

SHORELINE AREA (Reach Code): SQUALICUM 6
REACH NUMBER: 6

Land Use	Current Land Use	The majority of the reach is undeveloped. One area of commercial use located between I-5 and James (on north side of creek), residential multi located south of creek east of James street. Potential for further development does exist in a large portion of the reach, both east and west of I-5. (Ref# 8,37,71)
	Zoning	49.7 acres industrial, 34.6 acres public, 19.6 acres institutional, 8.0 acres residential multi-family, 1.3 acres commercial, 0.7 acres institutional/ residential multi-family, 0.7 acres single family residential. (Ref# 54,104)
Potential Species Present	Wildlife species	In Approximately 83% of the reach: presence of an abundance of garter snakes and lizards with denning habitat; a variety of non-urban mammals, including habitat specific species; a variety of non-urban birds, including habitat specific species; and salamanders or newts and frogs. Large and medium animal movement is easy in 54% of the reach; and movement is possible for all sizes of animals, including amphibians in 32% of the reach. (Ref# 61,69,70,105)
	Fish species	Chinook, Coho, Sea-run Cutthroat, Steelhead. Presumed for Bull trout and Chum. Bug Lake and Tributary W presumed potential/historic use for Chum, Coho, Steelhead, Sea-run Cutthroat and Bull trout. (Ref# 69,70,94,105)
	PHS species/habitat	Fish accessible wetlands in valley. Approximately 30% of the reach has habitat for breeding and/ or rearing, and 54% of reach has habitat for breeding/ rearing/ wintering use by multiple PHS or SC. (Ref# 24,92,93,105)
	TSE species	Bull trout (FT), Chinook (FT & SC), Coho (FCo), and Cutthroat (FCo). (Ref# 92,93,105)
	Invasive wildlife/fish species	Warm water fishes in Sunset Pond: largemouth bass, yellow perch, bluegill, brown bullhead, yellow bullhead. (Ref# 60)
Physical Environment	Acres of land in reach	114.6 acres total with 94.6 acres of land and 20.0 acres of water (Ref# 13)
	Aquatic vegetation	No data
	Slope	Majority of reach is flat, in an outwash valley, slope class 2-5%. A ridge is located along the outer extent of the SMA, slope classes 20-35% and 35-50%. A berm is located on the south side of Bug Lake – probably fill from excavation of the lake. I-5 creates an artificial berm across the reach. The berm is broken by one bridge. (Ref# 21)
	Buildings	19 covering 0.96 acres total (Ref# 16)
	Culverts/stormwater utilities	Two detention facilities (0.26 ac). Four culverts or tunnels for a length of 137 feet. These structures are under I-5 and James Street. Sewer mains located near Sunset pond, James Street. Stormwater drains around Sunset pond and south of James Street. No stormwater discharge points are indicated, however based on existing drain lines, 9 discharges are possible. (Ref# 39,40,41,42)
	Geology	Majority of valley is continental glacial outwash and some glaciomarine drift on the outer edges of the SMA. Seismic Hazard Areas (geologic units) and Landslide Hazard Areas on 15-35% or greater slopes. (Ref# 21,103)
	Tributary creeks	Tributaries W and V along Rail Road grade north of creek (Ref# 8,57,59,71)
	Wetlands	(Ref# 11,52)
	Impervious surface	75% pervious, 13% semi-pervious, 11% impervious. (Ref# 12)
	Invasive plant species	Tansy ragwort, yellow flag iris, reed canary grass, blackberry, hairy willow herb, knotweed, meadow knapweed. (Ref# 100)
	Roads/transportation	Reach bisected by I-5. Birchwood Avenue lower terminus of reach. Old railroad grade affects hydrology in reach, particularly east of I-5. Total of 1.2 miles or 4.3 acres of roads. (Ref# 14,35,36,44,45,46)
	Soils	The northern portion of the reach has hydric soils, very low filtration/higher runoff potential (Hydrologic soil Group D). The very southern portion of the reach has high filtration/low runoff soils (Group A). (Ref# 51,63)
	Topography	99' to 181' range; 112' mean. (Ref# 47)

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	FEMA	71.2 acres in 100 year floodplain, 22.1 acres in the floodway. (Ref# 19)
	Terrestrial Vegetation	Deciduous forest dominates the reach. Approximately 83% of reach has a diverse multi-structured native habitat that is a high quality forest with a mature component and emerging young trees. (Ref# 8,20,71)
Riparian Function	DOE 303(d)	Up to Sunset Pond only: Category 5 Polluted Water listed for fecal coliform, temperature, dissolved oxygen, zinc and pentachlorophenol; and Category 2 Water of Concern listed for pH and temperature. Bug Lake and Sunset Pond do not have any listings associated with them. (Ref# 83,89)
	Channel confinement	Unconfined (Ref# 22,23)
	Channel gradient	<1% (Ref# 22,23)
	Channel migration zone	Channel migration limited in this reach, although possible in both the upper and lower most portions of the reach. The creek flows through Sunset Pond and Bug Lake in this reach. (Ref# 22,23,94)
	Creosote structures	No data
	Fish passage blockages	None are listed. However, culverts under Birchwood Avenue are impassible during low flows – flow becomes subsurface, culverts under I-5 impassible during mid to higher flows due to high velocity, outlet of Sunset Pond during low flows – flow becomes subsurface. (Ref# 15,94)
	In-water structures	Culverts/tunnels as listed above (Ref# 8,18,43,71)
	LWD presence	Incomplete data
	Non-point source pollution	No data
	Point source pollution	No data
	Riffle/pool analysis	No data
	Aquatic substrate type	No data
	Toxic sites/land fills	None indicated (Ref# 80)
Historic & Cultural	Historic aerials	No data
	Archeological sites	No data
	Historic sites	None indicated (Ref# 77)
	Parks & public access	0.3 acres of open space. Bug Lake and Sunset Pond are owned by the city. Large parcel north of commercial area between James and I-5 also owned by the city. (Ref# 33,34,36,48,54)
Function Analysis	<p>Reach Function</p> <ul style="list-style-type: none"> Hydrologic Shoreline Vegetation Habitat <p>Limiting Factors</p> <p>Functions</p> <ul style="list-style-type: none"> Sustainable Not Sustainable <p>Priority Actions</p>	<p>Impaired. Hydrology is flashy, man-made ponds, creek channelization; loss of floodplain.</p> <p>Functioning. Improvements may increase function.</p> <p>Terrestrial: functioning.</p> <p>Stream: impaired. Man-made ponds</p> <ul style="list-style-type: none"> Existing infrastructure – Interstate-5, culverts (during low and high flows) Zoning Water quality <p>All three functions sustainable with improvements.</p> <p>Hydrology sustainable at current levels but could be improved.</p> <ul style="list-style-type: none"> Creek diversion out of ponds Fish passage improvements at Birchwood Ave, Interstate-5 and Sunset Pond

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**Current Enhancement
Projects**

**Preservation/Enhancement
Opportunities**

- Floodplain protection against development
 - Water quality improvement
- Public purchase of undeveloped property

- Stormwater treatment and detention
- Possible: in-stream structures

(Ref# 4,24,61,62,69,70,71,75,89 for above)