

April 5, 2024

AOA-6739

Sam Salo, PE ssalo@encompasses.net

SUBJECT: Wetland and Stream Study for American Pride Lending Property 212 Todd Road NE, Parcel 042022-2008, Puyallup, WA (P-21-0146) City Permit Application # PRGR20230114 (Revised)

Dear Sam:

We have updated this study to address the comments presented in the April 6, 2023 letter from Confluence, third party peer review consultant for the City of Puyallup.

1.0 BACKGROUND

On March 1, 2022 I conducted an initial wetland and stream reconnaissance on and adjacent to the subject property utilizing the methodology outlined in the May 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).* An additional field investigation was conducted by AOA on June 23, 2022.

At the time of the field investigations the property was entirely graveled except for a small house in the northwest corner of the site. Topography is flat and no significant native plant communities or wetlands are located on the property.

Wapato Creek flows from north to south off-site to the southeast. Although access was very limited, a narrow Riverine wetland (Wetland A) was observed in places along the creek. However, no wetlands were observed adjacent to the creek in the area in closest proximity to the subject property. **Attachment A** contains a data sheet prepared for the off-site upland area immediately adjacent to the creek within closest proximity to the property.

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2.0 WAPATO CREEK AND WETLAND A

Wapato Creek is known to support salmonids and would therefore be considered a Type II stream by the City of Puyallup. Type II streams require a minimum standard buffer of 100 feet per PMC 21.06.1050(2)(b). There is also a required 10-foot structure setback from the edge of the buffer. Wetland A consists of a narrow Riverine Hydrogeomorphic (HGM) class wetland. Vegetation within Wetland A and the riparian corridor of Wapato Creek in the vicinity of the site consisted primarily of a forested plant community that included red alder (*Alnus rubra*), Pacific willow (*Salix lasiandra*), Himalayan blackberry (*Rubus armeniacus*), climbing nightshade (*Solanum dulcamara*), and English ivy (*Hedera helix*).

Wetland A meets the criteria for a Category II wetland with 6 Habitat Points per the current City of Puyallup rating system (**Attachment B**). Category II wetlands with 6 Habitat Points require a standard 150-foot buffer adjacent high intensity land uses per PMC 21.06.930(2)(c). However, since Wetland A is not located adjacent to the creek in proximity to the site, it appears the Wapato Creek buffer would be more restrictive.

As requested by Confluence, we have prepared a vicinity map (**Figure 1**) and figure (**Figure 2**) showing critical areas within 300 feet of the site.

3.0 PROPOSED PROJECT

The proposed project consists of the construction of a 17 unit residential apartment development. As part of the project, the 100-foot buffer from Wapato Creek would be fully restored and protected in perpetuity.

3.1 Drainage Plan

Per the drainage plan prepared by Encompass (see civil plans for all stormwater information), it is my understanding that the project proposes stormwater detention via tanks within the recreation tract in the southern portion of the site. Runoff from the tanks would be discharged back to the stream buffer via a dispersion trench along the outside edge of the buffer to continue hydrologic support to off-site critical areas. It is also my understanding that discharges from the dispersion trench are intended to approximately replicate pre-development conditions.

3.2 Critical Area Impacts

The project has been designed to avoid all critical area impacts and the required 100-foot buffer from Wapato Creek will be preserved in perpetuity. Furthermore, all existing gravel within the buffer and structure setback will be removed and the entire buffer planted with a variety of native tree and shrub species. There are no known or anticipated impacts to the on-site buffer or off-site critical areas from the proposed project.

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4.0 BUFFER RESTORATION

The City of Puyallup requires that the minimum critical area buffer be vegetated with native species as part of any proposed project. Since the 100-foot Wapato Creek buffer extends into the subject property (**Drawing W1.0**) and the buffer area is currently gravel, a buffer restoration planting plan is required as part of a proposed site plan. Restoration will consist of gravel removal and re-planting with native trees and shrubs. A rail fence will then be installed along the buffer boundary.

4.1 Goal, Objectives, and Performance Standards for Restoration Area

The primary goal of the restoration plan is to increase the habitat function of the enhanced buffer. To meet this goal, the following objectives and performance standards have been incorporated into the design of the plan:

Objective A: Increase the structural and plant species diversity within the restoration area.

<u>Performance Standard:</u> Following every monitoring event for a period of at least five years, the planting area will contain at least 7 native plant species. There will be 100% survival of all woody planted species throughout the restoration area at the end of the first year of planting. For Years 2-5, success will be based on an 80% survival rate or similar number of recolonized native woody plants. Areal coverage of plantings or native re-colonized woody species will be at least 10% at Year 1, 20% at Year 2, 30% at Year 3, 40% at Year 4, and 50% at Year 5.

Objective B: Limit the amount of invasive and exotic species within the restoration area.

<u>Performance Standard:</u> After construction and following every monitoring event for a period of five years, exotic and invasive plant species will be maintained at levels below 10% total cover in the designated restoration area.

4.2 Construction Management

Prior to commencement of any work in the restoration area the limits will be staked. A pre-construction meeting should be held at the site to review and discuss all aspects of the project with the landscape contractor and/or owner.

A consultant will supervise plan implementation during construction to ensure that objectives and specifications of the restoration plan are met. Any necessary significant modifications to the design that occur because of unforeseen site conditions will be jointly approved by the City of Puyallup and the consultant prior to their implementation.

4.3 Monitoring Methodology

The monitoring program will be conducted for a period of five years, with annual reports submitted to the City. Vegetation monitoring will include general appearance, health, mortality, colonization rates, percent cover, percent survival, volunteer plant species, and invasive weeds.

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Photo-points will be established from which photographs will be taken throughout the monitoring period. These photographs will document general appearance and progress in plant community establishment in the restoration area. Review of the photos over time will provide a visual representation of the success of the plan.

4.4 Maintenance Plan

Maintenance will be conducted on a routine, year-round basis. Additional maintenance needs will be identified and addressed following periodic maintenance reviews. Routine removal and control of non-native and other invasive plants within the designated mitigation area shall be performed. Undesirable and weedy exotic plant species shall be maintained at levels below 10% total cover within the restoration area during the monitoring period.

Routine maintenance of planted trees and shrubs shall be performed. Measures include resetting plants to proper grades and upright positions. Tall grasses and other competitive weeds shall be weeded at the base of plants to prevent engulfment.

4.5 Contingency Plan

All dead plants will be replaced with the same species or an approved substitute species that meets the goal of the restoration plan. Plant material shall meet the same specifications as originally installed material. Replanting will not occur until after the reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.). Replanting shall be completed under the direction of the consultant, City of Puyallup, or the owner.

4.6 As-Built Plan

Following completion of construction activities, an as-built plan for the restoration area will be provided to the City of Puyallup. The plan will identify and describe any changes in relation to the original approved plan

5.0 Qualifications

As requested by Confluence, I have attached my qualifications to prepare this study in **Attachment C**. As defined in PMC 21.06.210(108) a "Qualified professional" or "qualified consultant" shall mean a person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant critical area subject in accordance with WAC 365-195-905(4). A qualified professional must have obtained a B.S. or B.A. or equivalent degree in biology, soil science, engineering, environmental studies, fisheries, geomorphology or related field, and two years of related work experience and meet the following criteria:

(a) A qualified professional for habitats or wetlands must have a degree in biology and professional experience related to the subject species;

As a wetland ecologist with a degree In Natural Resource Management (Wildlife Science) and over 36 years of professional experience I meet the definition of qualified professional.

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If you have any questions, please give me a call.

Sincerely,

ALTMANN OLIVER ASSOCIATES, LLC

John altman

John Altmann Ecologist

Attachments



COMMON NAME	DENSITY	QTY.	SIZE (MIN.)	NOTES
BIG LEAF MAPLE	9' O.C.	6	2 GAL.	SINGLE TRUNK, WELL BRANCHED
WESTERN HAZELNUT	9' O.C.	6	2 GAL.	MULTI-STEM (3 MIN.)
DOUGLAS FIR	9' O.C.	5	2 GAL.	FULL & BUSHY

DENSITY	QIY.		
6' O.C.	5	I GAL.	MULTI-STEM (3 MIN.)
6' O.C.	5	I GAL.	MULTI-STEM (3 MIN.)
6' O.C.	9	I GAL.	FULL & BUSHY
6' O.C.	10	I GAL.	MULTI-STEM (3 MIN.)
6' O.C.	12	I GAL.	MULTI-STEM (3 MIN.)
	DENSITY 6' O.C. 6' O.C. 6' O.C. 6' O.C. 6' O.C.	DENSITY QTT. 6' O.C. 5 6' O.C. 5 6' O.C. 9 6' O.C. 10 6' O.C. 12	DENSITY QTY. 6' O.C. 5 I GAL. 6' O.C. 5 I GAL. 6' O.C. 9 I GAL. 6' O.C. 10 I GAL. 6' O.C. 12 I GAL.





PO Box 578 Carnation, WA 98014 Office (425) 333-4535 Fax (425) 333-4509



City of Puyallup Parcel 042022-2008

Figure 1



- Roads

Hydro_Centerlines

0	500 1,000	2,000	3,000	4,000
				US Feet



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Environmental Planning & Landscape Architecture

City of Puyallup Parcel 042022-2008

Figure 2



- 300' Critical Area Assessment Boundary
- ZZZ Approximate Wetland A Cat. II





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Environmental Planning & Landscape Architecture

City of Puyallup Parcel 042022-2008

Critical Areas Map



Tax_Parcels



TAX PARCEL 042022-2008

VERTICAL DATUM

NAVD 88

BENCHMARK

HELD CITY OF PUYALLUP BENCHMARK NW-TODD 7 CONVERTED NGVD 29 ELEVATION OF 39.68' TO NAVD 88 ELEVATION OF 43.17 BY ADDING THE 3.49' PER CORPSCON DATA CONVERSION SOFTWARE

HORIZONTAL DATUM

NAD 83/(2011) WASHINGTON SOUTH ZONE PER THE WASHINGTON STATE REFERENCE NETWORK - CHECKED TO PIERCE COUNTY REFERENCE NETWORK VIA TIES TO FOUND MONUMENTS SM 3572 AND SM 3662

BASIS OF BEARINGS

HELD A BEARING OF S 01°02'07" W ALONG THE WEST LINE OF GOV'T LOT 5 FROM THE FOUND MONUMENT AT THE NW CORNER THEREOF TO A MONUMENT LOCATED ALONG THE EXTENSION OF SAID WEST LINE LOCATED AT THE CENTER OF INTERSECTION OF MERIDIAN AVE AND SPENCER RD E

INSTRUMENTATION

WAC 332-130-090.

INSTRUMENT USED: 5 SECOND TOTAL STATION. FIELD SURVEY WAS BY CLOSED TRAVERSE LOOPS, MINIMUM CLOSURE OF LOOPS WAS 1:22,000, IN ACCORDANCE WITH

LEGAL DESCRIPTION

BEGINNING AT A POINT 683 FEET EAST OF THE SOUTHWEST CORNER OF LOT 5 IN SECTION 22, TOWNSHIP 20 NORTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN; THENCE NORTH PARALLEL WITH THE WEST BOUNDARY OF SAID LOT, 442 FEET MORE OR LESS TO THE RIGHT OF WAY OF CHICAGO, MILWAUKEE & ST PAUL RAILWAY COMPANY; THENCE NORTHWESTERLY ALONG SAID RIGHT OF WAY 100 FEET: THENCE SOUTH PARALLEL WITH AND 93 FEET DISTANCE FROM EAST BOUNDARY OF TRACT 478 FEET MORE OR LESS TO A POINT 93 FEET WEST OF THE POINT OF BEGINNING;

THENCE EAST 93 FEET TO THE POINT OF BEGINNING. EXCEPT THE NORTHERLY 15 FEET FOR TODD ROAD

NORTHEAST.

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.

REFERENCES

ROS 201604295004 (R1)

ROS 202012225005

ROS 9005230358

CHICAGO, MILWAUKEE AND ST PAUL RR NORTH PUYALLUP TRACK MAPS

	CALLONS REVISIONS DESCRIPTION REVISIONS BY DATE	ND. N NOF W. 426 A26 A26 IST	MCC ASHING 101 76 ERED P	C THE PLANS SET FORTH ON THIS SHEET ARE AND SHALL REMAIN THE THE AND THE PLANS SET FORTH ON THIS SHEET ARE AND SHALL REMAIN THE THE THE AND THE PLANS SET FORTH ON THIS SHEET ARE AND SHALL REMAIN THE
	BOUNDARY TOPOGRAPHIC SURVEY	ROR	AMERICAN PRIDE LENDING, LLC	
		ENGINEERING & SURVEYING	Western Washington Division 165 NE Juniper Street, Suite 201 = Issaouah, WA 98027 = Phone: (425) 392-0250 Eastern Washington Division	407 Swiftwater Blvd. • Cle Elum, WA 98922 • Phone: (509) 674-7433
-	JOB NO	0.	2171 07/07	15
Ľ	SCALE		1"=3	7 <u></u> 30' A

SHEET 1 OF 1

APPROVED

SDM

ATTACHMENT A DATA SHEETS

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

Project Site:	Parcel: 04	42022-2	2008			Ci	ty/County:	Puya	allup/		Sampling D	ate:	6-2	3-22	
Applicant/Owner:	Sekhon									State: <u>WA</u>	Sampling P	oint:	DP	¥1	
Investigator(s):	John Altn	<u>nann</u>						Se	ection,	Township, Rang	ge: <u>S22, T2</u>	0N, R4E			
Landform (hillslope, ter	rrace, etc.)): <u>Sl</u>	ope			Local relie	ef (concave	, conve	x, non	e): <u>concave</u>		Slop	e (%):		
Subregion (LRR):	<u>A</u>			Lat:	47.210042			Long:	-122.	290862		Datum:	NAD8	<u>3</u>	
Soil Map Unit Name:	<u>31A</u>									NWI clas	sification:	PF010	;		
Are climatic / hydrologi	c conditio	ns on th	e site typical fo	r this tir	me of year?	Yes	\boxtimes	No		(If no, explain i	n Remarks.)				
Are Vegetation	Soil	□,	or Hydrology	□ , s	significantly dis	sturbed?	Are "Nor	mal Cir	cumst	ances" present?	•	Yes	\boxtimes	No	
Are Vegetation	Soil	□,	or Hydrology	□, r	naturally proble	ematic?	(If neede	ed, expl	ain an	y answers in Re	marks.)				

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

Hydrophytic Vegetation Present?		No	\boxtimes				
Hydric Soil Present?		No	\boxtimes	Is the Sampled Area within a Wetland?	Yes	No	\boxtimes
Wetland Hydrology Present?		No	\boxtimes				
Remarks: Upslope of OHW 1-2							

VEGETATION – Use scientific names of plant	s					
<u>Tree Stratum</u> (Plot size: <u>10'</u>)	Absolute % Cover	Dominant Species?	Indicator <u>Status</u>	Dominance Test Worksheet:		
1. <u>Alnus rubra</u>	<u>90</u>	yes	FAC	Number of Dominant Species	2	(A)
2. <u>Pseudotsuga menziesii</u>	<u>10</u>	<u>no</u>	<u>FACU</u>	That Are OBL, FACW, or FAC:	2	(A)
3				Total Number of Dominant	F	
4				Species Across All Strata:	<u>5</u>	(D)
50% = <u>50</u> , 20% = <u>20</u>	<u>100</u>	= Total Cover		Percent of Dominant Species	40	(A/D)
Sapling/Shrub Stratum (Plot size: 10')				That Are OBL, FACW, or FAC:	40	(A/D)
1. <u>Ilex aquifolium</u>	<u>40</u>	<u>ves</u>	<u>FACU</u>	Prevalence Index worksheet:		
2. <u>Oemleria cerasiformis</u>	<u>15</u>	<u>yes</u>	FACU	Total % Cover of:	Multiply by:	
3. <u>Corylus cornuta</u>	<u>10</u>	<u>no</u>	FACU	OBL species	x1 =	-
4. <u>Rubus armeniacus</u>	<u>10</u>	<u>no</u>	FAC	FACW species	x2 =	-
5				FAC species	x3 =	-
50% = <u>37.5,</u> 20% = <u>15</u>	<u>75</u>	= Total Cover		FACU species	x4 =	-
<u>Herb Stratum (</u> Plot size: <u>10'</u>)				UPL species	x5 =	-
1. <u>Equesetum telmetia</u>	<u>30</u>	yes	FACW	Column Totals: (A)		(B)
2				Prevalence Index = B/A =		
3				Hydrophytic Vegetation Indicators:		
4				1 – Rapid Test for Hydrophytic Vegetation	on	
5				□ 2 - Dominance Test is >50%		
6				\Box 3 - Prevalence Index is $\leq 3.0^1$		
7				4 - Morphological Adaptations ¹ (Provide	supporting	
8				data in Remarks or on a separate sh	eet)	
9				5 - Wetland Non-Vascular Plants ¹		
10				Problematic Hydrophytic Vegetation ¹ (E	xplain)	
11						
50% = <u>15</u> , 20% = <u>6</u>	<u>30</u>	= Total Cove		¹ Indicators of hydric soil and wetland hydrolog	jy must	
Woody Vine Stratum (Plot size: 10')						
1. <u>Hedera helix</u>	<u>100</u>	<u>ves</u>	FACU			
2				Hydrophytic		
50% = <u>50</u> , 20% = <u>20</u>	<u>100</u>	= Total Cover		Vegetation Yes Present?	NO	×
% Bare Ground in Herb Stratum						
Remarks:				·		

Project Site: Parcel: 042022-2008

SOIL

SOI	L								Sampling	Point: DP	<u>#1</u>		
Prof	ile Descr	iption: (Describe t	o the depth	n needed to d	ocument the ind	dicator or confi	rm the absenc	ce of indicato	ors.)				
D	epth	Matrix			Redox	Features							
(incł	nes)	Color (moist)	%	Color (mo	oist) %	Type ¹	Loc ²	Texture			Remark	S	
(0-15	<u>10 YR 3/3</u>	100					clay loa	<u>m</u>				
_													
_													
_			<u> </u>										
_			<u> </u>										
_													
_									·				
_			<u> </u>										
¹Тур	e: C= Co	ncentration, D=Dep	letion, RM=	Reduced Matr	ix, CS=Covered	or Coated Sand	Grains. ² L	Location: PL=	Pore Lining, N	//=Matrix			
Hydı	ric Soil Ir	dicators: (Applica	ble to all L	RRs, unless o	otherwise noted	l.)		Indic	ators for Pro	blematic l	Hydric S	Soils ³ :	
	Histoso	(A1)			Sandy Redox (S5)			2 cm Muck	(A10)			
	Histic E	pipedon (A2)			Stripped Matrix	(S6)			Red Parent	Material (TF2)		
	Black H	istic (A3)			Loamy Mucky	Mineral (F1) (ex	cept MLRA 1)		Very Shallo	w Dark Su	irface (T	F12)	
	Hydroge	en Sulfide (A4)			Loamy Gleyed	Matrix (F2)			Other (Expl	ain in Rem	narks)		
	Deplete	d Below Dark Surfa	ce (A11)		Depleted Matri	x (F3)							
	Thick D	ark Surface (A12)			Redox Dark Su	urface (F6)							
	Sandy M	/lucky Mineral (S1)			Depleted Dark	Surface (F7)		³ India	ators of hydro	ophytic veg	getation a	and	
	Sandy 0	Gleyed Matrix (S4)			Redox Depress	sions (F8)		ur	etiano nyoroio nless disturbe	d or proble	e presen matic.	it,	
Rest	rictive L	ayer (if present):											
Туре	:												
Dept	h (inches):					Hydric Soils	Present?		Yes		No	\boxtimes
Rem	arks:												

HYDROLOGY

Wetla	and Hydrology Indicat	ors:										
Prima	ary Indicators (minimum	of one re	equired	; check	all tha	apply)	Se	econdary Indicators (2 or	more requir	ed)		
	Surface Water (A1)					Water-Stained Leaves (B9)		Water-Stained Leave	s (B9)			
High Water Table (A2) (except MLRA 1, 2,						(except MLRA 1, 2, 4A, and 4B)		(MLRA 1, 2, 4A, and	4B)			
	Saturation (A3)					Salt Crust (B11)		Drainage Patterns (B	10)			
	Water Marks (B1)					Aquatic Invertebrates (B13)		Dry-Season Water Table (C2)				
	Sediment Deposits (B	2)				Hydrogen Sulfide Odor (C1)		Saturation Visible on	Aerial Image	ery (C9)	
	Drift Deposits (B3)					Oxidized Rhizospheres along Living Roots (C3)	5) (Geomorphic Position	(D2)			
Algal Mat or Crust (B4)						Shallow Aquitard (D3))					
	Iron Deposits (B5)					Recent Iron Reduction in Tilled Soils (C6)		FAC-Neutral Test (D5	FAC-Neutral Test (D5)			
	Surface Soil Cracks (E	36)				Stunted or Stresses Plants (D1) (LRR A)		Raised Ant Mounds (I	D6) (LRR A)		
	Inundation Visible on A	Aerial Ima	agery (E	37)		Other (Explain in Remarks)		Frost-Heave Hummo	cks (D7)			
	Sparsely Vegetated C	oncave S	Surface	(B8)								
Field	Observations:											
Surfa	ce Water Present?	Yes		No	\boxtimes	Depth (inches):						
Wate	r Table Present?	Yes		No	\boxtimes	Depth (inches):						
Satur (inclu	ation Present? des capillary fringe)	Yes		No	\boxtimes	Depth (inches): We	tland H	ydrology Present?	Yes		No	
Desc	ribe Recorded Data (str	eam gau	ge, mor	nitoring	well, a	erial photos, previous inspections), if available:						
Rem	arks: Dry											

ATTACHMENT B WETLAND RATING

RATING SUMMARY – Western Washington

Name of wetland (or	ID #): Parcel 042	0222008	Date of site visit:	3/1/2022						
Rated by Altmann		Yes 🗌 No	Date of training ()3/08 &03/15						
HGM Class used for rating Riverine & Fresh Water Tidal Wetland has multiple HGM classes? Ves Vo										
NOTE: Form is not complete with out the figures requested (<i>figures can be combined</i>). Source of base aerial photo/map Pierce County GIS										
OVERALL WETLA	ND CATEGORY	II	(based on	functions	⊡or specia	al characteristics \Box)				
1. Category of v	vetland based on Category 1 X Category 1 Category 1 Category 1 Category 1		Score for each function based on three ratings (order of ratings							
FUNCTION	Improving Water Quality	Hydrologic	Habitat			is not important)				
	List app	propriate rating	g (H, M, L)			· ,				
Site Potential	М	М	М			9 = H, H, H				
Landscape Potential	М	Н	L			8 = H, H, M				
Value	Н	Н	Н	Total		7 = H, H, L				
Score Based on Ratings	7	8	6	21		7 = H, M, M 6 = H, M, L				
					-	6 = M, M, M 5 = H, L, L 5 = M, M, 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

4 = M, L, L 3 = L, L, L

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	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
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)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	В
Hydroperiods	H 1.2	В
Ponded depressions	R 1.1	В
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	В
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	В
Width of unit vs. width of stream (can be added to another figure)	R 4.1	В
Map of the contributing basin	R 2.2, R 2.3, R 5.2	E
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	٨
polygons for accessible habitat and undisturbed habitat		~
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	С
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	D

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	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)	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	S 4.1	
(can be added to another figure)		
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 describ If hydrologic criteria listed in each que with multiple HGM classes. In this cas Question 8.	ned must apply to the entire unit being rated. Istion do not apply to the entire unit being rated, you probably have a unit se, identify which hydrologic criteria in questions 1 - 7 apply, and go to
1. Are the water levels in the entire u	nit 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 du	uring periods of annual low flow below 0.5 ppt (parts per thousand)?
NO - Saltwater Tidal Fring If your wetland can be class If it is Saltwater Tidal Fringe used to score functions for e	e (Estuarine)
2. The entire wetland unit is flat and p Groundwater and surface water runof	recipitation is the only source (>90%) of water to it. f are NOT sources of water to the unit.
☑ NO - go to 3 If your wetland can be class	Flats Flats Flats Flats ified as a Flats wetland, use the form for Depressional wetlands.
 3. Does the entire wetland unit meet a ☐ The vegetated part of the we plants on the surface at any ☐ At least 30% of the open wa 	all of the following criteria? etland is on the shores of a body of permanent open water (without any time of the year) at least 20 ac (8 ha) in size; tter 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 a The wetland is on a slope (s The water flows through the It may flow subsurface, as s The water leaves the wetland 	all of the following criteria? Slope can be very gradual), wetland in one direction (unidirectional) and usually comes from seeps. Sheetflow, or in a swale without distinct banks. Ind without being impounded.
☑ NO - go to 5	\Box YES - The wetland class is Slope
NOTE : Surface water does not pond i depressions or behind hummocks (de	n these type of wetlands except occasionally in very small and shallow pressions 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 wetland.*

□ 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.

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

RIVERINE AND FRESHWATER TIDAL FRINGE	WETLANDS	
Water Quality Functions - Indicators that the site functions to imp	prove water quality	
R 1.0. Does the site have the potential to improve water quality?		
R 1.1. Area of surface depressions within the Riverine wetland that can trap sed flooding event:	iments during a	
Depressions cover $> {}^{3}/_{4}$ area of wetland	points = 8	2
Depressions cover > ½ area of wetland	points = 4	2
Depressions present but cover < $\frac{1}{2}$ area of wetland	points = 2	
No depressions present	points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person heigh	t, not Cowardin	
classes)		
Trees or shrubs $> 2/3$ area of the wetland	points = 8	
\Box Trees or shrubs > $^{1}/_{3}$ area of the wetland	points = 6	8
\Box Herbaceous plants (> 6 in high) > $^{2}/_{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) > $^{1}/_{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous $< 1/3$ area of the wetland	points = 0	
Total for R 1 Add the points in	n the boxes above	10
Rating of Site Potential If score is: 12 - 16 = H 26 - 11 = M 0 - 5 = L	Record the rating on	the first page

R 2.0. Does the landscape have the potential to support the wa	ter quality function of the s	ite?	
R 2.1. Is the wetland within an incorporated city or within its UG	GA? Yes = 2	No = 0	2
R 2.2. Does the contributing basin to the wetland include a UGA incorporated area?	A or Yes = 1	No = 0	1
R 2.3. Does at least 10% of the contributing basin contain tilled pastures, or forests that have been clearcut within the last 5 years	fields, ars? Yes = 1	No = 0	0
R 2.4. Is > 10% of the area within 150 ft of the wetland in land u generate pollutants?	ses that Yes = 1	No = 0	1
R 2.5. Are there other sources of pollutants coming into the wet not listed in questions R 2.1 - R 2.4? Other Sources	land that are Yes = 1	No = 0	0
Total for R 2	Add the points in the boxe	es above	4

Rating of Landscape Potential If score is: 3 - 6 = H 1 or 2 = M 0 = L Record the rating on the first page

R 3.0. Is the water quality improvement provided by the site valua	able to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d)	list or on a	1
tributary that drains to one within 1 mi?	Yes = 1 No = 0	1
R 3.2. Is the wetland along a stream or river that has TMDL limits	s for	1
nutrients, toxics, or pathogens?	Yes = 1 No = 0	I
R 3.3. Has the site been identified in a watershed or local plan as	s important	
for maintaining water quality? (answer YES if there is a TMDL for	r the	0
drainage in which the unit is found)	Yes = 2 No = 0	
Total for R 3 A	Add the points in the boxes above	2
Rating of Value If score is: 2 - 4 = H 1 = M 0 = L	Record the rating or	the first page

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS	
Hydrologic Functions - Indicators that site functions to reduce flooding and stream eros	sion
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides:	
Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).	
If the ratio is more than 20 points = 9	2
If the ratio is 10 - 20 points = 6	
If the ratio is 5 - < 10 points = 4	
If the ratio is 1 - < 5 points = 2	
If the ratio is < 1 points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: <i>Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are <u>NOT Cowardin</u> classes).</i>	_
Forest or shrub for > $\frac{1}{3}$ area OR emergent plants > $\frac{2}{3}$ area points = 7	(
Forest or shrub for $> 1/10$ area OR emergent plants $> 1/3$ area points = 4	
Plants do not meet above criteria points = 0	
Total for R 4 Add the points in the boxes above	9
Rating of Site Potential If score is: 12 - 16 = H G - 11 = M 0 - 5 = L Record the rating or	the first page

R 5.1. Is the stream or river adjacent to the wetland downcut?Yes = 0No = 11R 5.2. Does the up-gradient watershed include a UGA or incorporated area?Yes = 1No = 01	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0 1	
R 5.3 Is the up-gradient stream or river controlled by dams? Yes = 0 No = 1 1	
Total for R 5Add the points in the boxes above3	

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

R 6.0. Are the hydrologic functions provided by the site valuable to society?		
R 6.1. Distance to the nearest areas downstream that have flooding problems	?	
Choose the description that best fits the site.		
The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)	points = 2	2
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	
R 6.2. Has the site been identified as important for flood storage or flood		0
conveyance in a regional flood control plan?	Yes = 2 No = 0	•
Total for R 6 Add the points	in the boxes above	2
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 $\frac{1}{4}$ ac or more than 10% of the unit if it is smaller	
than 2.5 ac. Add the number of structures checked.	
\Box Aquatic bed 4 structures or more: points = 4	1
Emergent 3 structures: points = 2	I
\Box Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points - 1	
\Box 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 1/4 ac to count (see text for descriptions of	
nydroperiods).	
\Box Permanently flooded or inundated 4 or more types present: points = 2	
\Box Fermininentity hooded or infundated 4 of more types present: points = 3	1
\Box Seasonally flooded of mundated S types present, points = 2	I
Occasionally nooded of infundated 2 types present: points = 1 1 types present: points = 0	
Calculated only I types present, points = 0 Comparently flowing stream or river in, or adjacent to the wetland	
Seasonally flowing stream in, or adjacent to the wetland	
\square Jake Fringe wetland 2 points	
□ Ease Finige 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	
<pre>< 5 species points = 0</pre>	
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 mudflate)	
is high moderate low or none. If you have four or more plant classes or three classes and open	
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	
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.	
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.	
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.	
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.	
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.	0
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.	0
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. None = 0 points Low = 1 point Moderate = 2 points	0
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. None = 0 points Low = 1 point Moderate = 2 points	0
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. None = 0 points Low = 1 point Moderate = 2 points	0
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. None = 0 points Low = 1 point Moderate = 2 points All three diagrams	0
Idescribed in TTTTT, of the classes and divegented areas (can include open water of mudiats) 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. None = 0 points All three diagrams in this row are	0
Idescribed in TTET, of the classes and divegented areas (can include open water of mutuals) 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. None = 0 points All three diagrams in this row are HIGH = 3 points	0
Idescribed if TTTTT), of the classes and drivegetated areas (can include open water of indunats) 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. None = 0 points Low = 1 point All three diagrams in this row are HIGH = 3 points	0
All three diagrams in this row are HIGH = 3 points	0

Wetland name or number A	
H 1.5. Special habitat features:	
Check the habitat features that are present in the wetland. <i>The number of checks is the number</i>	
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)	3
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 (<i>cut shrubs or trees</i>	
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 (<i>structures for egg-laying by amphibians</i>)	
□ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see	
H 1.1 for list of strata)	
Total for H 1 Add the points in the boxes above	7

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:		
0.4 % undisturbed habitat + (0 % moderate &	low intensity land uses / 2) = 0.4%	
If total accessible habitat is:		0
> 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	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.		
Calculate:		
0 % undisturbed habitat + (18 % moderate &	low intensity land uses / 2) = 9%	
		0
Undisturbed habitat > 50% of Polygon	points = 3	Ū
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	
H 2.3 Land use intensity in 1 km Polygon: If		
> 50% of 1 km Polygon is high intensity land use	points = (-2)	-2
≤ 50% of 1km Polygon is high intensity	points = 0	
Total for H 2	Add the points in the boxes above	-2

Rating of Landscape Potential If Score is: 4 - 6 = H 1 - 3 = M 2 < 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 po	olicies? 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	e)
It provides habitat for Threatened or Endangered species (and the species)	ny plant
or animal on the state or federal lists)	
It is mapped as a location for an individual WDFW priority sp	becies a
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 loca	ll or
regional comprehensive plan, in a Shoreline Master Plan, or	in a
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

City of Puyallup Parcel 042022-2008





1 Km Habitat Classification Polygon Accessible Relatively Undisturbed Habitat 0.4%

- XXX Accessible Low_Moderate Intensity Habitat 0%
- Accessible Relatively Undisturbed Habitat 0%
- XXX Low_Moderate Intensity Habitat 18.0%
- Wigh Intensity Habitat 81.6%





Environmenta Planning & Landscape

Architecture

AOA - 6739



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City of Puyallup Parcel 042022-2008



Figure B

- ZZZ Approximate Wetland A
- 150' Pollution Assessment Polygon
- In the second se



6739 Figure C



0.05 0.1

0

0.2

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and



6739 Figure D



0

0.125

0.25

0.5

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and



Figure E Rough Basin





Disclaimer: The map features are approximate and have not been surveyed. Additional features not yet mapped may be present. Pierce County assumes no liability for variations ascertained by formal survey.

Date: 3/17/2022 10:44 AM





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JOHN J. ALTMANN, PRINCIPAL

Ecologist, Project Manager

Wetland Delineations, Stream Studies, Functional Analysis, Mitigation, Environmental Impact Assessments, Planning, Regulatory Analysis & Permitting, Wildlife Studies

EXPERIENCE

Mr. Altmann has 36 years of experience working in resource and environmental planning, project management, and field analysis. His main area of concentration is wetlands and streams and his experience includes: delineations; environmental assessments; impact statements; mitigation plans; natural resource inventories and sensitivity analyses; site planning; and wildlife habitat management studies in Washington, Oregon, Idaho, Alaska, California, Wyoming, New Jersey, New York, and Pennsylvania.

REPRESENTATIVE PROJECTS

Responsible for over 4,000 wetland and wildlife studies conducted in past 36 years, with most of these projects occurring in King, Snohomish, Skagit, Whatcom, Pierce, Thurston, Clark, Lewis, Kitsap, and Mason counties in Washington State. Most of these projects involved analysis of wetland and stream conditions in relation to some proposed construction activity that could potentially affect their functions and values. Many of the studies involved delineation only, whereas others required determination of wetland functions and values and wetland impact mitigation planning and other sensitive areas analyses. Project sizes ranged from under 1 acre to over 600 acres, with the wetlands on these properties being nearly as variable as their size. Wildlife studies include flora and fauna inventories, habitat impact assessments, and threatened and endangered species studies. Some of the projects representative of this experience are listed below.

Shoreline Delineation & Habitat Assessment for private land owners on Lake Sammamish, Bellevue, WA

Wetland Mitigation and Long-Term Monitoring for Weyerhaeuser Real Estate Development Company's Mint Farm Phase II project in the City of Longview, WA

Stream Delineation Study, Mitigation Plan for the Greystone PRD, Redmond, WA

Wetland Delineation and Study for the Group Health Support Facility in the City of Tukwila, WA

Critical Areas Delineation, Study, and Mitigation Plan for the Cadman High Rock Quarry in Snohomish County, WA

Critical Areas Delineations, Studies, and Mitigation Plans for the Microsoft Corporate Campus in the City of Redmond, WA

- *Critical Areas Study, Mitigation Plan, Biological Assessment, and Long-Term Monitoring* on 90-acre Northpointe Corporate Campus for OPUS NW in Snohomish County, WA
- Wetland Delineation, Study, and Mitigation Plan for the Puyallup Downs Residential Development in the City of Puyallup, WA
- *Wildlife Study* on 40-acre Site in North Bend Area of King County, WA for Private Developer
- *Critical Areas Delineation and Study* for Data I/O Corporation in Redmond, WA for the Quadrant Corporation
- Sensitive Areas Assessment for 74-acre Church site in Redmond, King County, WA
- *Wetland Delineation* on 47-acre Marine Industrial Site Location in Snohomish River Estuary, Everett, Snohomish County, WA for Private Developer
- *Wetland Study and Mitigation Plan* for 37-acre Office Park Site in Redmond, King County, WA for Private Developer

Wetland Maintenance and Monitoring Plan for Property on Raging River in King County, WA for Private Developer

OTHER PROJECT EXPERIENCE

- Wetland Biologist for the King County Parks, Planning and Resource Department, Environmental Division, Resource Planning Section. Mapped, classified, inventoried and rated the wetlands in the cities of Kirkland, Bothell, Normandy Park, Duvall, and Lake Forest Park for inclusion in the King County Sensitive Areas Folio.
- Research Assistant for the NJ Division of Fish, Game and Wildlife's Endangered and Nongame Species Program. Responsible for the research, feeding, and monitoring of osprey fledglings for 3 seasons of the NJ osprey hacking program. Responsible for the collection and analysis of information pertaining to population size and migration along with species density and behavior of shorebirds along the Delaware Bay.
- Research Assistant for the NJ Division of Fish, Game and Wildlife. Responsible for the collection, processing and analysis of biological information pertaining to the whitetail deer population in NJ.

EDUCATION

B.S., Natural Resource Management, Wildlife Science Option, Rutgers University, Cook College, New Brunswick, NJ.

PROFESSIONAL MEMBERSHIPS

Society of Wetland Scientists The Wildlife Society