



TECHNICAL MEMORANDUM

Date: February 6, 2020

To: Eric Veloni, Landowner
Scott McCormick, Associate Planner, Thurston County Development Services

Cc: Zachary Meyer, Wetlands/Shorelands Specialist

From: Larry Dominguez, Environmental Manager, Senior Ecologist

Subject: FEMA Habitat Assessment

Gentlemen, please find the attached FEMA Habitat Assessment. We provide this with the understanding that previous documentation submitted for shoreline work (JARPA, Shoreline Application, supporting effects analysis) could also be used as a resource evaluation.

Scott, I received the WA Department of Ecology comments on their Jan 23, 2020. This additional information may also serve Zachary Meyer's request for a site visit.

Thank you for your consideration of this information to satisfy FEMA Habitat Assessment requirements.

A handwritten signature in blue ink that reads "Larry Dominguez". The signature is written in a cursive, flowing style.

Table of Contents

1.0 Introduction.....	2
2.0 Critical Area Qualifications	2
3.0 Project Baseline Conditions	2
3.1 Background Research	2
Soils Information	2
Critical Areas	2
Thurston County Shoreline Master Program	2
WDFW Priority Habitats and Species	2
WA Department of Ecology	2
4.0 Project Area Habitat	4
4.1 Protected Species Identification.....	4
4.2 Site Investigation	4
4.3 Habitat Observations	4
4.4 Floodplain Functions	5
5.0 Project Description	5
6.0 Impact Assessment.....	5
6.1 Cumulative Impacts	5
6.1 Effects Analysis	6
6.1.1 Water Quality	6
6.1.2 Flood Velocities.....	6
6.1.3 Flood Storage Capacity.....	7
6.1.4 Riparian Vegetation.....	7
6.1.5 Habitat Forming Processes	7
6.1.6 Refuge from Higher Velocity Floodwaters	8
6.1.7 Spawning Substrate	9
6.1.8 Cumulative Impacts.....	9
7.0 Mitigation Sequencing	9
8.0 Determination.....	10
Limitations and Use of this Report.....	10

1.0 Introduction

The main purpose of this report is to determine the presence of critical fish and wildlife habitat features within the vicinity of the project area and to determine the likelihood that the development activity will have adverse impacts on the floodplain functions that these priority species and habitats depend on.

2.0 Critical Area Qualifications

KPFF Consulting Engineers provides environmental consultation for development projects; we specialize in natural resource assessment, floodplain impact analysis, critical area assessments, wetland delineations, shoreline development, restoration and mitigation planning. Larry Dominguez, the Qualified Biologist for this project has a Master's Degree in Environmental Studies with emphasis in Aquatic and Watershed Science. He has 30 years of professional experience in regulatory compliance, riparian and aquatic science, and wetland and nearshore ecology and fisheries science. KPFF regularly performs critical areas analyses for private and public agency projects in western Washington.

3.0 Project Baseline Conditions

3.1 Background Research

KPFF biologists reviewed the following resources in addition to conducting a site visit to fully evaluate the site and any potential impacts from the proposed construction activities.

Soils Information

Natural Resource Conservation Science Soils Survey (N. R. Service 2017) was used to assess local soil components prior to the field visit.

Critical Areas

Thurston County website was used to identify any regulated critical areas under *Thurston County Code 24.01* in the subject parcel.

Thurston County Shoreline Master Program

The Thurston County Shoreline Master Program Map was evaluated to identify the shoreline designation for the subject parcel.

WDFW Priority Habitats and Species

Washington Department of Fish and Wildlife's Priority Habitat Species Map was used to analyze any critical habitat and listed species in the project area (Wildlife 2019).

WA Department of Ecology

The Department of Ecology website was used to collect watershed information and drift cell analysis.

Location Information	
Address	5725 Sunrise Beach Road NW
City and County	Olympia, WA Thurston County
Lat. –Lon.	47°08'55.65" 122°99'66.32"
Tax Parcel No	13936340700
Landowner Type	Private
Water Resources Information	
Water Body	The Project is located within the Kennedy/Goldsborough Water Resource Inventory Area (WRIA) #14 on the western shoreline of Eld Inlet, South Puget Sound. The project affects no streams.
Shoreline Management Area Information	The lowest portion of the parcel is in a floodzone and within the 100 ft. buffer of Shoreline Management Area. Shoreline is designated as Rural shoreline in the Thurston County Shoreline Master Program Map.
Critical Areas	There are no wetlands or high groundwater or tidal flood hazards on the parcel. There are no special flood hazard areas associated with the parcel (Eld Inlet and Mud Bay contains estuarine and nearshore habitat, tidal sloughs, freshwater springs, coastal shorelines and forested uplands and classified wetlands).
Fish and Wildlife Habitat Conservation Areas	
Conservation Area	Harbor Seal Critical Habitat north and opposite side of Eld inlet Shorebird concentrations in southern portion of Eld inlet Chinook, Coho and pink salmon essential fish habitat
Species	Chinook salmon (marine area) Marbled murrelet: no presence (<i>source</i> : PHS database 3/1/2013 update) Forage fish survey: surf smelt spawn present on beach south of the subject property

4.0 Project Area Habitat

4.1 Protected Species Identification

The following protected species occur in the project site area and adjacent shorelines:

Species Name	Common Name	Use of Habitat
<i>Hypomesus pretiosus</i>	Surf Smelt	Spawning Area
	Hardshell Clam	Breeding Area
<i>Myotis lucifugus</i>	Little Brown Bat	Breeding Area
<i>Ammodytes hexapterus</i>	Pacific Sand Lance	Spawning Area
<i>Clupea pallasii</i>	Pacific Herring	Spawning Area

This site has a shoreline on Puget Sound and could also impact highly mobile species such as Chum salmon (*Oncorhynchus keta*), Chinook salmon (*Oncorhynchus tshawytscha*), Pink salmon (*Oncorhynchus gorbuscha*), King salmon (*Oncorhynchus mykiss*), Silver salmon (*Oncorhynchus kisutch*), bull trout (*Salvenius confluentus*) and steelhead (*Oncorhynchus mykiss*).

4.2 Site Investigation

KPFF Consulting Engineers visited the project site in June 2019 to evaluate the boat house and retaining wall maintenance activities as well as the existing habitat on the subject parcel. Observations were conducted at low tide to fully evaluate the shoreline conditions and how the subject parcel contributes to the shoreline environment in Eld Inlet.

4.3 Habitat Observations

Nearshore Conditions

The nearshore conditions show a diverse sediment/gravel deposit which is conducive to forage fish species. Drift cell analysis indicates that sediment is being transported from west to east along property shoreline. 90% of the substrate is 1.5" minus gravel.

Riparian Conditions

The Applicant's house is in upland forest habitat, connected to Puget Sound shoreline by a steep slope. Hillside vegetation community is mainly herbaceous with the dominant species being English Ivy (*Hedera helix*) and Salal (*Gaultheria shallon*). Other species present are scouring horsetail (*Equisetum hyemale*), big leaf maple (*Acer macrophyllum*) saplings, wild pea (*Lathyrus sp.*) and trace amounts of ornamental species and trailing blackberry (*Rubus ursinus*). There are three old-growth Douglas fir (*Pseudotsuga menziesii*) trees and one big-leaf maple (*Acer macrophyllum*) growing from the hillside. A concrete staircase leads from the home down to the shoreline.

Invasive species cover (English Ivy) in the hillside is functioning as a viable slope stability measure. Previous removal attempts have shown deep old-growth roots. Wholesale removal of the ivy would result in a destabilization of the top soil. We recommend planting small pockets of native species in the ivy cover to promote species diversity without compromising bank stability.

4.4 Floodplain Functions

Baseline ecological floodplain functions are practically non-existent because water surface above mean-high-high water will engage the bulkhead. The longstanding presence of a concrete bulkhead along the waterfront has minimized connectivity to flood levels. Overwash from extreme high tides and wave action encounter a concrete walkway and retaining wall which dissipates wave energy.

Water quantity and quality functions including temperature control, groundwater changes, pollutants of stormwater and changes to flood velocities and volumes are important factors to consider while evaluating the potential impact of constructed or proposed construction projects within the floodplain protected area. Due to the natural baseline of steep bank prior to the structure, this project proposes a minimal increase in impervious surface since the exposure of the boathouse and upland retaining wall primarily occurs with combined extreme high tides and additional wave height. Some infiltration will occur through pavers during instances of wave overwash and will have a negligible effect on these floodplain functions.

5.0 Project Description

The applicant removed previously existing concrete block retaining wall in the hillside and replaced them with new cottage stones. The applicant also repaired the boat house by installing new siding and a new roof. The purpose of the retaining wall update was to increase bank stability and the longevity of the retaining wall. The purpose of upgrading the boat house was to maintain the life of the boat house being exposed to the shoreline weather. The retaining wall was replaced with more stable materials (13" x 6" interlocking cottage stones) to improve steep slope bank stability. The applicant updated the boat house to improve weathering functions—updated siding and installed new metal roof.

6.0 Impact Assessment

Project Element	Direct Impacts	Indirect Impacts
Retaining Wall	• Sediment transport disruption • Increased wave refraction during extreme storm events • There may have been erosion during construction—no current evidence	• Disruption in food web and vegetation community • Disruption from bluff-derived sediment input
Boat House Upgrades	• Disruption in rainfall runoff pattern	

6.1 Cumulative Impacts

The cottage stone retaining wall was installed in order to increase/maintain bank stabilization. The replacement retaining wall is in the same footprint as the original retaining wall and

provides bank stability thus securing properly functioning slope protection conditions for the property.

The new roof on the boat house was designed with an overhang extent that allows any run-off on the upland side to either fall on the stone of the top of the retaining wall where the energy will be dissipated and the water will slowly flow into the soil. On the beach side, the runoff falls directly onto the bulkhead which again dissipates energy and prevents erosion.

All project actions were within the baseline project footprint and offered a slight improvement over how water runoff is managed in the beach interface.

6.1 Effects Analysis

6.1.1 Water Quality

There are no indications that bare soils eroded during the construction of the new retaining wall. The construct approach was to replace stacking, interlocking stones immediately upon removal of the old wall. Precipitation runoff from the new roof on the boathouse is re-directed onto pavers or atop the bulkhead where the energy dissipates readily before entering the Sound.

6.1.2 Flood Velocities

The VE zone extends to elevation 18' visually displayed in photo below.



Figure 1—Overwash above the bulkhead will encounter pavers and stacked interlocking stone of the upland retaining wall. The yellow line represents approximate base flood elevation (18ft.) for Zone VE based on topographic survey.



Figure 2 Water runoff from roof will distribute through upland vegetation. The yellow line represents the base flood elevation (18ft.) for Zone VE.

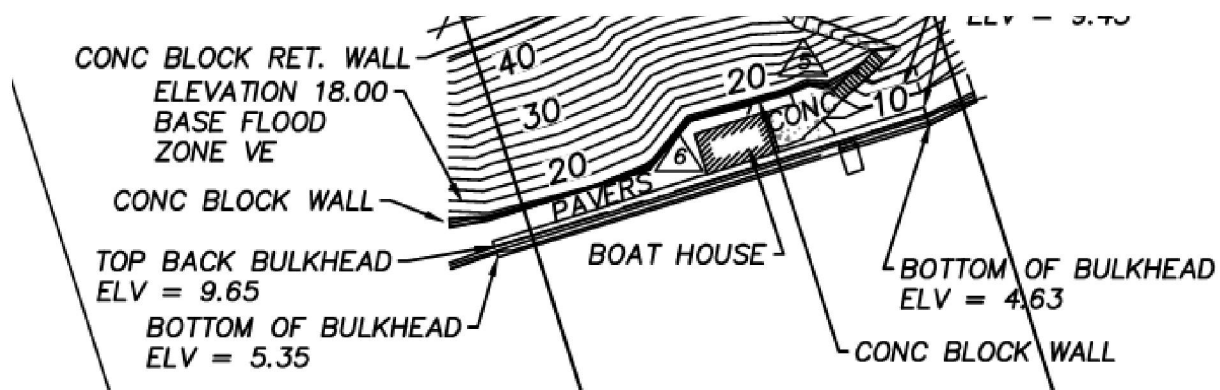


Figure 3—Screen capture of parcel survey depicting the base flood elevation above the retaining wall

6.1.3 Flood Storage Capacity

The natural bluff does not offer flood storage capacity due to slope steepness.

6.1.4 Riparian Vegetation

The boat house upgrades did not have any effect on the riparian vegetation.

The retaining wall is working with the English Ivy as a slope stabilization system. There are no native species on the hillside that were affected by the replacement of the retaining wall.

6.1.5 Habitat Forming Processes

The bulkhead maintains a disconnection between tidal waters and natural shoreline bluff. Nearby small tributaries recruit gravel and sand to area beaches and the subject parcel beach

appears to be in an equilibrium state as evidence by neither chronic bulkhead footer exposure nor extensive accretion. Although the subject parcel has SW exposure to wind and wave energy during storm events, this Mud Bay portion of Eld Inlet, with limited fetch, does not create serious wave and overwash flood or erosion hazards on the parcel. A prominent left to right drift cell along the shoreline replenishes the beaches from suspended sediment sources of McClane Creek, but primarily from local bluffs and tributaries.



Figure 4—Sediment drift (left to right) along the shoreline of Mr. Veloni's parcel

6.1.6 Refuge from Higher Velocity Floodwaters

There is no refuge from high velocity flood waters as the flood elevation (18 ft) is above the retaining wall and bulkhead.

6.1.7 Spawning Substrate

This site is listed by the Department of Fish and Wildlife as a smelt spawning site. The replacement of the retaining wall and boat house upgrade did not negatively impact the forage fish spawning substrate. In spite of the retaining wall—which is stabilizing the hillslope—there is still sufficient sediment input to support forage fish spawning habitat. At certain elevation bands favorable sand-sized particles may be absent but regular tide intervals deposit fine sediment at the upper extent of the tide. Sand abundance, mixed with gravel, varies throughout the beaches on nearby parcels.



Figure 5—General characteristic of substrate 10ft. seaward from the bulkhead. Finer particles are present in other areas and at higher tide marks.

6.1.8 Cumulative Impacts

The landscape is high-banked with steep slopes; it did not provide substantial flood storage even in its natural state so we do not believe that the retaining wall will have any effect on flood storage in the future.

The boat house sits on top of a bulkhead and is elevated on pillars, which provides space for overwash to continue on shore. This type of maintenance on a boat house structure would normally be exempt, however this boat house never received permitting for its original construction. The impermeable surface area of the roof does not add to the original footprint surface since that was comprised of pavers. At a minimum, the positive effect is that some of the water coming from the roof is dissipated landward and upward onto vegetation.

7.0 Mitigation Sequencing

The upland retaining wall and boathouse are within the footprint of previously existing structure, we do not believe mitigation is needed for this project.

8.0 Determination

Our site inspection of the proposed project did not identify critical fish and wildlife habitat conservation areas, ESA listed species, or protective buffers on or adjacent to the site that would experience adverse modification or long-term reduction of critical floodplain functions by approval of the development. Based on our evaluation and considering the location of the proposed development project, the timing of the project, the species known to utilize the site and its surroundings, the current condition of the site and the localized habitats we must conclude that the project is not likely to adversely affect critical areas or listed species including their resources.

Limitations and Use of this Report

This Critical Areas Report is supplied to Eric Veloni as a means of determining whether any floodplain functions on or adjacent to the site would affect the permit requirements of past site development. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the regulations currently in effect. The work for this report has conformed to the standard of care employed by professional ecologists. No other representation or warranty, expressed or implied, is made concerning the work or this report. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions and combined with previous efforts in Shoreline permit filing and critical areas assessment. The laws applicable to Flood Hazard Zones, Critical Areas and Shoreline Environments are subject to varying interpretations. While KPFF Consulting Engineers upheld professional industry standards when completing this review, the information included in this report does not guarantee approval by any federal, state, and/or local permitting agencies. If any questions arise regarding this review, please contact Larry Dominguez at 360-292-4695.

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
OTHER FEATURES		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped

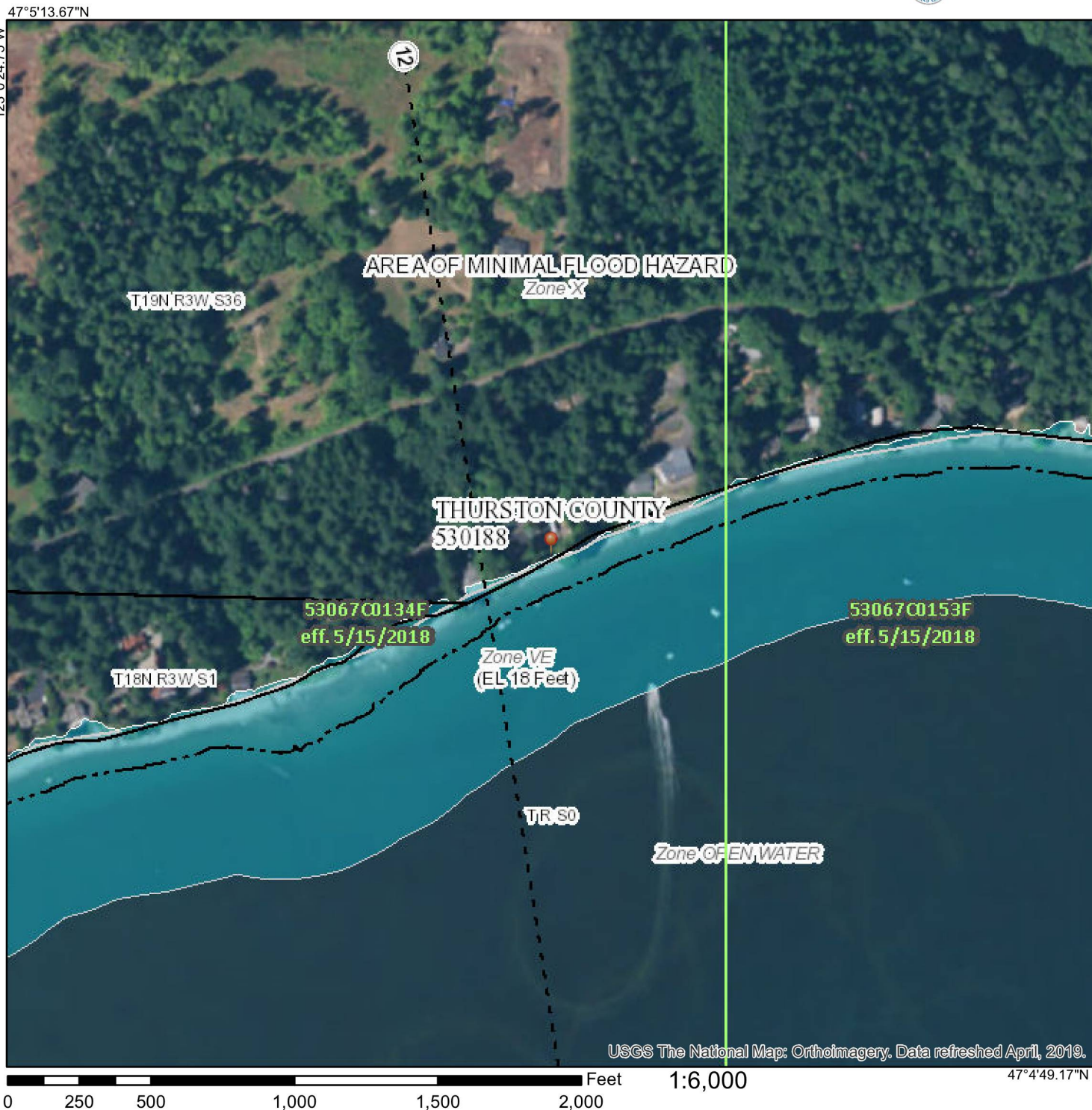


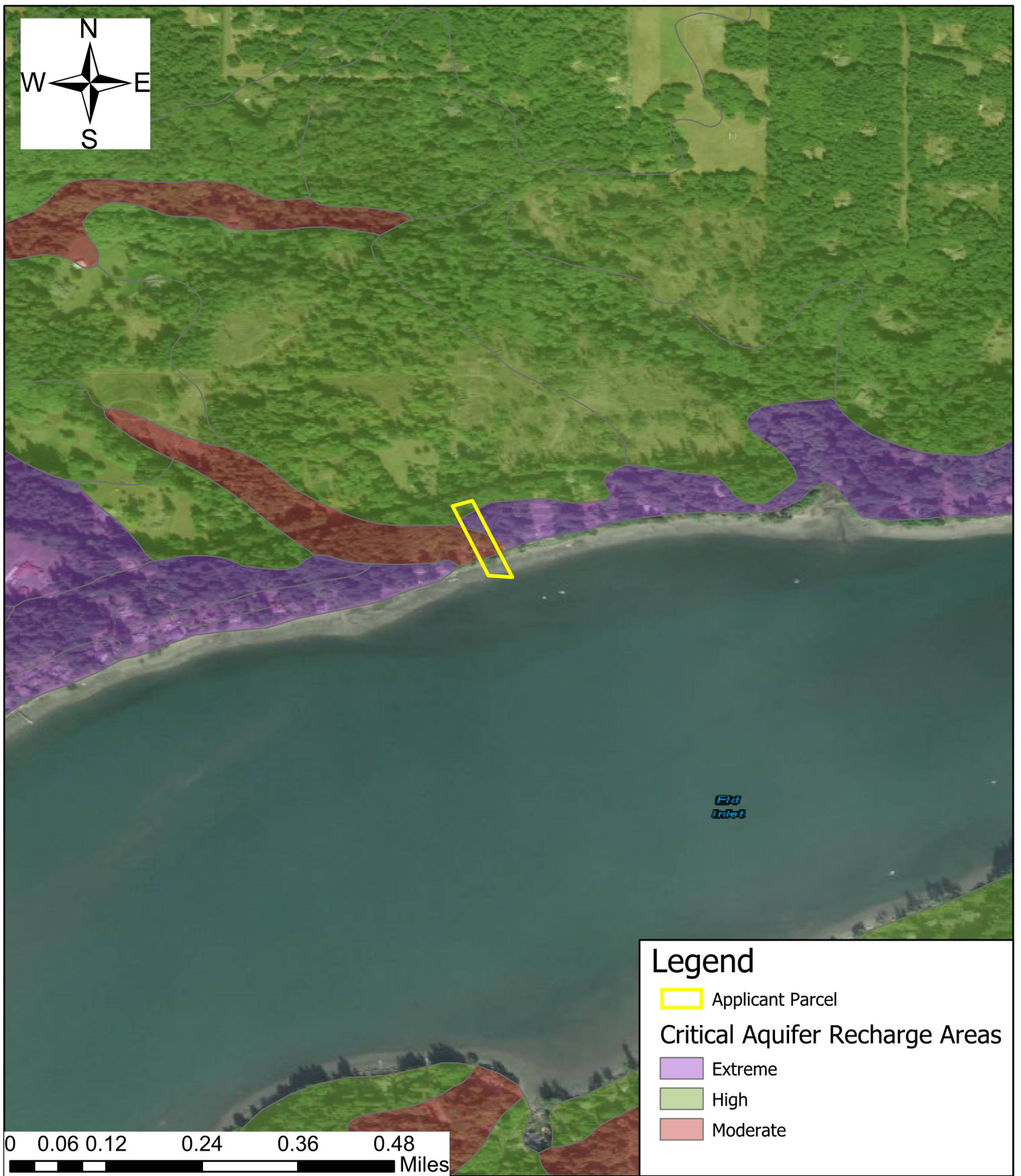
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **12/31/2019 at 7:37:35 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



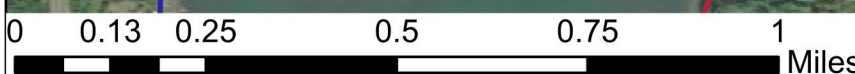


PROJ. NO. 10181900055



612 Woodland Square Loop,
Suite 100
Lacey, WA 98503
360.292.7230
www.kpff.com

Veloni JARPA
FEMA Habitat Assessment
Critical Aquifer Recharge Areas (Thurston County)



PROJ. NO. 10181900055



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Veloni JARPA
FEMA Habitat Assessment
Shoreline Drift Cells (Department of Ecology)

Legend

Driftcells

- Divergence Zone
- Left to Right
- No Appreciable Net Drive
- Right to Left

Applicant Parcel

- Applicant Parcel

Legend:

- Natural
- Conservancy
- Deschutes River SMA
- Percival SMA
- Rural
- Urban
- Urban Growth Areas
- Major Roads
- Railroads
- Streams

0 2 4 6 8 10 Miles



Thurston County makes every effort to ensure that this map is a true and accurate representation of the work of County Government. However, the county and all related personnel make no warranty, express or implied, regarding the accuracy, completeness or convenience of any information disclosed on this map. Nor does the County accept liability for any damage or injury caused by the use of this map.

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Johnson County Planning Department
27 June 2013 : Ed

Soil Map—Thurston County Area, Washington (Veloni)



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

2/4/2020
Page 1 of 3

Soil Map—Thurston County Area, Washington (Veloni)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Thurston County Area, Washington

Survey Area Data: Version 13, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2018—Jul 27, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

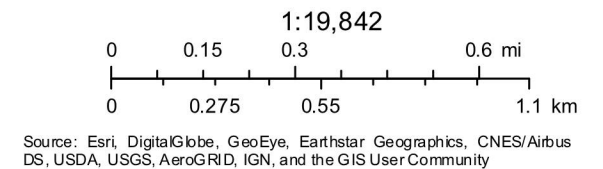
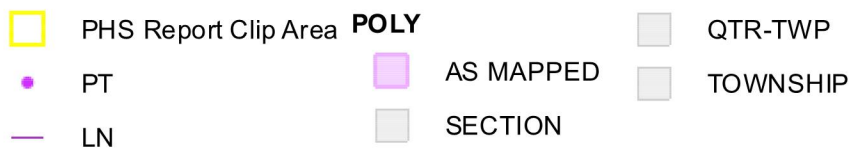
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
33	Everett very gravelly sandy loam, 8 to 15 percent slopes	0.6	4.8%
35	Everett very gravelly sandy loam, 30 to 50 percent slopes	2.1	17.9%
39	Giles silt loam, 3 to 15 percent slopes	5.0	42.9%
53	Kapowsin silt loam, 30 to 50 percent slopes	2.2	18.7%
Totals for Area of Interest		11.7	100.0%

WDFW Test Map



February 4, 2020





WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPublic
REPORT DATE: 02/04/2020 7.53

Query ID: P200204075308

Common Name	Site Name	Priority Area	Accuracy	Federal Status	Sensitive Data	Source Entity
Scientific Name	Source Dataset	Occurrence Type		State Status	Resolution	Geometry Type
Notes	Source Record	More Information (URL)		PHS Listing Status		
Source Date		Mgmt Recommendations				
Estuarine and Marine	N/A	Aquatic Habitat	NA	N/A	N	US Fish and Wildlife Service
	NWIIWetlands	Aquatic habitat		N/A	AS MAPPED	Polygons
		http://www.ecy.wa.gov		PHS Listed		
Estuarine and Marine	N/A	Aquatic Habitat	NA	N/A	N	US Fish and Wildlife Service
	NWIIWetlands	Aquatic habitat		N/A	AS MAPPED	Polygons
		http://www.ecy.wa.gov		PHS Listed		
Hardshell Clam	Not Given	Presence	NA	N/A	N	WDFW
	Shellfish_Summary	Presence		N/A	AS MAPPED	Polygons
		N/A		PHS Listed		
Little Brown Bat		Breeding Area	GPS	N/A	Y	WA Dept. of Fish and Wildlife
Myotis lucifugus	WS_OccurPoint	Biotic detection		N/A	TOWNSHIP	Points
	141077					
	June 03, 2004	http://wdfw.wa.gov/publications/pub.php?		PHS LISTED		
Surf Smelt	Station Number: 17	Breeding Area	NA	N/A	N	WDFW
Hypomesus pretiosus	Forage_Fish_Survey	Breeding area		N/A	AS MAPPED	Lines
	5343					
	January 10, 2004			PHS Listed Species		
Surf Smelt	Station Number: 14	Breeding Area	NA	N/A	N	WDFW
Hypomesus pretiosus	Forage_Fish_Survey	Breeding area		N/A	AS MAPPED	Lines
	3608					
	November 04, 1987			PHS Listed Species		
Surf Smelt	Station Number: 4	Breeding Area	NA	N/A	N	WDFW
Hypomesus pretiosus	Forage_Fish_Survey	Breeding area		N/A	AS MAPPED	Lines
	26080					
	October 21, 2014			PHS Listed Species		

Common Name	Site Name	Priority Area	Accuracy	Federal Status	Sensitive Data	Source Entity
Scientific Name	Source Dataset	Occurrence Type		State Status	Resolution	Geometry Type
Notes	Source Record	More Information (URL)		PHS Listing Status		
	Source Date	Mgmt Recommendations				
Surf Smelt	Station Number: 2	Breeding Area	NA	N/A	N	WDFW
Hypomesus pretiosus	Forage_Fish_Survey	Breeding area		N/A	AS MAPPED	Lines
	25739					
	August 20, 2014			PHS Listed Species		
Surf Smelt	Station Number: 9	Breeding Area	NA	N/A	N	WDFW
Hypomesus pretiosus	Forage_Fish_Survey	Breeding area		N/A	AS MAPPED	Lines
	28241					
	October 23, 2015			PHS Listed Species		

DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necessary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.