into two categories:

      a. Reestablishment.

         The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former wetland. Reestablishment results in a gain in wetland acres (and functions). Activities could include removing fill material, plugging ditches, or breaking drain tiles.

b. Rehabilitation.

The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or return tidal influence to a wetland.

2. Creation (Establishment).

The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deep-water site where a wetland did not previously exist. Establishment results in a gain in wetland acres. Activities typically involve excavation of upland soils to elevations that will produce a wetland hydroperiod, create hydric soils, and support the growth of hydrophytic plant species.

3. Enhancement.

The manipulation of the physical, chemical, or biological characteristics of a wetland site to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in some wetland functions and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Activities typically consist of planting vegetation, controlling non-native or invasive species, modifying site elevations or the proportion of open water to influence hydroperiods, or some combination of these activities.

Table 16.28.220(6): Mitigation Ratios for Projects in Western Washington

Category and Type of Wetland Impacts (1)	Reestablishment or Creation	Rehabilitation (2)	Enhancement (2)
Category I – bogs or wetlands of high conservation value	Not considered possible (3)	6:1	Case-by-case
Category I – mature forested	6:1	12:1	24:1
Category I based on score for functions	4:1	8:1	16:1
All category II	3:1	6:1	12:1
All category III	2:1	4:1	8:1
All category IV	1.5:1	3:1	6:1

Table 16.28.220(6) Explanatory Notes:

(1) Preservation is discussed in subsection J of this section.

(2) These ratios are based on the assumption that the rehabilitation or enhancement actions implemented represent the average degree of improvement possible for the site. Proposals to implement more effective rehabilitation or enhancement actions may result in a lower ratio, while less effective actions may result in a higher ratio. The distinction between rehabilitation and enhancement is not clear-cut. Instead, rehabilitation and enhancement actions span a continuum. Proposals that fall within the gray area between rehabilitation and enhancement will result in a ratio that lies between the ratios for rehabilitation and the ratios for enhancement.

(3) Wetlands of high conservation value and bogs are considered irreplaceable wetlands because they perform some special functions that cannot be replaced through compensatory mitigation. Impacts to such wetlands would therefore result in a net loss of some functions no matter what kind of compensation is proposed.

4. Increased Replacement Ratio. The city may increase the ratios under any of the following circumstances:

   a. Uncertainty as to the probable success of the proposed restoration or creation;

   b. Significant period of time between destruction and replication of wetland functions at the mitigation site;

   c. Proposed mitigation will result in a lower category wetland or reduced functions relative to the wetland being impacted; or

   d. The impact was unauthorized.

5. Decreased Replacement Ratio.

The city may decrease these ratios for category II, III, and IV wetlands under the following circumstances:

   a. Documentation by a qualified wetlands specialist demonstrates that the proposed mitigation actions have a very high likelihood of success based on prior experience;

   b. Documentation by a qualified wetlands specialist demonstrates that the proposed mitigation actions will provide functions and values that are significantly greater than the wetland being impacted;

   c. The proposed mitigation actions are conducted in advance of the impact and have been shown to be successful.

6. In wetlands where several hydrogeomorphic classes are found within one delineated boundary, the areas of the wetlands within each hydrogeomorphic class can be scored and rated separately and the ratios adjusted accordingly, if all of the following apply:
    a. The wetland does not meet any of the criteria for wetlands with "special characteristics" as defined in the rating system;
    b. The rating and score for the entire wetland are provided along with the scores and ratings for each area with a different hydrogeomorphic class;
    c. Impacts to the wetland are all within an area that has a different hydrogeomorphic class from the one used to establish the initial category; and
    d. The proponents provide adequate hydrologic and geomorphic data to establish that the boundary between hydrogeomorphic classes lies at least fifty feet outside of the footprint of the impacts.
7. In all cases, a minimum acreage replacement ratio of one-to-one shall be required.

G. Replacement Ratios for Temporal Impacts and Conversions.

1. When impacts to wetlands are not permanent, the city will require compensation for the temporal loss of wetland functions. Temporal impacts refer to impacts to those functions that will eventually be replaced but cannot achieve similar functionality in a short time.
2. In addition to restoring the affected wetland to its previous condition, the city will require compensation to account for the risk and temporal loss of wetland functions. The ratios for temporal impacts to forested and scrub-shrub wetlands are one-quarter of the recommended ratios for permanent impacts found in Table 16.28.220(6); provided, that the following measures are satisfied:
    a. An explanation of how hydric soil, especially deep organic soil, is stored and handled in the areas where the soil profile will be severely disturbed for a fairly significant depth or time;
    b. Surface and groundwater flow patterns are maintained or can be restored immediately following construction;
    c. A ten-year monitoring and maintenance plan is developed and implemented for the restored forest and scrub-shrub wetlands;
    d. Disturbed buffers are revegetated and monitored; and
    e. Where appropriate, the hydroseed mix to be applied on reestablishment areas is identified.
3. When impacts are to a native emergent community and there is a potential risk that its reestablishment will be unsuccessful, compensation for temporal loss and the potential risk will be required in addition to restoring the affected wetland and monitoring the site. If the impacts are to wetlands dominated by nonnative vegetation, such as blackberry, reed canarygrass, or pasture grasses, restoration of the affected wetland with native species and monitoring after construction is required.

4. Loss of functions due to the permanent conversion of wetlands from one type to another requires compensation. When wetlands are not completely lost but are converted to another type, such as a forested wetland converted to an emergent or shrub wetland, such as for a utility right-of-way, some functions are lost or reduced.

5. The ratios for conversion of wetlands from one type to another will vary based on the degree of the alteration, but they are generally one-half of the recommended ratios for permanent impacts found in Table 16.28.220(6).

H. Wetlands Enhancement.

1. Any applicant proposing to alter wetlands may propose to enhance existing significantly degraded wetlands in order to compensate for wetland losses. Applicants proposing to enhance wetlands must produce a critical area report that identifies how enhancement will increase the functions of the degraded wetland and how this increase will adequately mitigate for the loss of wetland area and function at the impact site. An enhancement proposal must also show whether existing wetland functions will be reduced by the enhancement actions.

2. A wetlands enhancement compensation project shall be determined pursuant to this section; provided, that enhancement for one function and value will not degrade another function or value and that acreage replacement ratios shall be in accordance with Table 16.28.220(6).

I. Wetland Type.

In-kind compensation shall be provided except where the applicant can demonstrate that:

1. The wetland system is already significantly degraded and out-of-kind replacement will result in a wetland with greater functional value;

2. Scientific problems such as exotic vegetation and changes in watershed hydrology make implementation of in-kind compensation impossible;

3. Out-of-kind replacement will best meet identified regional goals, such as replacement of historically diminished wetland types;

4. Where out-of-kind replacement is accepted, greater acreage replacement ratios may be required to compensate for lost functional values.

J. Wetland Preservation as Mitigation.

Impacts to wetlands may be mitigated by preservation of wetland areas, in a separate tract or easement when used in combination with other forms of mitigation such as creation, restoration, or enhancement at the preservation site or at a separate location. Preservation may also be used by itself, but more restrictions as outlined below will apply.

Preservation as mitigation is acceptable when done in combination with restoration, creation, or enhancement providing that a minimum of one-to-one acreage replacement is provided by restoration or creation and the criteria below are met:

1. The impact area is small, and impacts are to a category III or IV wetland;
2. Preservation of a high-quality system occurs in the same water resource inventory area or watershed basin as the wetland impact;
3. Acceptable sites for preservation include those that are important due to their landscape position, are rare or limited wetland types, and provide high levels of functions;
4. Preservation sites include buffer areas adequate to protect the habitat and its functions from encroachment and degradation; and
5. Mitigation ratios for preservation in combination with other forms of mitigation shall range from ten-to-one to twenty-to-one, as determined on a case-by-case basis by the city, depending on the quality of the wetlands being mitigated and the quality of the wetlands being preserved. Specific ratios will depend upon the significance of the preservation project and the quality of the wetland resources lost.

K. Cooperative Restoration, Creation or Enhancement Projects.

1. The city may encourage, facilitate, and approve cooperative projects wherein a single applicant or other organization with demonstrated capability may undertake a compensation project with funding from other applicants under the following circumstances:
   a. Restoration, creation, or enhancement at a particular site may be scientifically difficult or impossible; or
   b. Creation of one or several larger wetlands may be preferable to many small wetlands.
2. Persons proposing cooperative compensation projects shall:
   a. Submit a joint permit application;
   b. Demonstrate compliance with all standards;
   c. Demonstrate the organizational and fiscal capability to act cooperatively; and
   d. Demonstrate that long-term management can and will be provided.

5.0 LAND USE ACTION

No land use action is proposed in this report.

Although no Critical Areas were identified on the subject property, a wetland buffer extends onto the subject property from the off-site Wetland A. The wetland buffer would cover an area of approximately fifty-four thousand four hundred thirty (~54,430) sf (~1.25 acres) of the subject property. Area outside of wetlands and buffers totals approximately eight and three-fourths (~8.75) acres of the ten (10) acre subject property. These estimates are not based on a survey, rather the estimates are measured using the Thurston County parcel GIS layer.

With respect to category III and IV wetlands, surface level stormwater management facilities may be allowed in the outer twenty-five percent of the wetland buffer using best management practices; provided the community development director makes all of the following determinations:

a. No other location is feasible.

b. The location of such facilities will not degrade the functions or values of the wetland.

Under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction*, the buffer widths recommended for land uses with high-intensity impacts to wetlands can be reduced to those widths recommended for moderate-intensity impacts under the following conditions:

1. For wetlands that score moderate or high for habitat (five [5] points or more), the width of the buffer around the wetland can be reduced if both the following criteria are met:

    a. A relatively undisturbed vegetated corridor at least one hundred feet wide is protected between the wetland and any other priority habitats as defined by the Washington State Department of Fish and Wildlife. The corridor must be protected for the entire distance between the wetland and the priority habitat via some type of legal protection such as a conservation easement; and

    b. Measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5), are applied.

The proposed project would reduce buffers in compliance with TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction* by:

1) Reducing the high land use intensity buffer to the moderate land use intensity,

2) Protect a relatively undisturbed vegetated corridor at least one hundred (≥100) feet wide, and by

3) Applying measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5).

Under TMC 16.28.170(E)---*Standard Wetland Buffer Width Averaging*, standard wetland buffer zones may be modified by averaging buffer widths if it will improve the protection of wetland functions, or if it is the only way to allow for reasonable use of a parcel. Averaging cannot be used in conjunction with the provisions for reductions in buffer widths. Wetland buffer width averaging shall be allowed to improve wetland protection only where a qualified wetlands professional demonstrates all of the following:

1. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a "dual-rated" wetland with a category I area adjacent to a lower rated area;

2. The buffer is increased adjacent to the higher functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower functioning or less sensitive portion;

3. The total area contained in the buffer area after averaging is not less than that which would be contained within the standard buffer; and

4. The buffer at its narrowest point is never less than three-fourths of the required width.

9.0 SUMMARY & CONCLUSION

The purpose of this Critical Areas Report is to identify and map Critical Areas on the subject property, satisfying City of Tumwater regulatory requirements under Critical Areas. Potential wetlands, streams, steep slopes, and their buffers were evaluated on the subject property and within three hundred (≤300) feet of the subject property.

The entire subject property is forested by Douglas fir (*Pseudotsuga menzeisii*, FACU), Big leaf maple (*Acer macrophyllum*, FACU), and red alder (*Alnus rubra*, FAC) with a dense understory of non-wetland plants (**Appendix A, Photos 1 & 2**). Henderson Boulevard SE borders the southeastern property boundary. An off-site large, shallow lake is located at the northwestern property line (**Appendix A, Photos 9 & 10**).

No wetlands or streams were identified on the subject property during the site evaluation. One (1) wetland, labeled Wetlands A, was identified, and GNSS-located north to northwest of the subject property (**Figures 2 & 3; Appendix A, Photos 5-16**). Wetland A is a very shallow lake containing an aquatic bed and thick scrub shrub vegetation on the periphery. Wetland A is a shallow depression containing permanent water. An unnamed stream flows into the western portion of Wetland A. A small stream forms an outlet on the western portion of wetland A before flowing to the Deschutes River greater than one (>1) mile (6,600 feet) downgradient.

Wetland A has been classified as a Category III wetland by the Department of Ecology (2014) Wetland Rating Form for Western Washington as required under Chapter 16.28.090---*Wetlands Rating System*. Wetland A is a depressional wetland under the 2014 Department of Ecology Wetland Rating System.

Under City of Tumwater Municipal Code (TMC) Title 16---*Environment*, Chapter 16.28.090---*Wetlands Rating System*, wetland buffers are calculated based on category of wetland and the habitat score determined by the Washington State Department of Ecology (2014) Wetland Rating System publication 14-06-029, effective January 2015), as revised. Wetland A scored for habitat a "Medium (M)" potential to provide habitat, a "Low (L)" landscape potential to support habitat, and a "High (H)" potential value to society. Wetlands that rate as an M, L, H receive a score of six (6) points for total habitat functions (**Appendix K**).

The standard buffer for Category III wetlands that score between five (5) and Seven (7) points for Habitat Functions require a buffer width of one hundred fifty (150) feet (TMC Chapter 16.28.170---*Wetland buffers*, Table 16.28.170(2)---*Category II Wetland Buffer Widths*) (**Figure 5, Table 2**).

The one hundred fifty (150)-foot buffer on Wetland A could be reduced to one hundred ten (110) feet pursuant to compliance with criteria under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction* (See Section 4.3 of this report).

No land use action is proposed in this report.

Although no Critical Areas were identified on the subject property, a wetland buffer extends onto the subject property from the off-site Wetland A. The wetland buffer would cover an area of approximately fifty-four thousand four hundred thirty (~54,430) sf (~1.25 acres) of the subject property. Area outside of wetlands and buffers totals approximately eight and three-fourths (~8.75) acres of the ten (10) acre subject property. These estimates are not based on a survey, rather the estimates are measured using the Thurston County parcel GIS layer.

With respect to category III and IV wetlands, surface level stormwater management facilities may be allowed in the outer twenty-five percent of the wetland buffer using best management practices; provided the community development director makes all of the following determinations:

a. No other location is feasible.

b. The location of such facilities will not degrade the functions or values of the wetland.

Under TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction*, the buffer widths recommended for land uses with high-intensity impacts to wetlands can be reduced to those widths recommended for moderate-intensity impacts under the following conditions:

1. For wetlands that score moderate or high for habitat (five [5] points or more), the width of the buffer around the wetland can be reduced if both the following criteria are met:

    a. A relatively undisturbed vegetated corridor at least one hundred feet wide is protected between the wetland and any other priority habitats as defined by the Washington State Department of Fish and Wildlife. The corridor must be protected for the entire distance between the wetland and the priority habitat via some type of legal protection such as a conservation easement; and

    b. Measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5), are applied.

The proposed project would reduce buffers in compliance with TMC Chapter 16.28.170---*Wetland buffers*, Subsection (C)---*Buffer Width Reduction* by:

1) Reducing the high land use intensity buffer to the moderate land use intensity,

2) Protect a relatively undisturbed vegetated corridor at least one hundred (≥100) feet wide, and by

3) Applying measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 16.28.170(5).

Under TMC 16.28.170(E)---*Standard Wetland Buffer Width Averaging*, standard wetland buffer zones may be modified by averaging buffer widths if it will improve the protection of wetland functions, or if it is the only way to allow for reasonable use of a parcel. Averaging cannot be used in conjunction with the provisions for reductions in buffer widths. Wetland buffer width averaging shall be allowed to improve wetland protection only where a qualified wetlands professional demonstrates all of the following:

1. The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a "dual-rated" wetland with a category I area adjacent to a lower rated area;

2. The buffer is increased adjacent to the higher functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower functioning or less sensitive portion;

3. The total area contained in the buffer area after averaging is not less than that which would be contained within the standard buffer; and

4. The buffer at its narrowest point is never less than three-fourths of the required width.

10.0 REFERENCES

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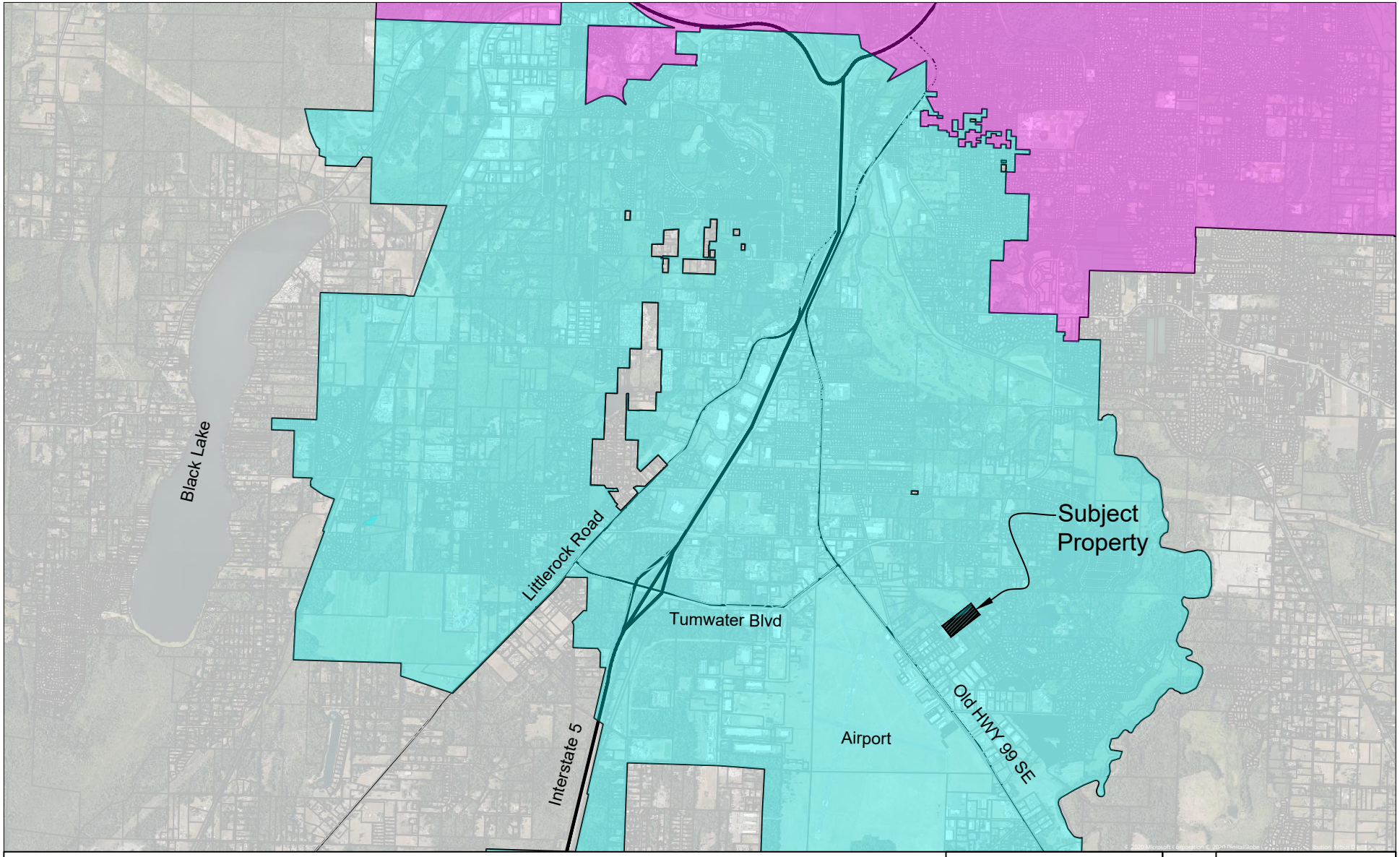
FIGURES



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City of Tumwater

City of Olympia

Figure 1

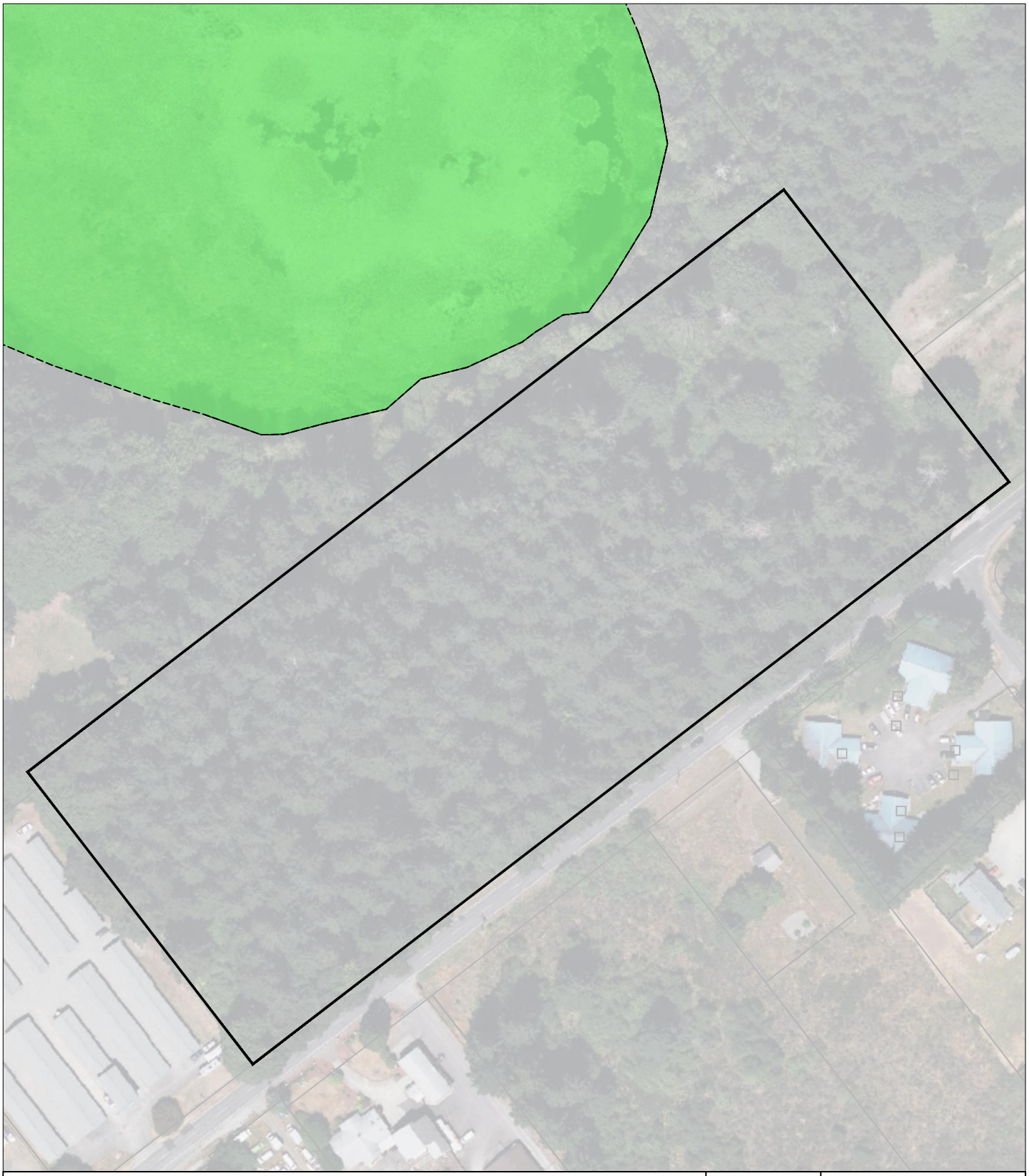
Henderson

Vicinity Map

Scale: 1" = 4000'

0 4000'

26 June 2023



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Wetland (Confirmed)

Wetland (Agency Mapped & LiDAR)

Streams

Figure 2

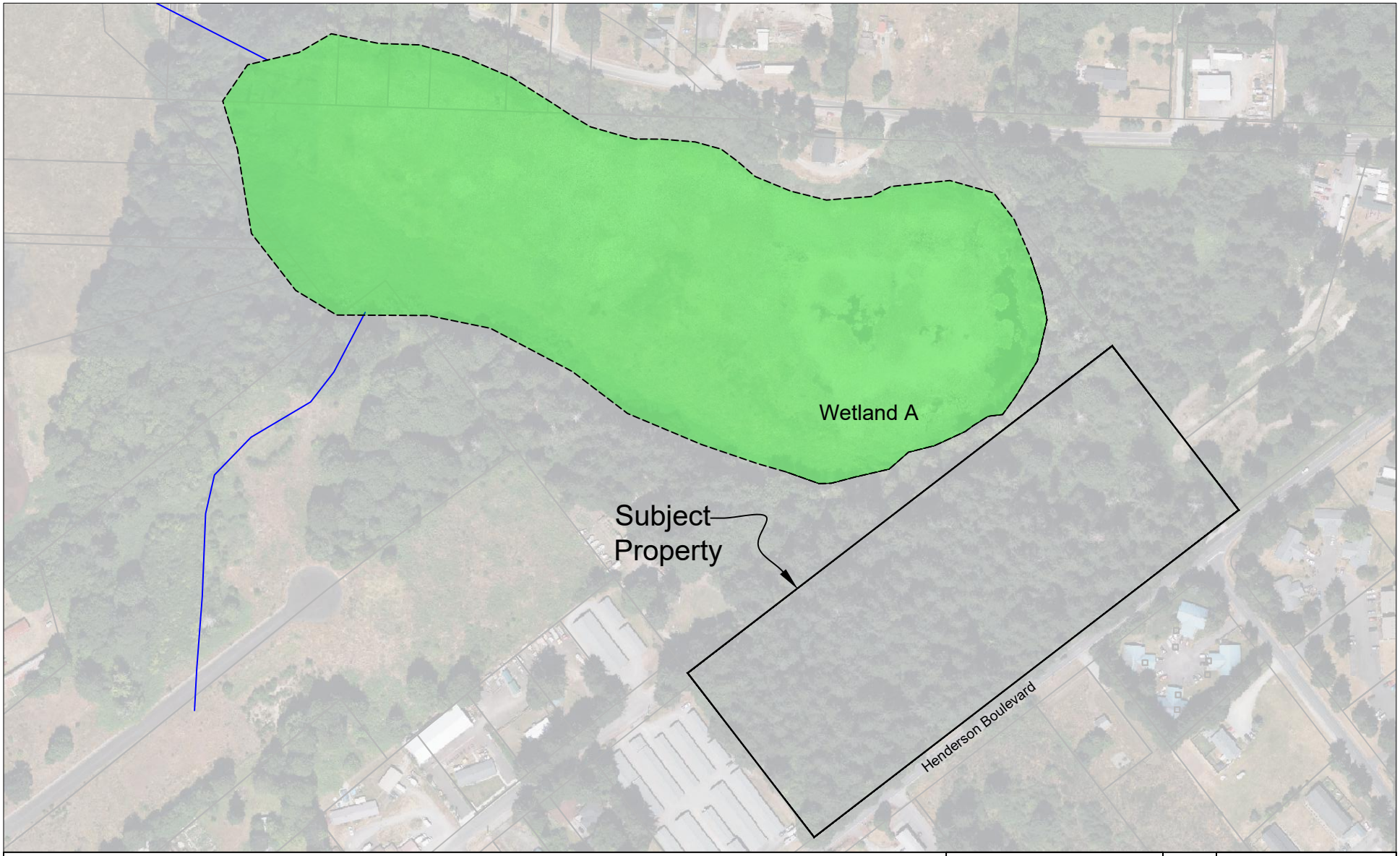
Henderson

Existing Conditions

Scale: 1"= 150'

0 150'

26 June 2023



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Wetland (Confirmed)

Wetland (Agency Mapped & LiDAR)

Figure 3

Henderson

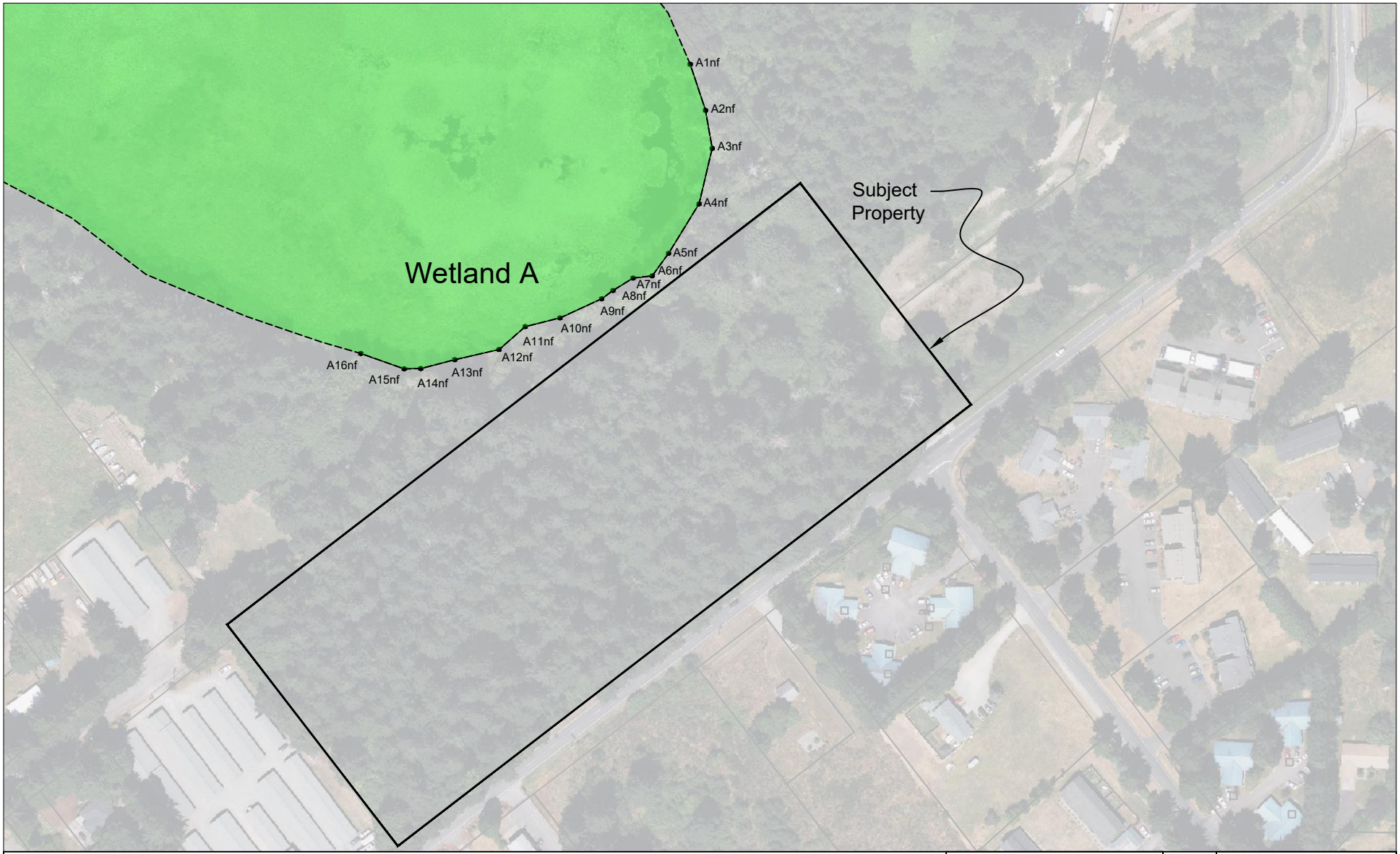
Existing Conditions
Wetland A

N

Scale: 1" = 270'

0 270'

26 June 2023



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Wetland (Confirmed)

Wetland (Agency Mapped & LiDAR)

A-1 — A-2 Wetland Delineation

▲TP A-2 Test Plot

nf: no flag at this location

Figure 4

Henderson

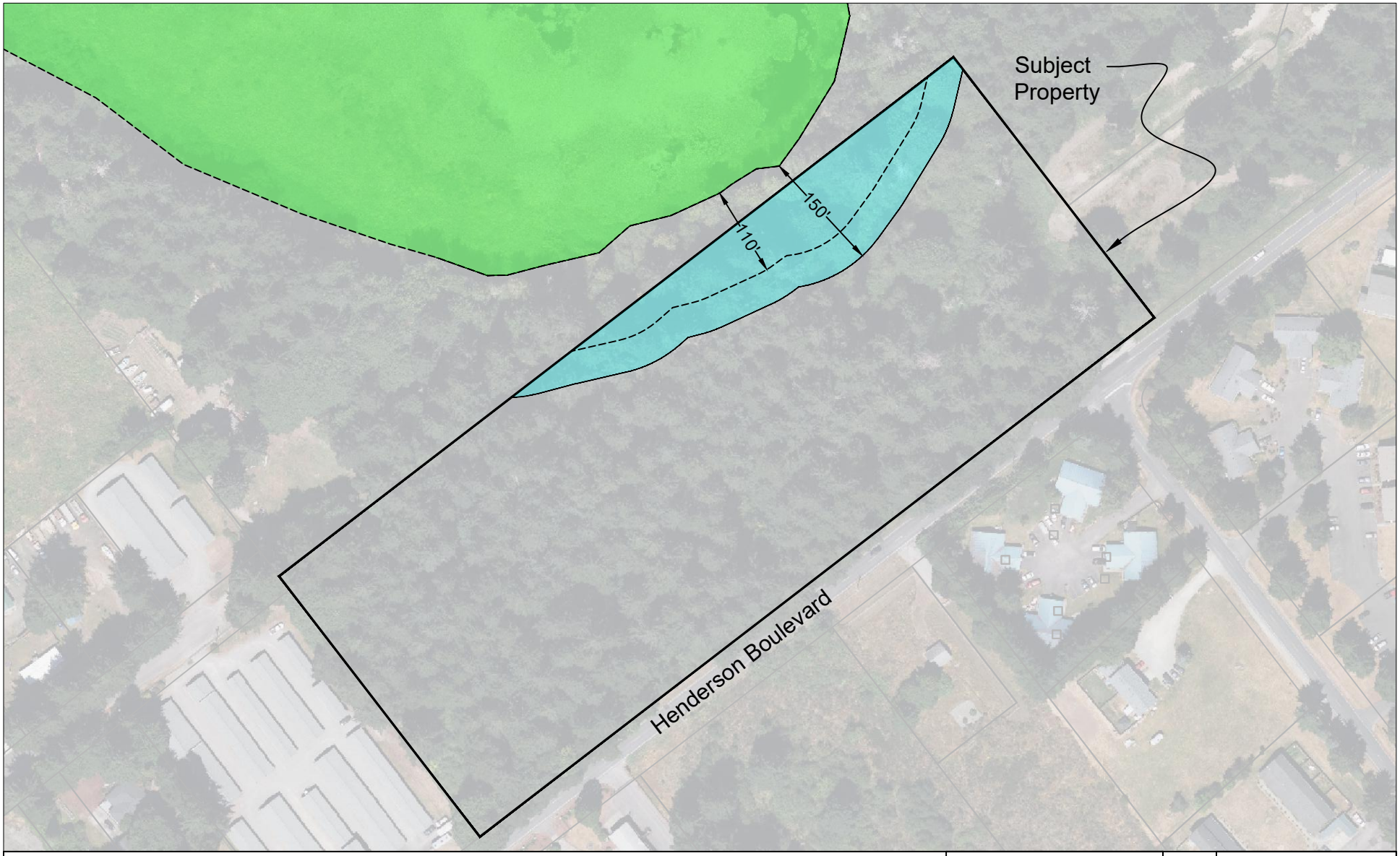
Wetland Delineation

N

Scale: 1" = 200'

0 200'

26 June 2023



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Wetland (Confirmed)

Wetland (Estimated from Agency Databases)

Standard Wetland Buffer (150 feet)

Reduced Buffer with Mitigation (110 feet)

Figure 5

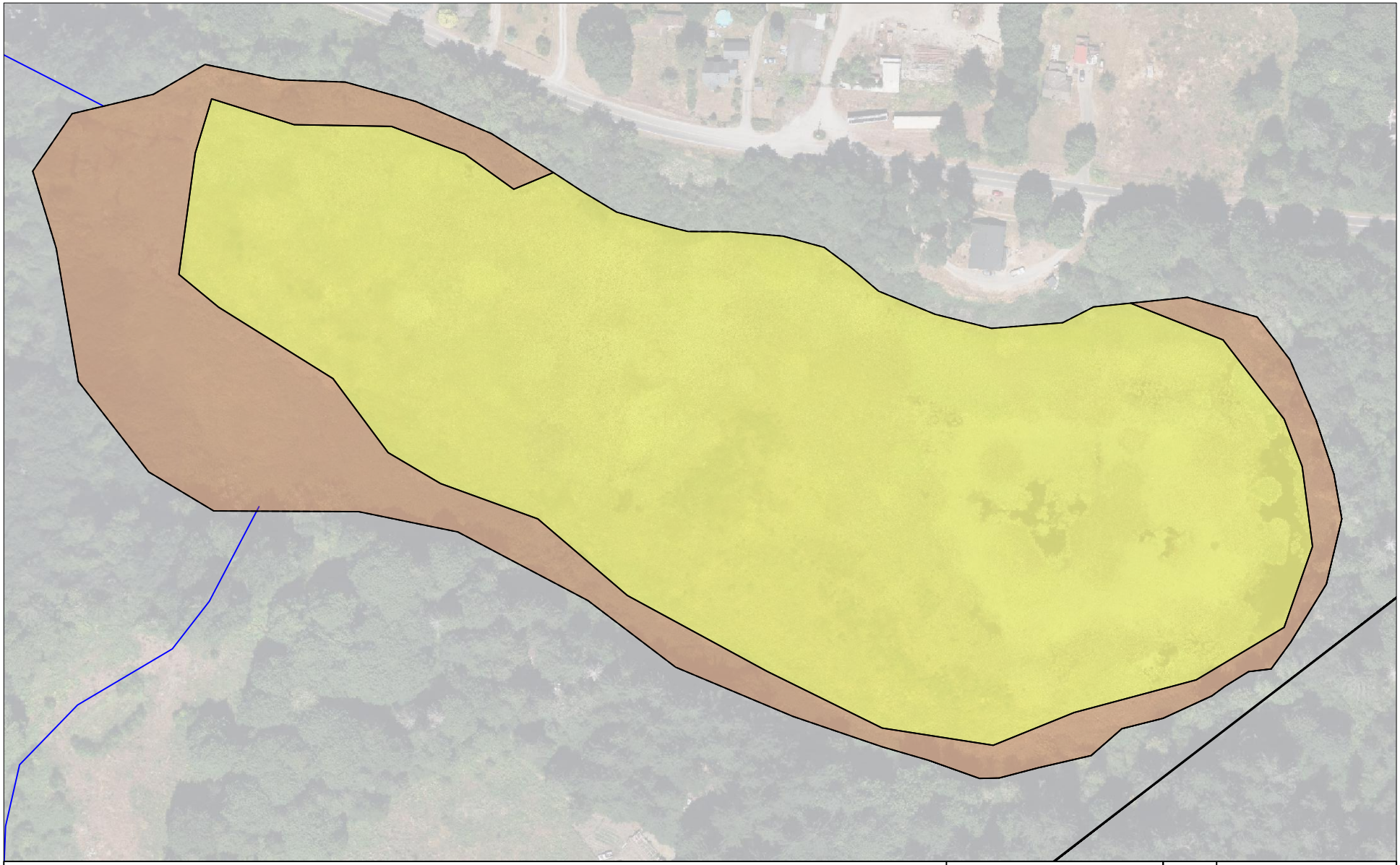
Henderson

Wetland Buffers

Scale: 1" = 170'

0 170'

26 June 2023



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Aquatic bed Permenantly-flooded

Scrub-shrub Seasonally-flooded

Figure 6

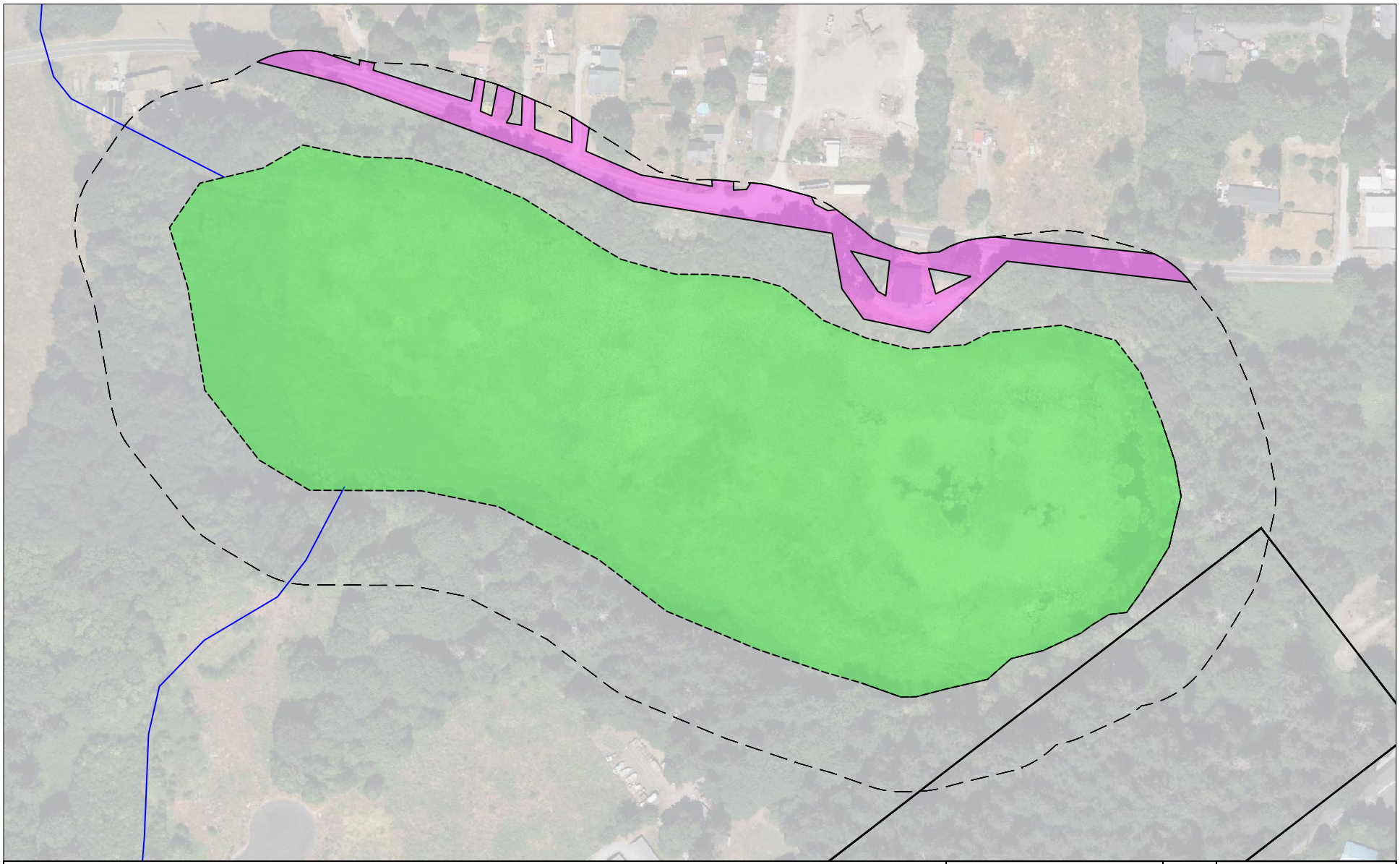
Henderson

Vegetation Classes & Hydroperiods

Scale: 1" = 100'

0 100'

26 June 2023



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Potential Pollutants 12%
Stream
150-foot polygon

Figure 7

Henderson

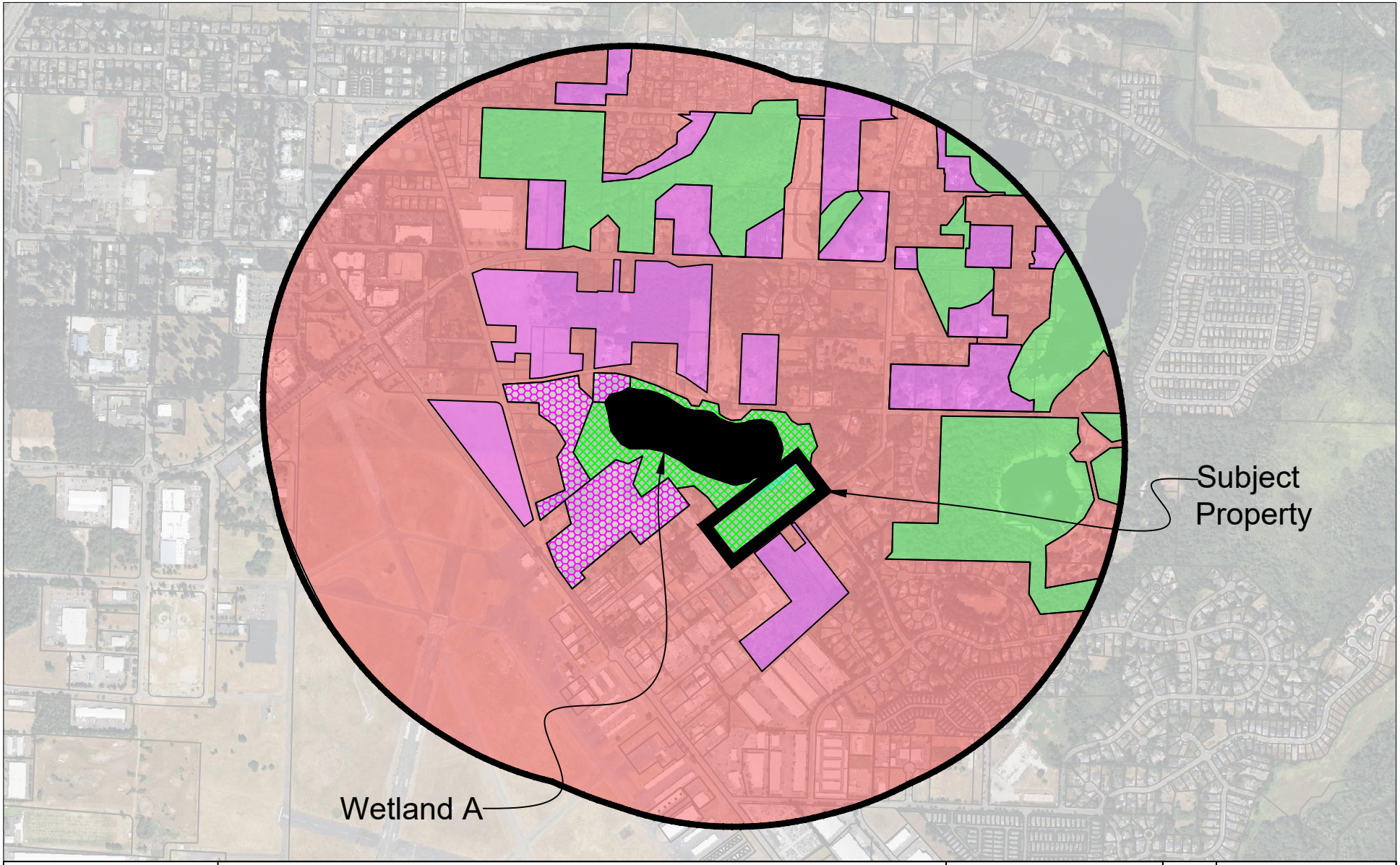
Potential Pollutants

N

Scale: 1" = 100'

0 100'

26 June 2023



EnviroVector
OPTIMIZE USABLE LAND
curtis@envirovector.com
www.envirovector.com
360-790-1559

Accessible Habitat (1,078,815 sf, 24.8 acres, 2.5%)

Accessible Moderate to Low Intensity Land Use (1,043,172 sf, 24 acres, 2%)

Total Undisturbed Habitat + Accessible Habitat (6,560,541 sf, 150.6 acres, 15%)

Low to Moderate Intensity Land Use (6,424,199 sf, 147.5 acres, 15%)

High Intensity Land Use (27,992,387 sf, 665.6 acres, 66.2%)

1km Polygon 43,794,349 sf (1,005 acres)

H2.1: 2.5% + 2%/2 = 3.5% (0 points) H2.2: 15% + 15%/2 = 22.5% (1 point) H2.3: High Intensity = 66.2% (-2 points)

Figure 8

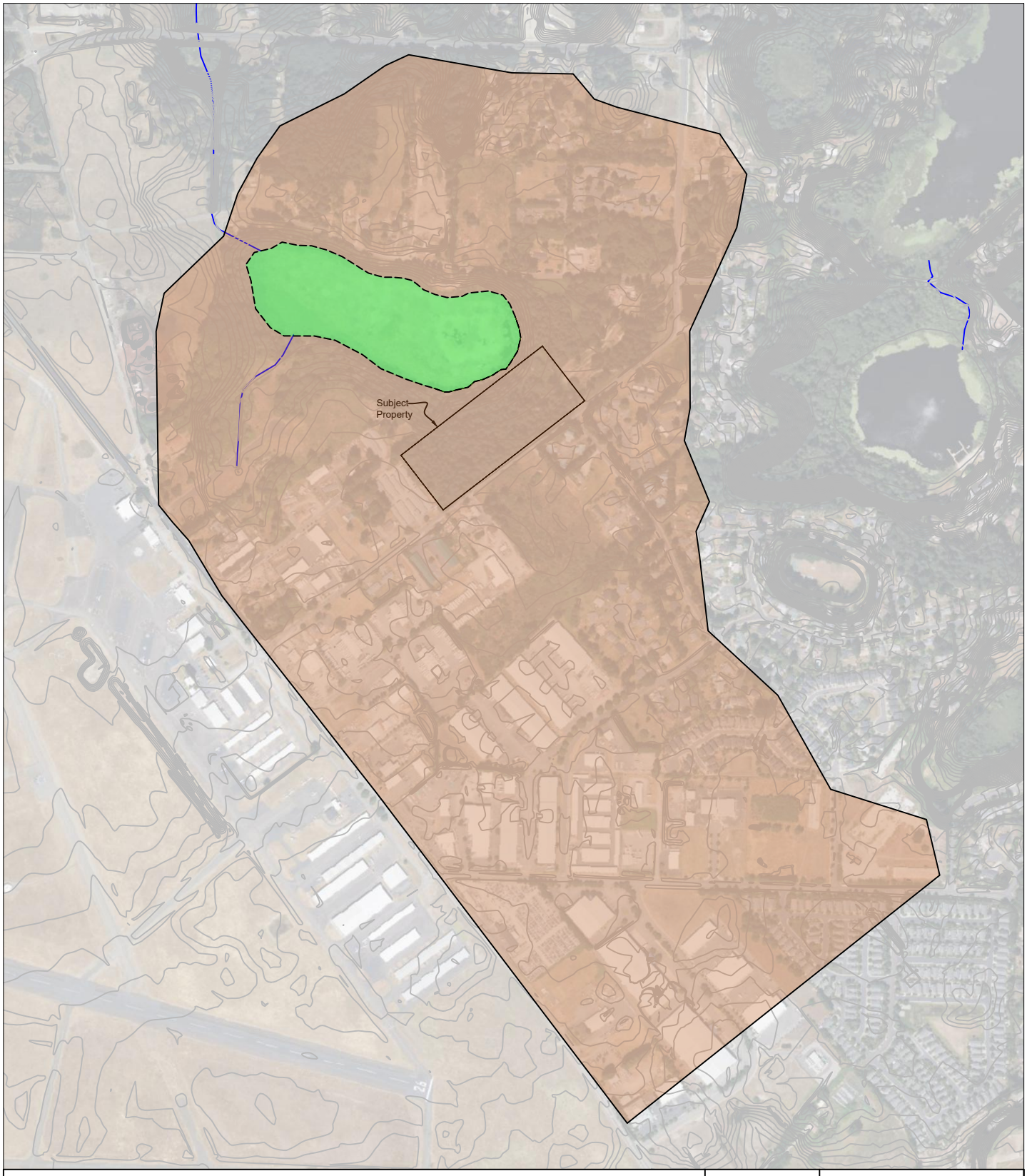
Henderson

1 km Polygon
Wetland E

Scale: 1" = 1250'

0 1250'

26 June 2023



EnviroVector
OPTIMIZE USABLE LAND

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www.envirovector.com
360-790-1559

Wetland A (Confirmed)

Wetland (Mapped from LiDAR)

Wetland A (18x)

Figure 9

Henderson

Contributing Basin

Scale: 1" = 800'

0 800'

26 June 2023

APPENDIX A

PHOTOGRAPHS


Photo 1. Vegetated wetland buffer area onsite


Photo 2. Vegetated wetland buffer area onsite


Photo 3. Property line or corner


Photo 4. Property line or corner


Photo 5. Wetland A, Aquatic bed interior, scrub shrub periphery


Photo 6. Scrub shrub periphery of wetland


Photo 7. Scrub shrub periphery of wetland


Photo 8. Scrub shrub periphery of wetland

Photo 9. Wetland A, Aquatic bed interior, scrub shrub periphery

Photo 10. Wetland A, Aquatic bed interior, scrub shrub periphery

Photo 11. TP-A1 in Wetland A

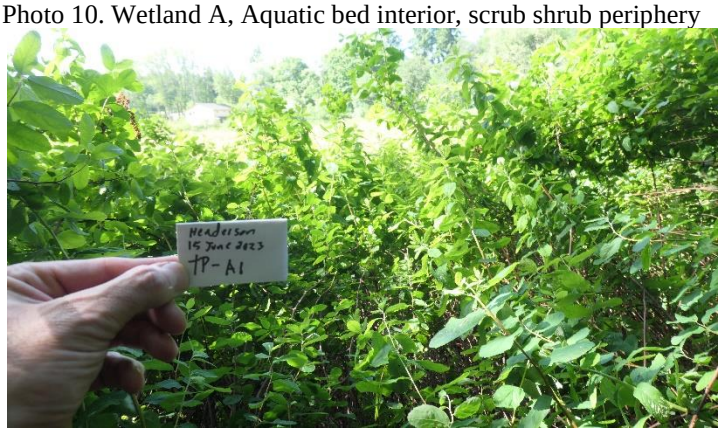


Photo 12. Vegetation at TP-A1

Photo 13. TP-A2 in wetland buffer

Photo 14. TP-A2 in wetland buffer

Photo 15. Vegetation at TP-A2

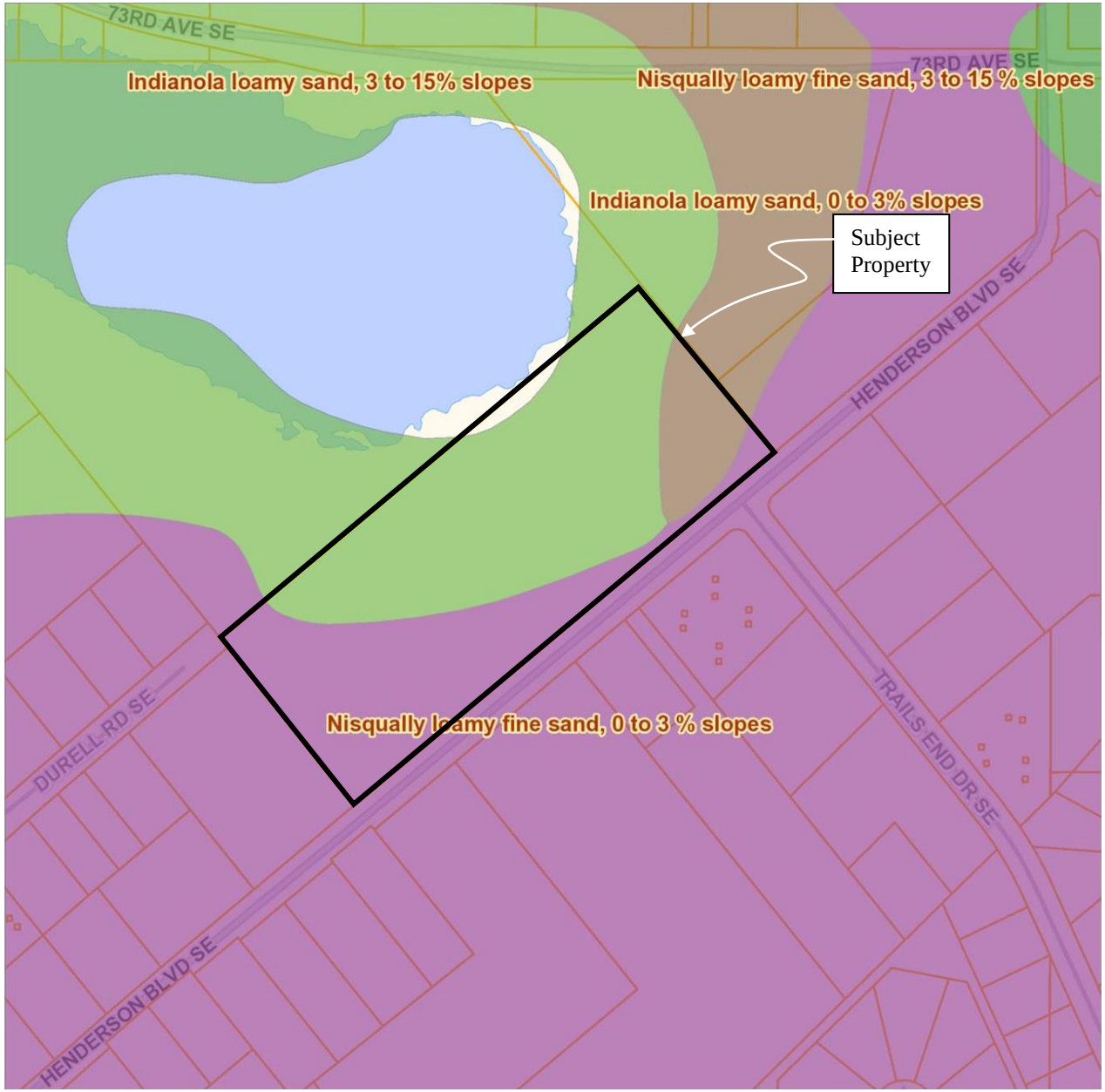
Photo 16. Vegetation at TP-A2

Appendix B

Thurston County

Geodata Center

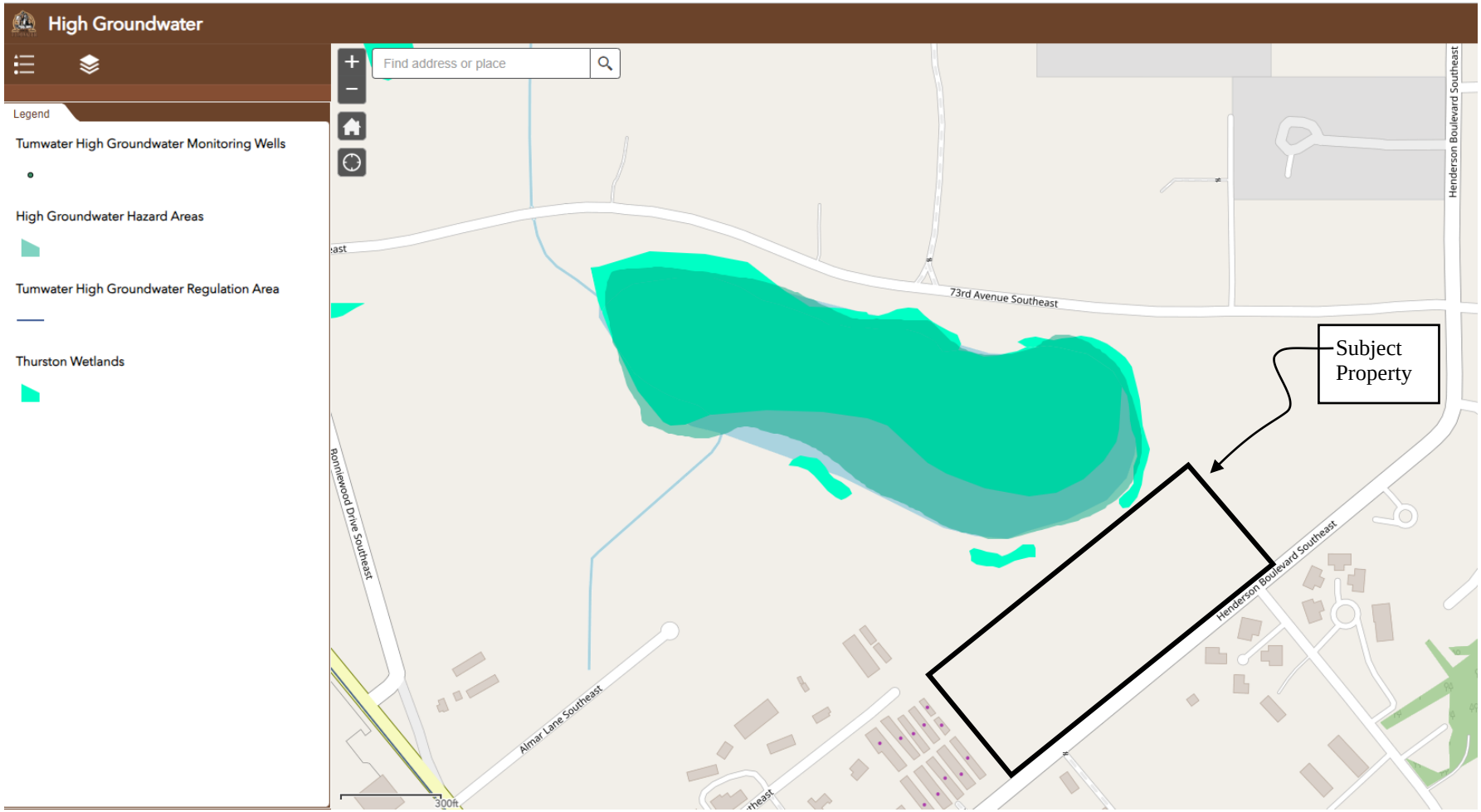
Soils Survey


73RD AVE SE
Indianola loamy sand, 3 to 15% slopes
73RD AVE SE
Nisqually loamy fine sand, 3 to 15 % slopes
Indianola loamy sand, 0 to 3% slopes
Subject Property
HENDERSON BLVD SE
DURELL RD SE
Nisqually loamy fine sand, 0 to 3 % slopes
TRAILS END DR SE
HENDERSON BLVD SE

Appendix C

City of Tumwater

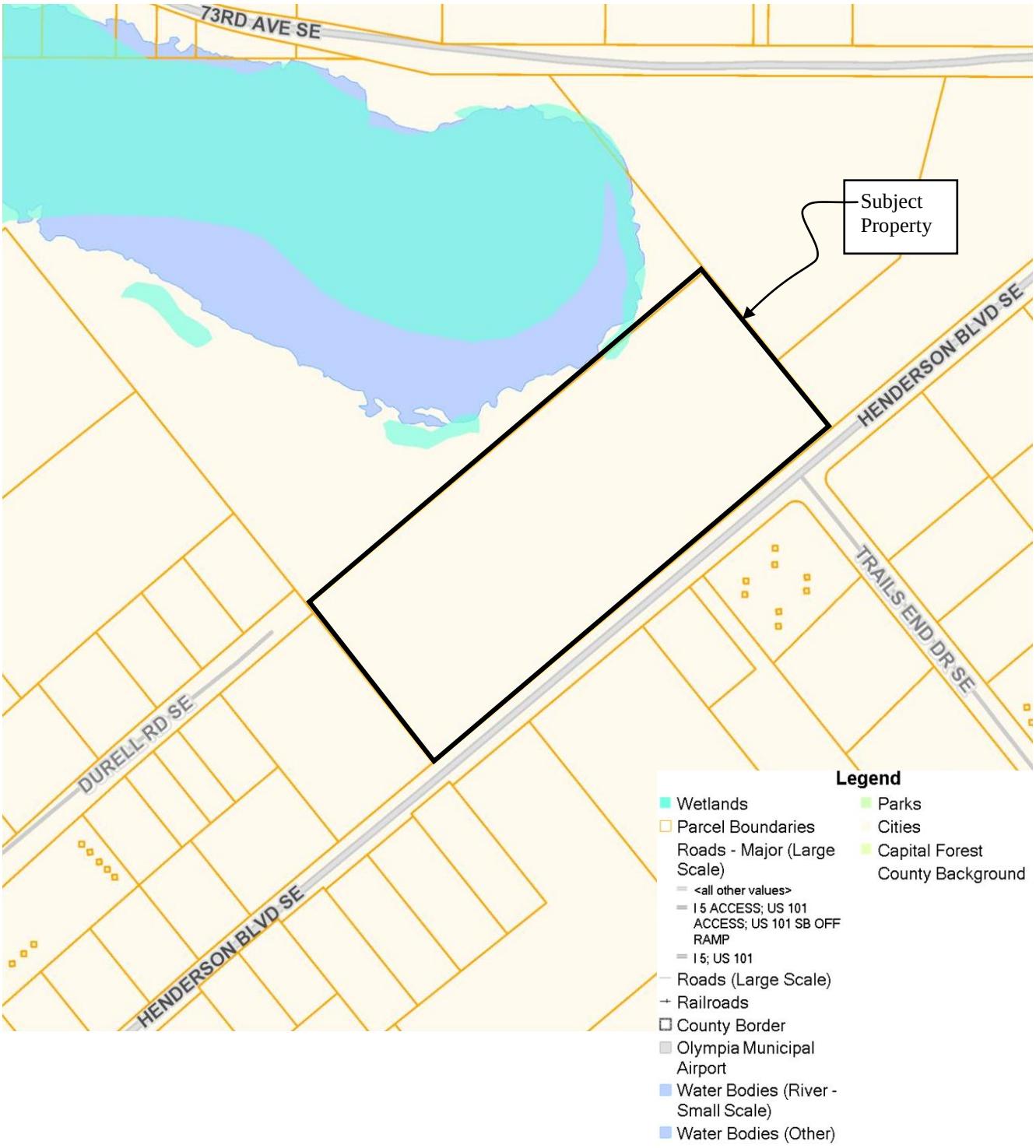
Wetlands and Streams


High Groundwater
Legend
Tumwater High Groundwater Monitoring Wells
High Groundwater Hazard Areas
Tumwater High Groundwater Regulation Area
Thurston Wetlands
Find address or place
73rd Avenue Southeast
Henderson Boulevard Southeast
Bonniewood Drive Southeast
Almar Lane Southeast
Subject Property
300ft

Appendix D

Thurston County

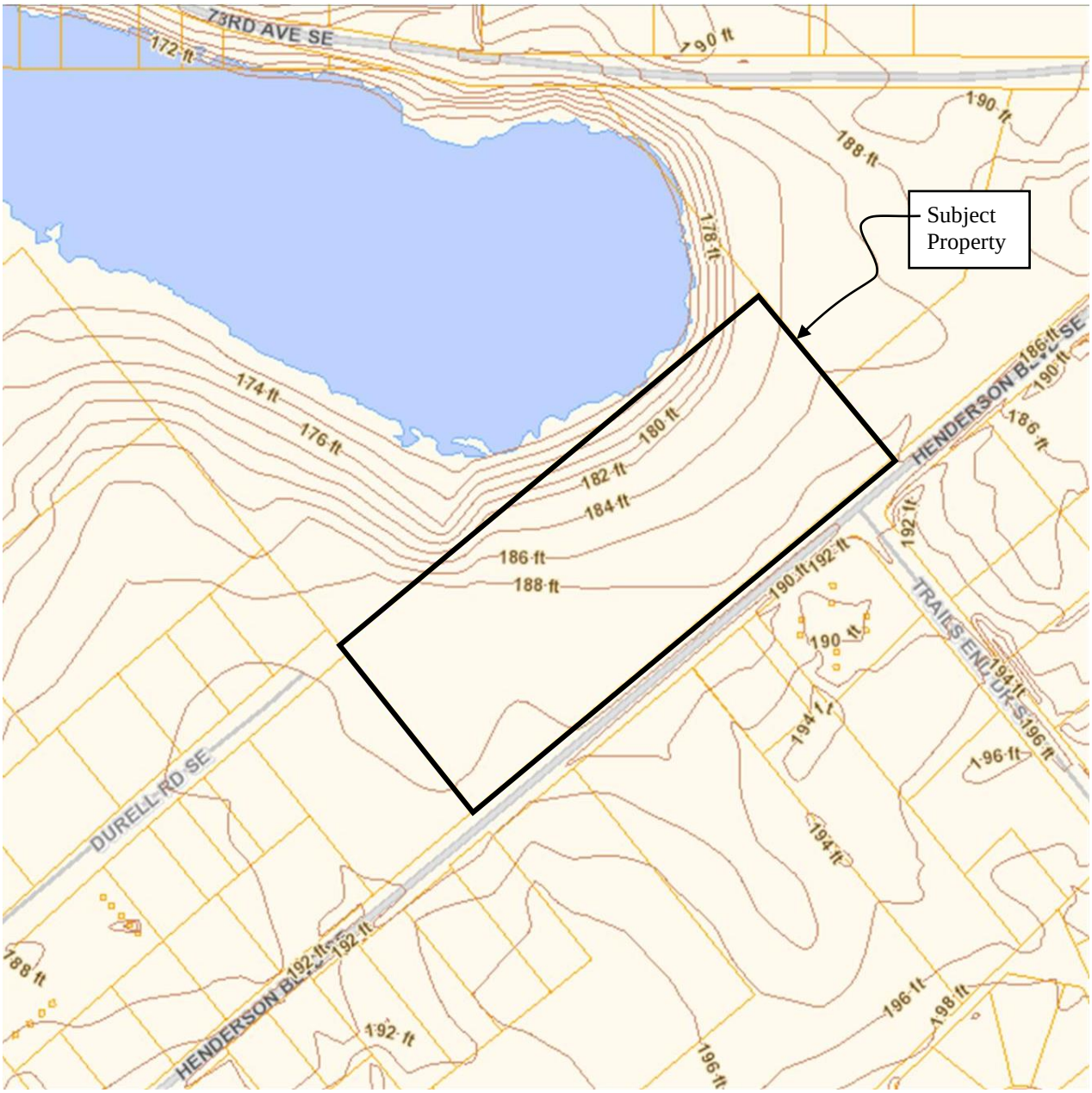
Geodata Center Database


73RD AVE SE
Subject Property
HENDERSON BLVD SE
TRAILS END DR SE
DURELL RD SE
HENDERSON BLVD SE
Legend
Wetlands
Parcel Boundaries
Roads - Major (Large Scale)
<all other values>
I 5 ACCESS; US 101 ACCESS; US 101 SB OFF RAMP
I 5; US 101
Roads (Large Scale)
Railroads
County Border
Olympia Municipal Airport
Water Bodies (River - Small Scale)
Water Bodies (Other)
Parks
Cities
Capital Forest
County Background

Appendix E

Thurston County

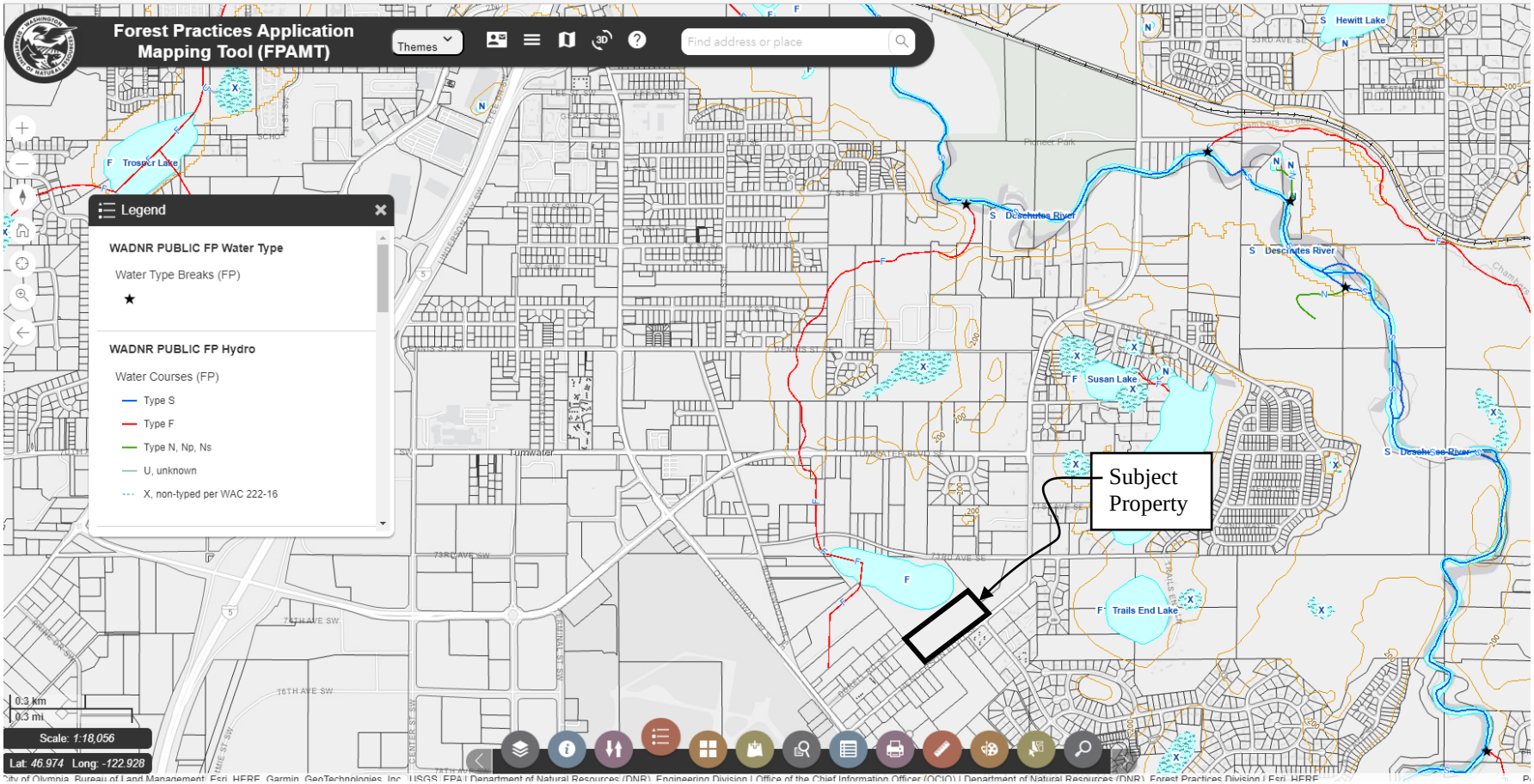
Contours


73RD AVE SE
172 ft
190 ft
188 ft
178 ft
Subject Property
174 ft
176 ft
180 ft
182 ft
184 ft
186 ft
188 ft
HENDERSON BLVD SE
186 ft
190 ft
186 ft
192 ft
190 ft
192 ft
TRAILS END LOOP S
190 ft
194 ft
194 ft
196 ft
194 ft
DURELL RD SE
188 ft
192 ft
192 ft
192 ft
196 ft
198 ft
196 ft

Appendix F

State Department of Natural Resources (DNR)

Water Typing Database

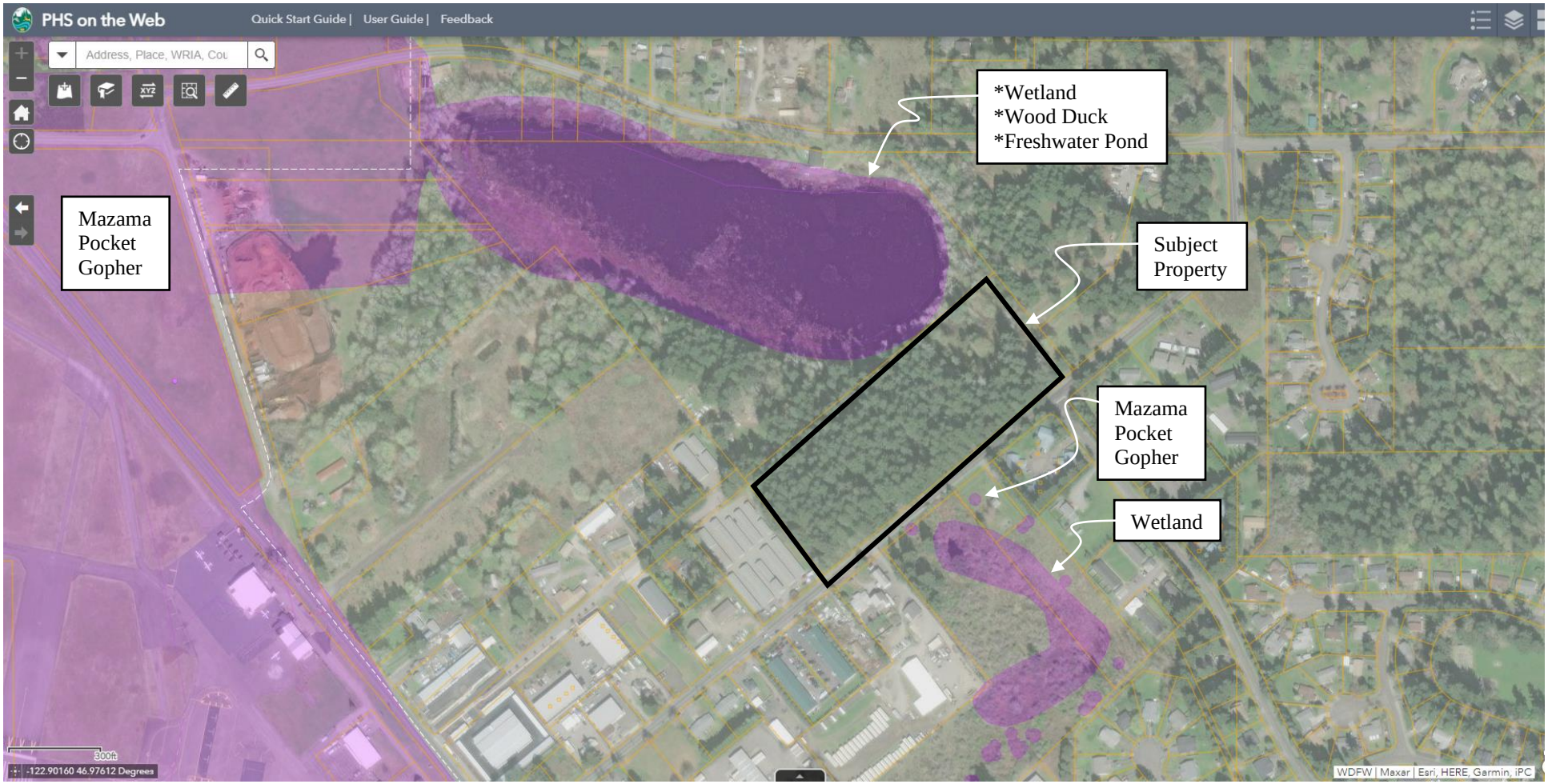

Forest Practices Application Mapping Tool (FPAMT)
Themes
Find address or place
Legend
WADNR PUBLIC FP Water Type
Water Type Breaks (FP)
WADNR PUBLIC FP Hydro
Water Courses (FP)
Type S
Type F
Type N, Np, Ns
U, unknown
X, non-typed per WAC 222-16
Subject Property
Hewitt Lake
Deschutes River
Susan Lake
Trails End Lake
Tumwater
0.3 km
0.3 mi
Scale: 1:18,056
Lat: 46.974 Long: -122.928

Appendix G

Washington Department of Fish and Wildlife (WDFW)

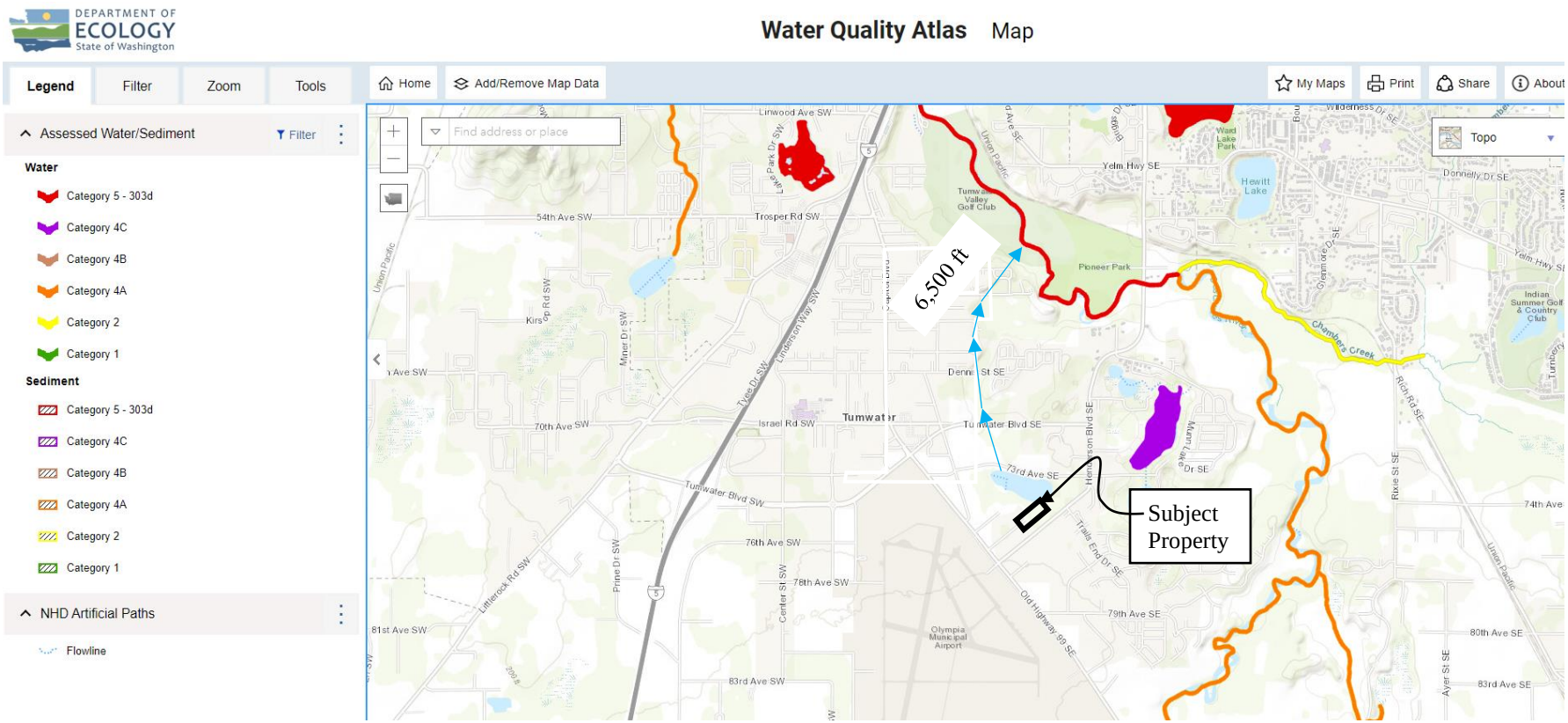
Priority Habitats and Species (PHS)

Database


PHS on the Web
Quick Start Guide | User Guide | Feedback
Address, Place, WRIA, Cou
*Wetland
*Wood Duck
*Freshwater Pond
Mazama Pocket Gopher
Subject Property
Mazama Pocket Gopher
Wetland
300ft
-122.90160 46.97612 Degrees
WDFW | Maxar | Esri, HERE, Garmin, iPC

Appendix H

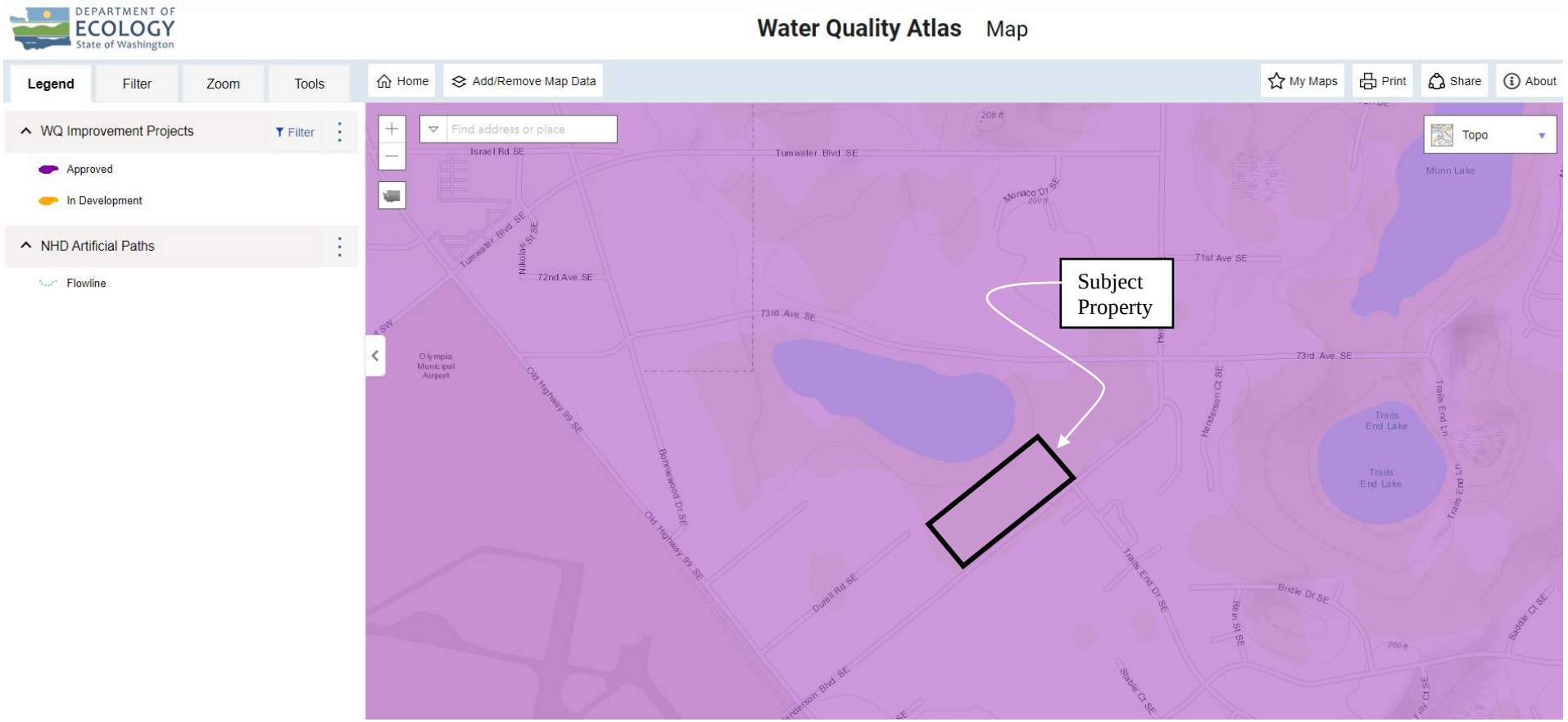
303(d)


DEPARTMENT OF ECOLOGY
State of Washington
Water Quality Atlas Map
Legend
Filter
Zoom
Tools
Home
Add/Remove Map Data
My Maps
Print
Share
About
Assessed Water/Sediment
Filter
Water
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
Sediment
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
NHD Artificial Paths
Flowline
Find address or place
Topo
6,500 ft
Subject Property
Tumwater
Linwood Ave SW
Trosper Rd SW
54th Ave SW
Israel Rd SW
70th Ave SW
Tumwater Blvd SW
76th Ave SW
78th Ave SW
79th Ave SE
81st Ave SW
83rd Ave SW
Yelm Hwy SE
Pioneer Park
Chambers Creek
Tumwater Blvd SE
73rd Ave SE
Old Highway 99 SE
Olympia Municipal Airport

Appendix I

Department of Ecology Water Quality Atlas Database

TMDL

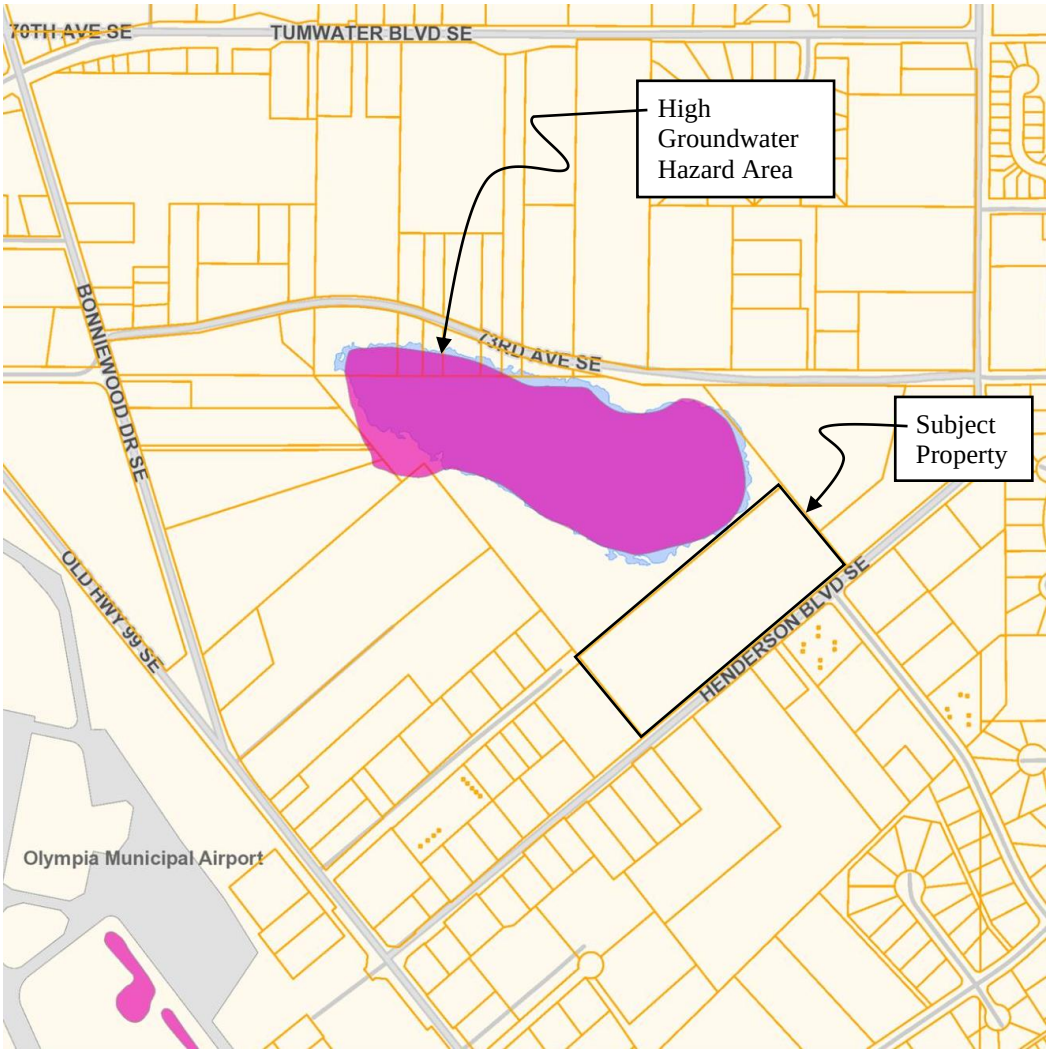

DEPARTMENT OF ECOLOGY State of Washington
Water Quality Atlas Map
Legend
Filter
Zoom
Tools
Home
Add/Remove Map Data
My Maps
Print
Share
About
WQ Improvement Projects
Filter
Approved
In Development
NHD Artificial Paths
Flowline
Find address or place
Topo
Subject Property
Israel Rd SE
Tumwater Blvd SE
Monaco Dr SE
Munn Lake
Tumwater Blvd SE
Nikolas St SE
72nd Ave SE
71st Ave SE
73rd Ave SE
Olympia Municipal Airport
Old Highway 99 SE
Bonniewood Dr SE
Henderson Ct SE
Trails End Lake
Trails End Ln
Durell Rd SE
Trails End Dr SE
Bridle Dr SE
Rein St SE
Saddle Ct SE
Stable Ct SE

Appendix J

Thurston County

Geodata Center

High Water Hazard Area


70TH AVE SE
TUMWATER BLVD SE
High Groundwater Hazard Area
BONNIEWOOD DR SE
73RD AVE SE
Subject Property
OLD HWY 99 SE
HENDERSON BLVD SE
Olympia Municipal Airport

Appendix K

Rating Forms

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 15-Jun-23

Rated by Curtis Wambach Trained by Ecology? ☑ Yes ☐ No Date of training Continual

HGM Class used for rating Depressional & Flats Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map GoogleEarth, AutoDesk, Thurston Geodata

OVERALL WETLAND CATEGORY III (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____ **Category I** - Total score = 23 - 27
_____ **Category II** - Total score = 20 - 22
X **Category III** - Total score = 16 - 19
_____ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	M	M	M	
Landscape Potential	M	M	L	
Value	H	M	H	**Total**
Score Based on Ratings	7	6	6	**19**

Score for each function based on three ratings (*order of ratings is not important*)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	Category
Estuarine	
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	

None of the above	**X**

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	6
Hydroperiods	D 1.4, H 1.2	6
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	6
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	7
Map of the contributing basin	D 4.3, D 5.3	9
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	8
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	Appendix I
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	Appendix H

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	

polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetland in Western Washington

For questions 1 -7, the criteria described must apply to the entire unit being rated.
If hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1 - 7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☑ NO - go to 2 ☐ **YES** - the wetland class is **Tidal Fringe** - go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☑ **NO - Saltwater Tidal Fringe (Estuarine)** ☐ **YES - Freshwater Tidal Fringe**
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

☑ NO - go to 3 ☐ **YES** - The wetland class is **Flats**
*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☑ NO - go to 4 ☐ **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
☐ The wetland is on a slope (*slope can be very gradual*),
☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
☐ The water leaves the wetland **without being impounded.**

☑ NO - go to 5 ☐ **YES** - The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
☐ The overbank flooding occurs at least once every 2 years.

☑ NO - go to 6 ☐ **YES** - The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding.

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the*

☐ NO - go to 7 ☑ **YES** - The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☑ NO - go to 8 ☐ **YES** - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

NOTES and FIELD OBSERVATIONS:

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☑ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*). Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	**8**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: ☐ **3 or 4 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	2
Total for D 3 Add the points in the boxes above	**3**

Rating of Value If score is: ☑ **2 - 4 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?		
D 4.1. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	0
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*		3
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
☐ The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*		3
☐ The area of the basin is less than 10 times the area of the unit	points = 5	
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
☐ Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	**6**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic function of the site?		
D 5.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	**1**

Rating of Landscape Potential If score is: ☐ **3 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*		1
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon		
● Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2	
☐ ● Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
☑ Flooding from groundwater is an issue in the sub-basin.	points = 1	
☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why	points = 0	

☐ There are no problems with flooding downstream of the wetland.	points = 0	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	0
Total for D 6	Add the points in the boxes above	**1**

Rating of Value If score is: ☑ **2 - 4 = H** ☑ **1 = M** ☐ **0 = L** *Record the rating on the first page*

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

☑ Aquatic bed	4 structures or more: points = 4	1
☐ Emergent	3 structures: points = 2	
☑ Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points - 1	
☐ Forested (areas where trees have > 30% cover)	1 structure: points = 0	

If the unit has a Forested class, check if:

☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

☑ Permanently flooded or inundated	4 or more types present: points = 3	1
☑ Seasonally flooded or inundated	3 types present: points = 2	
☐ Occasionally flooded or inundated	2 types present: points = 1	
☐ Saturated only	1 types present: points = 0	
☐ Permanently flowing stream or river in, or adjacent to, the wetland		
☐ Seasonally flowing stream in, or adjacent to, the wetland		
☐ **Lake Fringe wetland**	**2 points**	
☐ **Freshwater tidal wetland**	**2 points**	

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

2

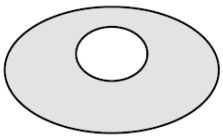
If you counted:	> 19 species	points = 2
	5 - 19 species	points = 1
	< 5 species	points = 0

H 1.4. Interspersion of habitats

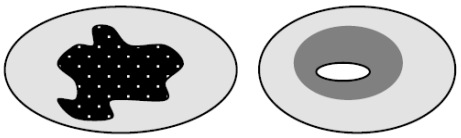
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*

1

None = 0 points

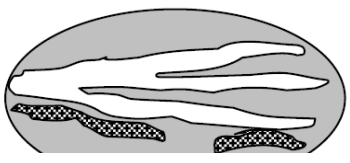


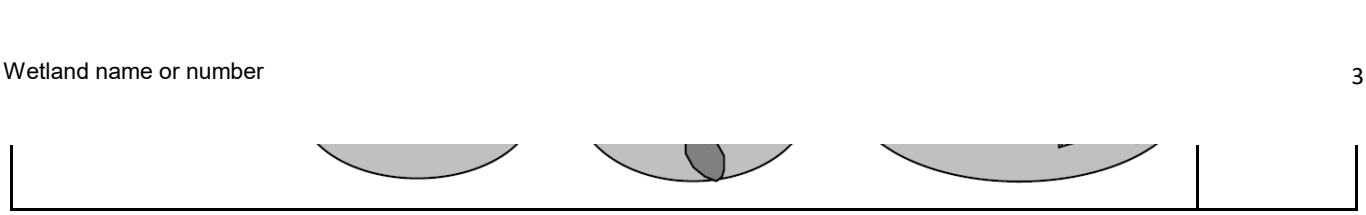
Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3 points





H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☑ Standing snags (dbh > 4 in) within the wetland ☑ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☑ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by* ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	4
Total for H 1 Add the points in the boxes above	**9**

Rating of Site Potential If Score is: ☐ **15 - 18 = H** ☑ **7 - 14 = M** ☐ **0 - 6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 2.5 % undisturbed habitat + (2 % moderate & low intensity land uses / 2) = 3.5% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 15 % undisturbed habitat + (15 % moderate & low intensity land uses / 2) = 22.5% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3 Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	**-1**

Rating of Landscape Potential If Score is: ☐ **4 - 6 = H** ☐ **1 - 3 = M** ☑ **< 1 = L***Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated*. Site meets ANY of the following criteria: points = 2 ☐ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☑ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a	2

watershed plan		
Site has 1 or 2 priority habitats (listed on next page) with in 100m	points = 1	
Site does not meet any of the criteria above	points = 0	

Rating of Value If Score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE**: This question is independent of the land use between the wetland unit and the priority habitat.*

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are >

12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	Category
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☑ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☑ Yes - Go to **SC 2.2** ☑ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☑ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☑ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☑ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir,	

western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☐ No = **Is not a bog**	

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

☐ Yes = **Category I** ☑ No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

☐ Yes - Go to **SC 5.1** ☑ No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ Yes = **Category I** ☐ No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes - Go to **SC 6.1** ☑ No = **Not an interdunal wetland for rating**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

☐ Yes = **Category I** ☐ No - Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

☐ Yes = **Category III** ☐ No = **Category IV**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form

Appendix L

Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Henderson Property City/County: Thurston County Sampling Date: 15 June 2023

Applicant/Owner: Henderson Property State: WA Sampling Point: TP-A1

Investigator(s): Curtis Wambach Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 12)			
1. Douglas spirea (Spiraea douglasii)	100	Y	FACW
2. Pacific crabapple (Malus fusca)	20	Y	FACW
3.			
4.			
5.			
	120	= Total Cover	
Herb Stratum (Plot size: 6)			
1. Reed canarygrass (Phalaris arundinacea)	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 185 (A)	370 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

- ☒ Rapid Test for Hydrophytic Vegetation
- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

SOIL

Sampling Point: TP-A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/1							Sandy Muck

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): Surface

Water Table Present? Yes ☒ No ☐ Depth (inches): Surface

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Henderson City/County: Thurston County Sampling Date: 15 June 2023

Applicant/Owner: Henderson State: WA Sampling Point: TP-A2

Investigator(s): Curtis Wambach Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Douglas fir (Pseudotsuga menziesii)	30	Y	FACU
2. Oregon ash (Fraximus latafolia)	20	Y	FACW
3. Big leaf maple (Acer macrophyllum)	20	Y	FACU
4.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 12)			
1. Snowberry (Physocarpus albus)	60	Y	FACU
2. Osoberry (Oemleria cerasiformis)	30	Y	FACU
3. Serviceberry (Amelanchier alnifolia)	30	Y	FACU
4. Vine maple (Acer circinatum)	10	N	FAC
5. Himalayan blackberry (Rubus armeniacus)	5	N	FAC
	135	= Total Cover	
Herb Stratum (Plot size: 6)			
1. Swordfern (Polystichum munitum)	60	Y	FACU
2. Trailing blackberry (Rubus ursinus)	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 20	x 2 = 40
FAC species 15	x 3 = 45
FACU species 260	x 4 = 1040
UPL species _____	x 5 = _____
Column Totals: 295 (A)	1125 (B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: TP-A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/2							Sandy silt

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: