

### 3.13 VASHON AND MAURY ISLANDS SUBBASIN

---

Physical description.....	2
Stream Course and Morphology.....	2
Salmonid Use.....	5
Factors of Decline.....	5
Land Use.....	5
hydrology.....	6
Water Quality.....	7
Non-Native Species.....	7
Key Findings and Identified Habitat-Limiting Factors.....	7
Data Gaps.....	8
Early Action Recommendations.....	8
Individual Freshwater Streams.....	8
Mccloud Creek (1).....	8
Sylvan Beach Creek (2).....	9
Water Wheel Creek (7).....	10
McCormick Creek (10).....	10
Baldwin Creek (11).....	11
Shinglemill Creek and Its Tributaries (12).....	12
Unnamed Stream (13).....	13
Ober Creek (15).....	14
Skeeder Creek (16).....	14
Cove Creek (17).....	15
Leo's Creek (19).....	16
Robinwood Creek (20).....	17
Green valley Creek (21).....	18
Christianson (Jod) creek (23).....	19
Unnamed Stream (24).....	20
Unnamed Stream (26).....	21
Unnamed Tributaries (27, 28 and 29).....	22
Bates Creek (30) (h2).....	22
Sealth Creek (32).....	23
S-1 and s-2 Creeks (33 and 35).....	24
Spring beach Creek (34).....	25
Slaughters Creek (36).....	25
Tahlequah Creek (37).....	26
Shawnee Creek (40).....	27
Fisher Creek (41).....	28
Judd Creek (42).....	29
Tsugwalla Creek (43).....	29
Raab's Lagoon Creek (44).....	30
Mileta Creek (45).....	31
Ellis Creek (62).....	32
Ellisport Creek (63).....	33
Beall Creek (64).....	34
Gorsuch Creek (65).....	35
Dillworth Creek (66).....	36
Glen Acres Creek.....	37

### 3.13 VASHON AND MAURY ISLANDS SUBBASIN

---

#### PHYSICAL DESCRIPTION

##### **STREAM COURSE AND MORPHOLOGY**

The larger of the streams in terms of stream length, flow and drainage basin, on Vashon and Maury Islands (the Island) typically originate from small, diverse series of groundwater seeps in the upland areas of the Island. In these reaches, the streams are generally low gradient and meander across the landscape. These upland areas are usually between 300 to 500 feet above sea level. The larger stream systems (such as Judd and Shinglemill Creeks) flow through an extensive system of long, high-gradient ravines before entering the Puget Sound estuary. The streams that have smaller drainage areas and lower flows may also originate from upland seeps and/or seeps and springs present inside of the steep incised ravines that drop through the bluffline that rings the Island. All of these streams drop through steep (gradients of 10-15 percent) stream channels before they enter the Puget Sound estuary with little or no freshwater to saltwater interface.

For many of the streams on the Island, basic habitat quality data has not been collected. Much of the data and information in this chapter was collected by survey crews from Washington Trout (In Progress) from surveys conducted during the summer of 2000. Most of their data is qualitative and was subject to the best professional judgement of the survey crews involved in the collection. Unless otherwise noted, the information below is attributed to Washington Trout (In Progress).

Williams identified only a few of the Island streams, and Ames (1981) identified 28 streams with 18 tributaries on Vashon Island and 11 tributaries with 4 tributaries on Maury Island. Because many of the creeks were not identified by these sources, a numbering system devised by Washington Trout is utilized here. That system begins at the north end of Vashon Island with the number "1" and assigns individual independent creeks a successively higher number as one moves counter-clockwise around the Island. Where known, WRIA numbers from Williams (1975) and Ames (1981) are included in parentheses in table Vashon-1. Stream numbers and local names, where known, are shown in the table Vashon-1 and on the Fish Distribution Maps located in the Report Appendix.

Table Vashon-1. Vashon-Maury Island Streams, Fish Presence, Barriers and Water Withdrawals.					
Stream Number	Name	Species of Fish Present	Barrier Present	Water Withdrawals	Comments
1	McCloud Ck.	None	Yes–mouth	Yes - Private	
2	Sylvan Ck.	None	Yes–mouth	Yes- Private	
3	Corbin Beach Ck.	None	No data		
4	Unnamed	None	No data		
5	Unnamed	None	No data		
6	Unnamed	None	No data		
7	Water Wheel Ck.	None, but possibly historic	Yes–bulkhead at mouth & diversion	Yes--Private	Mouth altered by water wheel diversion
8	Unnamed	None	No data		
9	Cedarhurst Landing Ck.	None	No data		
10	McCormick Ck.	Cutthroat – juv.	Yes–Burma Dr	Historic	Old diversion structure may be barrier.
11	Baldwin Ck.	Cutthroat – juv. Coho – juv.	Yes – Cedarhurst Rd.	Yes--Private	
12 (0159) 12 –A 12 – C 12 – D 12 – E	Shinglemill Ck Needle Ck J + Y Creek Pit Bull Ck. Unnamed	Cutthroat–juv. & adult. <i>O. mykiss</i> – juv. & adult Coho - adult Coho – juv. & adults Cutthroat – juv. Cutthroat – juv. Cutthroat – juv. Cutthroat – juv.	Yes Yes–constructed Falls Yes – natural falls	Yes – Westside Water District Historic Yes - private Historic	Some mass wasting sites in ravines. Headwater diversion, possible origin of mass wasting
13	Unnamed	None	Yes–bulkhead	None identified	
14	Unnamed	None	No data	No data	
15 (0158)	Ober Ck.	Possible cutthroat	Yes – Ober Drive	None identified	Dredged every 10+/- years by homeowners
16 (0157)	Skeeder Ck.	None	Possible - bulkhead	Yes-- multiple private	
17	Cove Ck.	None	None identified	Historic	
18	Unnamed	None	None identified	Nodata	
19	Leo's Ck.	None	Possible – debris barrier at mouth	Yes--Multiple private	
20 (0155)	Robinwood Ck.	Cutthroat juvenile	None identified	None identified	County landfill in basin
21 (0154)	Green Valley Ck.	None	Yes – Dam near mouth	Historic	Old water wheel
22	Unnamed	None	No data	No data	
23 (0153)	Christianson (Jod) Ck.	Cutthroat – juv <i>O. mykiss</i> – juv.	Yes – Redding Beach Rd.	Yes – Multiple private systems	
24	Unnamed	None	Possible at mouth. Yes–Redding Rd. culvert	None identified	Hand dug water diversion near mouth
25	Unnamed	None	No data	No data	
26	Unnamed	None	Possible at mouth	None identified	
27	Unnamed	None	Yes–bulkhead	None identified	
28	Unnamed	None	Yes–bulkhead	None identified	
29	Unnamed	None	Yes–bulkhead	None identified	
30 (0152)	Bates Ck.	Cutthroat juvenile	Probable–culverts	None identified	
31	Paradise Cove Ck.	None	No data		
32 (149)	Sealth Ck.	None	Yes–bulkhead	None identified	
33	S 1 Ck.	None	Sand and debris bar at mouth	None identified	

34	Spring Beach Ck.	None	Yes—culvert and bulkhead at mouth	None identified	
35	S 2 Ck.	None	Sand and debris bar at mouth	None identified	
36	Slaughters Ck.	None	Yes-pipe at Pohl Rd. & ponds.	None identified	Impacted by ponds at mouth.
37 (0147)	Tahlequah Ck.	Cutthroat Juvenile	Yes on tributary "B"	None identified	½ to ¾ - acre pond with standpipe outlet
38	Chen Ck.	None	No data	No data	
39	Lost Lake Ck.	None	No data	No data	
40	Shawnee Ck.	Cutthroat Juvenile	Yes—bulkhead and pipes	None identified	
41 (0139)	Fisher Ck.	Cutthroat juvenile	Possible culvert barrier at 232 <sup>nd</sup> St.	Yes	Burton Water Co. present in upper reaches
42 (0129)	Judd Ck.	Chinook, Coho & chum—adults Cutthroat – juv.	Needs to be surveyed.	Needs to be surveyed	Not surveyed by Washington Trout
43 (0126)	Tsugwalla Ck.	None	Yes – mouth and culvert	None identified	Stream flows thru 3 ponds
44	Raab's Lagoon Ck.	None	Possible at bulkhead	None identified	
45	Mileta Ck.	Cutthroat – juv.	Yes-culvert	None identified	
46	N. Dockton Ck	None	No data	No data	
47	Mid Dockton Ck.	None	No data	No data	
48	S. Dockton Ck.	None	No data	No data	
49	Unnamed	None	No data	No data	
50	Unnamed	None	No data	No data	
51	Unnamed	None	No data	No data	
52	Unnamed	None	No data	No data	
53	Unnamed	None	No data	No data	
54	Unnamed	None	No data	No data	
55	Unnamed	None	No data	No data	
56	Unnamed	None	No data	No data	
57	Maury Island Park Ck.	None	No data	No data	
58	Unnamed	None	No data	No data	
59	Unnamed	None	No data	No data	
60	Unnamed	None	No data	No data	
61	Unnamed	None	No data	No data	
62	Ellis (Tramp Harbor) Ck.	Cutthroat Juvenile	Yes - Culvert & dam	Yes – Municipal District 19	Water diversions into ponds
63	Ellisport (Fuller) Ck.	Cutthroat Juvenile	Partial barrier	None identified	Soil contamination at mouth
64	Beal Ck.	Cutthroat juvenile	Yes – Water Station	Yes – Municipal District 19	
65	Gorsuch Ck.	Cutthroat Juvenile	Yes – several natural and anthropogenic	None identified	Sewage treatment plant
66	Dillworth Ck.	Cutthroat juvenile	Yes -Dillworth Road	None identified	
67	Glen Acres Ck.	None	Yes - bulkhead	None identified	
68	Unnamed	No data	No data	No data	
69	Unnamed	No data	No data	No data	
70	Unnamed	No data	No data	No data	
72	Unnamed	No data	No data	No data	
73	Unnamed	No data	No data	No data	
74	Unnamed	No data	No data	No data	

## **SALMONID USE**

The known freshwater distribution of anadromous salmonids for Vashon and Maury Islands is depicted in the Fish Distribution Maps located in the Report Appendix. Known distribution was obtained from the Washington Department of Fish and Wildlife Spawning Ground Survey Database, StreamNet, SASSI, and the year 2000 survey conducted by Washington Trout.

Many of the cutthroat observations are of juveniles. Coastal cutthroat trout are a subspecies of cutthroat trout (*O. clarkii*) and are thought to have four life history forms. Since it is possible for all forms to occur in a stream at once and since it is not possible to distinguish between resident and anadromous forms, we have chosen to use the term coastal cutthroat in this document.

*O. mykiss* has both resident (rainbow trout) and anadromous (steelhead) life history forms. Juvenile observations of *O. mykiss* face similar challenges to that of coastal cutthroat. Rather than make attempts to distinguish between the two forms we have chosen to use the term *O. mykiss* in this document.

In many cases, the documented observations of salmonids (resident and anadromous) likely underestimates the actual distribution. This is particularly true of coastal cutthroat trout and coho.

A map illustrating the presumed freshwater distribution of salmonids (but not coastal cutthroat) is depicted in the Fish Distribution Maps located in the Report Appendix.

All of these creeks flow directly into Puget Sound and as such are believed to provide an important localized freshwater input into this area of Puget Sound. No data are available detailing the complete utilization by juvenile, sub-adult or adult salmonid usage of these marine areas. However juvenile and adult coho, chinook, and coastal cutthroat trout have been observed at numerous points along the marine shorelines (Kerwin 2000).

## **FACTORS OF DECLINE**

### **LAND USE**

Vashon and Maury Islands have experienced significant and substantial changes since historic times (prior to 1860). Virtually all of the original pre-settlement wetland forests of Sitka spruce and western red cedar, and upland forests of western hemlock and Douglas fir within the subbasin were logged and removed by 1897 (USGS 1900). In many cases, the forests have been logged a second time and then the land cleared.

Currently, land use throughout the Island is typically a mixed rural residential, small scale agriculture and service related commercial development. The development of residential and commercial areas has resulted in the alteration of the natural drainage patterns, but no data was located that provided an indication of total or effective impervious surfaces in any of the Island's stream subbasins.

## HYDROLOGY

Hydrology in many of these basins has exhibited changes due to development of upland areas and water withdrawals for domestic and agricultural use by private landowners and water districts. Known flows of selected creeks is shown in table Vashon-2

<b>Stream Name</b>	<b>Flow (cfs) Low</b>	<b>Flow (cfs) High</b>	<b>Base Flow (cfs)</b>
Beall Creek (64)	0.01	4.28	0.3-1.0
Mileta Creek (45)	0	91	0.0-2.0
Fisher Creek (41)	0.6	ND	1.0
Green Valley Creek (21)	0.44	ND	0.44
Paradise Cove Creek <sup>1</sup> (31)	0.12	0.45	1.
Tahlequah Creek (37)	0.3	ND	0.5
Judd Creek (42)	2.25	ND	2.0
Upper Judd Creek (42)	1.5	ND	1.5-2.0
Needle (Shinglemill) Creek (12A)	1.4	ND	1.5-2.5

ND = Not Determined. The data obtained exceeded the range of the discharge rating curve.  
 1. Flows may not be accurate due to data collection limitations. (King County, 1998)

Selected streams in WRIA 15, and specifically on Vashon Island, were closed to water withdrawal by the Washington Department of Ecology in 1988. These streams were closed in as a part of an Instream Resources Protection Program (IRPP) under the authority of Chapter 173-515 WAC. The streams closed are the mainstem reaches of Judd, Fisher and Christianson (Jod) Creeks and Shinglemill Creek and all of its tributaries. No minimum instream flows have been established for streams on the Island.

A survey that compared permitted water withdrawal quantities with actual water withdrawal quantities of the six (Burton Water Company, Dockton Water Association, Heights Water Association, MMC, Water District No. 19 and the Westside Water Association) water purveyors indicated two (Heights Water Association and Water District Number 19) exceeded maximum permitted quantities for instantaneous water withdrawal (Seattle King County Health Department 1995). In that same survey, three (Dockton Water Association, Heights Water Association, and Water District No. 19) of four (Dockton Water Association, Heights Water Association, MMC, and Water District No. 19) water purveyors exceeded the permitted maximum annual water withdrawal quantities.

The exact number of private surface water withdrawals and wells on the Island is not known. A search of 243 water rights, as listed in the WSDOE Water Rights Application Tracking System, showed 178 to be surface water, 56 groundwater and 9 unknown water withdrawals. While there are procedures for private wells to be tagged and entered into the South King County Health Department database, many of the older wells and surface water withdrawals do not appear in that database.

## WATER QUALITY

Surface water quality sampling occurred at eight stream stations on Vashon Island on approximately 14 occasions (monthly) between August 1991 and September 1992 as part of the Vashon-Maury Island Groundwater Management Plan (1998) effort. The eight streams and their watershed areas are given in table Vashon-3. Freshwater samples were collected near the staff gauge in the middle of the creek near the mouth. Samples were analyzed for temperature, pH, coliforms (fecal, total), metals, chloride, nitrate-N, and sulfate. In addition, the Judd Creek site was sampled for volatile organic compounds, pesticides, and PCBs in August and September 1991. Results are presented in this section for temperature, pH, metals, and organics for purposes of assessing potential factors of decline for salmonids.

<b>Stream (Station Name)</b>	<b>Drainage Area (Acres)</b>
Beall Creek	211
Fisher Creek	1,549
Green Valley Creek	762
Judd Creek	3,149
Mileta Creek	700
Paradise Cove Creek	200
Shinglemill (Needle) Creek	1,996
Tahlequah Creek	780

A summary of the water quality testing results in this survey indicates that most metals were below standards on most occasions. Cadmium, copper and zinc exceeded acute standards on one occasion at between one and four locations. With the exception of lead, the mean values of all metals were below chronic levels at all stations. Elevated lead levels (above the chronic standard) occurred on several occasions at Beall, Fisher and Mileta creeks.

Water was sampled at the Judd Creek site and analyzed for volatile organic compounds, pesticides, and PCBs in August and September 1991. All parameters were below detectable levels on both occasions.

## NON-NATIVE SPECIES

There are numerous non-native plant species throughout these subbasins, but none appear to be a fundamental habitat-limiting factor to natural salmonid production at this time.

## KEY FINDINGS AND IDENTIFIED HABITAT-LIMITING FACTORS

- Surface water is used for domestic purposes and demand is highest when instream flows are lowest.
- There are numerous anthropogenic barriers to anadromous fish migration on streams within this subbasin.
- Mass wasting and streambed scour may be limiting natural production of salmonids in Shinglemill Creek.

## DATA GAPS

- There are no dissolved oxygen, turbidity or total suspended solids data for Island streams. There is no continuous temperature data, so it was not possible to determine maximum water temperatures. Available metals data is only for total metals; therefore, it was not possible to make comparisons with dissolved metal standards. There are no data available for storm conditions.
- There has not been a comprehensive barrier assessment conducted.
- There is not a comprehensive base line habitat survey for all Island streams.
- The loss of stream channel due to channelization has not been quantified.
- Actual, instantaneous water use from subbasin streams is not known.
- A water use and water level monitoring program should be established.
- Minimum instream flows are not identified on Island streams where private and municipal water withdrawals occur.
- 

## EARLY ACTION RECOMMENDATIONS

- Conduct a detailed assessment of the existing stream habitat conditions for use in evaluating enhancement opportunities and constraints.
- Conduct a comprehensive fish barrier and habitat assessment project to identify access barriers and the quantity and quality of habitat upstream throughout Vashon-Maury Islands.
- Screen all water diversions properly to avoid fish entry.
- Conduct an island wide investigation of (legal and illegal) surface and ground water withdrawal. As a part of this investigation examine the impacts of surface and groundwater withdrawals on stream subbasins and evaluate the effects on salmonids.

## INDIVIDUAL FRESHWATER STREAMS

Varying amounts of information and data are available on the different freshwater stream systems of the Island. Information obtained on 38 of them is presented below.

### **MCCLLOUD CREEK (1)**

#### FISH PASSAGE

The creek enters the Puget Sound estuary via a 5-foot-high drop from a boxed wooden pipe that is a barrier. This structure eliminates anadromous fish access.

#### LAND USE

Land use is a mixture of forest and rural residential.



## RIPARIAN CONDITION

Deciduous trees dominate the riparian habitat of this small stream along with grasses and brush such as salmonberry, Himalayan blackberry and thimbleberry. Very few coniferous trees are present. Stream channel complexity is provided by abundant amounts of tree limbs and brush with lesser amounts of logs. Approximately 60 percent of the stream is in a shaded condition.

## SEDIMENT CONDITION

The pool-to-riffle ratio is approximately 30:70. Overall, substrate types include gravel (20 percent), sand (60 percent), and mud (20 percent).

## HYDROLOGY

No information was located on stream hydrology. There is a private well house on the mainstem.

## HYDROMODIFICATION

The obvious hydromodification is the boxed wooden pipe where the creek enters saltwater. A footpath along the left bank locally limits lateral stream migration.

## **SYLVAN BEACH CREEK (2)**

### FISH PASSAGE

The creek enters the Puget Sound estuary via a 4-foot high drop through a bulkhead. This drop is a complete barrier and eliminates anadromous fish access.

### LAND USE

Land use is a mixture of forest and rural residential.

## RIPARIAN CONDITION

Only limited information was available about current riparian conditions of this small creek. Trees were described as sparse, shrubs and grasses as moderate. The percentage of the stream afforded shading is approximately 50 percent. Instream structure of any type was described as sparse and solely from deciduous trees.

## SEDIMENT CONDITION

The pool-to-riffle ratio is approximately 20:80. Substrate types include gravel (50 percent) and sand (50 percent).

## HYDROLOGY

No information was located on stream hydrology. A private water tank is located over a spring on the mainstem.

## **WATER WHEEL CREEK (7)**

### **FISH PASSAGE**

The creek enters the Puget Sound estuary via a 5-foot high drop from a bulkhead. This bulkhead is a barrier that eliminates anadromous fish access. Further upstream, a 2-foot-high diversion dam funnels the stream flow through a water wheel and this is a probable barrier at some flows.

### **LAND USE**

Land use is a mixture of forest and rural residential.

### **RIPARIAN CONDITION**

In the lower 300 feet, English ivy dominates the stream-associated riparian habitat. Upstream of this point, the stream enters a steep, incised ravine where second-growth deciduous and coniferous trees are present. Instream channel complexity is provided by moderate amounts of logs, rootwads, tree limbs and brush. Approximately 10 percent of the stream is in a shaded condition.

### **SEDIMENT CONDITION**

The pool-to-riffle ratio is approximately 10:90. Substrate types include gravel (50 percent) and sand (50 percent). Some natural erosion is occurring at points approximately 800 feet upstream of the creek mouth where a diverse series of small seeps are eroding unconsolidated soils.

### **HYDROLOGY**

No information was located on stream hydrology. There are two water tanks that sit on springs about 300 feet upstream of the creek mouth.

## **MCCORMICK CREEK (10)**

### **FISH PASSAGE**

A culvert underneath Burma Drive that is perched approximately 2 feet high at its downstream end is believed to be a barrier to upstream fish migration. Approximately 80 feet upstream of Burma Drive there is a water diversion structure that is also believed to be a barrier. Finally, further upstream approximately 220 feet is a 4-foot-high drop from a natural logjam that is also believed to be a barrier to upstream fish migration.

### **LAND USE**

Land use is a mixture of forest and rural residential.

## RIPARIAN CONDITION

No quantitative data was available to indicate riparian conditions of this system. Deciduous trees dominate the riparian habitat with moderate numbers of conifers. Stream channel complexity is provided by moderate amounts of structure such as logs, rootwads, limbs and brush. Approximately 60 percent of the stream is in a shaded condition.

## SEDIMENT CONDITION

The pool-to-riffle ratio is approximately 40:60. Substrate types include boulder (5 percent), cobble (15 percent), gravel (30 percent), sand (40 percent), and mud (10 percent).

## HYDROLOGY

No information was located on stream hydrology. A capped well and water system are located on the mainstem creek. There is an abandoned private potable water supply system on this creek.

## BALDWIN CREEK (11)

**NOTE:** The WDNR hydrolayer currently has this stream mapped as a tributary to Shinglemill Creek. That is incorrect. The creek enters the Puget Sound estuary directly, albeit via the alluvial fan of Shinglemill Creek.

## FISH PASSAGE

Coho salmon juveniles and coastal cutthroat trout juveniles have been observed in this creek. A 2-foot-high perched culvert and associated concrete energy dispersion apron at Cedarhurst Drive is believed to be a barrier to upstream salmonid migration.

## LAND USE

Land use is a mixture of forest and rural residential.

## RIPARIAN CONDITION

The riparian habitat has approximately equal amounts of coniferous and deciduous trees along with an understory of brush such as salmonberry, Himalayan blackberry, salal and stinging nettle. Stream channel complexity is provided by abundant amounts of tree limbs, rootwads, logs and brush. Approximately 80 percent of the stream is in a shaded condition.

## SEDIMENT CONDITION

the pool-to-riffle ratio is approximately 40:60. substrate types include cobble (10 percent), gravel (40 percent), sand (40 percent), and mud (10 percent).

## HYDROLOGY

No information was located on stream hydrology. There is a private well house on the mainstem.

## SHINGLEMILL CREEK AND ITS TRIBUTARIES (12)

### FISH PASSAGE

This stream system is the second-largest subbasin on the Island with a drainage area of 1,966 acres and is utilized by chum and coho salmon, along with steelhead and coastal cutthroat trout. No anthropogenic barriers are reported in this stream system. However, Munday (1999) reported that culverts on several tributaries were blockages. However, Washington Trout (In Progress) did not report similar observations.

### LAND USE

Land use is a mixture of forest, agriculture and rural residential.

### RIPARIAN CONDITION

Riparian habitats vary from older second-growth coniferous and deciduous forests to grasslands where stock grazing occurs and animals have access to the creek. Some logging activity occurs on larger interior parcels that is believed to impact the creek. Of the stream reaches examined by Washington Trout survey crews in 2000, approximately 70 percent were shaded.

### SEDIMENT CONDITION

Table Vashon-4 shows substrate types in Shinglemill Creek and selected tributaries

<b>Stream Name</b>	<b>Boulder %</b>	<b>Cobble %</b>	<b>Gravel %</b>	<b>Sand %</b>	<b>Mud %</b>	<b>Bedrock %</b>
Shinglemill Ck.	10	20	30	30	5	5
Needle Ck.	0	20	50	20	5	5
J & Y Creek	0	10	50	30	0	10
Pit Bull Creek	5	10	50	20	10	5
Unnamed trib.	0	20	50	20	5	5

Source: Washington Trout (In Progress).

Table Vashon-5 illustrates approximate overall pool-to-riffle ratios within the Shinglemill Creek subbasin.

<b>Stream Name</b>	<b>Pool-to-Riffle Ratio</b>
Shinglemill Creek	50:50
Needle Creek	30:70
J & Y Creek	40:60
Pit Bull Creek	30:70
Unnamed trib	30:70

Stream channel bed load and scour was identified as a problem during coho egg incubation periods (Vashon-Maury Island Land Trust 1999). Bed scour of up to 8.75 inches and redeposited sediments of up to 6 inches occurred at some locations in Shinglemill Creek. This data is from only one season sampling effort but is indicative of adverse egg incubation or fry emergent success.

## HYDROLOGY

A flow survey was conducted during the 1998/99 winter. Flow discharge rates remained at 5 cfs or less from early August through mid-November. The highest flows measured were in late November 1998 and January 1999 at 37 cfs and 39 cfs respectively. A more typical seasonal flow during winter months was approximately 10 cfs (Vashon-Maury Island Land Trust 1999).

There are municipal water system wells (Westside Water District) on the mainstem Shinglemill Creek, and historic private water supply systems on Pit Bull Creek and the unnamed tributary.

## UNNAMED STREAM (13)

### FISH PASSAGE

The creek enters the Puget Sound estuary through a bulkhead that is perched 3 feet above the beach, eliminating access to anadromous salmonids. The creek moves upstream from this point through a culvert approximately 200 feet long underneath two private driveways. Between the two driveways is a perched culvert that is approximately 3-feet high.

### LAND USE

Land use within this subbasin is a mixture of forest and rural residential.

### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. Coniferous and deciduous trees are sparse in the lower reaches of the stream and abundant in the upper reaches. Instream structure is dominated by brush with logs and rootwads sparse. Approximately 50 percent of the stream exists in a shaded condition.

### SEDIMENT CONDITION

Overall,, the substrate condition of this unnamed stream was characterized as 50 percent gravel, 30 percent sand, and 20 percent mud. Pool-to-riffle ratios are reported as 20:80.

## HYDROLOGY

No information was located that provided any insight into stream flow of this creek.

## HYDROMODIFICATION

The lower reaches of the creek are contained within a culvert, and the stream is channelized along an access road for more than of 300 feet. The creek crosses under Cedarhurst Drive through a county culvert.

## **OBER CREEK (15)**

### **FISH PASSAGE**

Ober Creek enters the Puget Sound estuary via a ditched channel. Potential barriers exist at two culverts that are perched (12 and 18 inches) where the creek crosses underneath of Ober Drive. Salmonids have been observed downstream of the lower perched culvert, but no fish have been sighted upstream

### **LAND USE**

Land use within this subbasin is a mixture of forest and rural residential. The mouth of creek is in the vicinity of single-family residences.

### **RIPARIAN CONDITION**

The riparian condition is mix of second-growth deciduous and coniferous forest along with a brush understory. Instream structure is sparse in all aspects. Approximately 40 percent of the stream exists in a shaded condition.

### **SEDIMENT CONDITION**

Overall, the substrate condition of Ober Creek was characterized as 10 percent cobble, 50 percent gravel, 20 percent sand, and 20 percent mud. Pool-to-riffle ratios are reported as 30:70.

### **HYDROLOGY**

No data was located that indicated changes in stream flows.

### **HYDROMODIFICATION**

Hydromodification occurs primarily in the reach from downstream of Ober Road to the point where the stream enters the Puget Sound estuary. Local residents remove stream sediments at approximately 10-year intervals to prevent flooding and septic system damage. Depending on the type of sediment removed, this could represent an adverse impact to spawning gravel quantity and quality as well as increase upstream and downstream scour of spawning areas.

## **SKEEDER CREEK (16)**

### **FISH PASSAGE**

There is a possible barrier to anadromous or resident salmonids where the creek enters the Puget Sound estuary through a perched bulkhead.

#### LAND USE

Land use within this subbasin is a mixture of forest and rural residential. The mouth of has numerous single-family residences

#### RIPARIAN CONDITION

The riparian condition is a mix of second-growth deciduous and coniferous forest with an understory of brush. Numerous second-growth cedars are present in the ravine. Instream structure is provided by abundant amounts of logs, rootwads, limbs and brush. Approximately 80 percent of the stream exists in a shaded condition.

#### SEDIMENT CONDITION

Overall, the substrate condition of Skeeder Creek was characterized as 10 percent boulder, 20 percent cobble, 30 percent gravel, 20 percent sand, 10 percent mud, and 5 percent bedrock. Clay banks and associated seeps on a small tributary stream located in the steep ravine reach provide fine materials to downstream reaches. Pool-to-riffle ratios are reported as 40:60.

#### HYDROLOGY

No data was located that indicated changes in stream flows. At least two private water supply systems that withdraw water are operating in this system.

#### HYDROMODIFICATION

No data was located that indicated hydromodification other than the water supply systems noted immediately above.

### **Cove Creek (17)**

#### FISH PASSAGE

There are no known barriers to anadromous or resident salmonids on the mainstem Cove Creek. A culvert located at the mouth of the creek is not believed to be a barrier. No salmonids were found during the year 2000 survey.

#### LAND USE

Land use within this subbasin is a mixture of forest, agriculture and rural residential.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest, agriculture (pasture), public park (Beulah Park), and rural residential. In the lower stream reach (75 feet) in the vicinity of the power transfer station, most of the riparian habitat has been removed. Upstream of that location the stream enters a second-growth deciduous and coniferous forest with Himalayan blackberries adjacent to the stream. Stream channel complexity is provided by abundant amounts of brush, while only moderate amounts of logs, rootwads and tree limbs are present. Approximately 60 percent of the stream exists in a shaded condition.

## SEDIMENT CONDITION

Overall, the substrate condition of Cove Creek was characterized as 10 percent cobble, 65 percent gravel, 10 percent sand, and 10 percent mud. A natural waterfall and associated bedrock chute is causing some localized stream erosion problems in the most downstream. Stream channel gradients as high as 30 percent are noted in the steeper reaches. Pool-to-riffle ratios are reported as 1:1.

## HYDROLOGY

No data was located that indicated changes in stream flows.

The water in the mainstem Cove Creek between tributaries A and B had a brownish color during the 2000 surveys. The origin of this color was unknown. A satellite sewage treatment plant is scheduled for construction in this reach to address failing septic systems that may be the origin of the water color here.

## HYDROMODIFICATION

Hydromodification occurs at points where the creek crosses private and county roads. Old private water supply systems in the upper reaches of the stream appear to be abandoned.

## LEO'S CREEK (19)

### FISH PASSAGE

A debris jam at the mouth of Leo's Creek may be a barrier to upstream migration of salmonids. No salmonids were found during surveys conducted in year 2000. Diversion of water by private water supply systems may reduce instream flows and limit natural production of salmonids. On tributary "B," the stream channel crosses a field with an access road. The culvert under this access road has headcut and undermined the culvert creating a 15-foot drop that would be a barrier to fish migration. Anecdotal information by local long-term residents indicates that salmonids were historically present in this stream.

### LAND USE



Land use within this subbasin is a mixture of forest, agriculture and rural residential.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest, pastureland and rural residential. Instream channel complexity is provided by abundant amounts of brush and tree limbs while moderate amounts of logs and rootwads are present. Approximately 80 percent of the stream exists in a shaded condition.

#### SEDIMENT CONDITION

Overall, the substrate condition of Leo's Creek is characterized as 20 percent cobble, 40 percent gravel, 20 percent sand, and 20 percent mud. A possible source of bedload is associated with the undercut culvert in tributary B. Pool-to-riffle ratios are reported as 30:70.

#### HYDROLOGY

No data was located that indicated changes in stream flows. A constructed pond forms the headwaters of tributary B, and there are some constructed ponds in the lower reaches of the mainstem creek.

#### HYDROMODIFICATION

Hydromodification occurs primarily in the reach from Tahlequah Road downstream to the where the stream enters the Puget Sound estuary. Water withdrawal occurs from the private water supply systems near the stream's headwaters.

### **ROBINWOOD CREEK (20)**

#### FISH PASSAGE

There are no known barriers to anadromous or resident salmonids on the mainstem Robinwood Creek. Coastal cutthroat trout were observed in this creek.

#### LAND USE

The principal land use within this subbasin is characterized as rural residential.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth coniferous and small deciduous trees. Streamside associated cover is provided by second-growth coniferous and deciduous trees and brush. Instream channel complexity is provided by abundant amounts of log, rootwads, limbs and brush. Approximately 80 percent of the stream exists in a shaded condition.

#### SEDIMENT CONDITION

Overall, the substrate condition of Robinwood Creek was characterized as 10 percent cobble, 50 percent gravel, 20 percent sand, 15 percent mud, and 5 percent bedrock. Pool-to-riffle ratios are reported as 1:1.

## HYDROLOGY

No data was located that indicated changes in stream flows. A county landfill exists in this drainage basin, and there are some water quality monitoring wells associated with this landfill. These wells are located uphill from the tributary B headwater springs.

## HYDROMODIFICATION

Hydromodification occurs at locations where the stream crosses private and county roads (i.e., Sunset Beach Drive).

## **GREEN VALLEY CREEK (21)**

### FISH PASSAGE

Green Valley Creek drains an area of 762 acres on the western side of Vashon Island. Approximately 150 feet upstream from the mouth of the creek is a 3-foot-high diversion dam associated with a small water wheel. There was no plunge pool on the downstream side of the diversion dam and this is believed to be a complete barrier to salmonid migration. No salmonids were observed during the year 2000 survey.

### LAND USE

Land use within this subbasin is a mixture of forest, agriculture and rural residential.

### RIPARIAN CONDITION

A cultivated garden and ornamental plantings dominate the lower reach of this stream. The landscaped area extends upstream for at least 1000 feet to an area immediately downstream of the first tributary. At this point the creek enters a steeper portion of the ravine and an area of second-growth coniferous and deciduous trees.

Instream structure is provided by moderate amounts of logs, rootwads, tree limbs and brush. Approximately 60 percent of the stream exists in a shaded condition.

### SEDIMENT CONDITION

Overall, the substrate condition of Green Valley Creek was characterized as 10 percent cobble, 40 percent gravel, 30 percent sand, 15 percent mud, and 5 percent bedrock. Pool-to-riffle ratios are reported as 30:70.

## HYDROLOGY

Stream base and low flow information is shown in table Vashon-2 previously. No data was located that indicated changes in stream flows. There are historic water diversion and private water supply structures in this system. The private water supply systems do not appear to be in use as of the year 2000 survey by Washington Trout (In Progress).

## HYDROMODIFICATION

Lateral channel migration is constricted in the vicinity of the small foot bridges found at several locations. The diversion dam and water wheel identified above as a migration barrier are the only other known hydromodifications in this basin.

## **CHRISTIANSON (JOD) CREEK (23)**

Note: Christianson Creek is also referred to as Jod Creek in some literature sources and by local residents.

## FISH PASSAGE

Phil Schneider (WDFW) reported the presence of coastal cutthroat trout in this creek in 1995. A culvert perched approximately 3 feet high at Redding Beach Road is believed to be an impassable barrier to salmonids.

## LAND USE

Land use within this subbasin is a mixture of forest, agriculture and rural residential. There is a single-family residence at the mouth of the creek.

## RIPARIAN CONDITION

The lower stream reaches riparian habitat consists of ornamental plantings and landscaping associated with the residence there. Large boulders have been placed in the stream apparently in an effort to control bank erosion. Upstream of this reach, the riparian condition is typically a mix of second-growth deciduous and coniferous trees and rural residential. Stream channel complexity is provided by abundant amounts of brush and moderate amounts of logs, rootwads and tree limbs. Approximately 70 percent of the stream exists in a shaded condition.

## SEDIMENT CONDITION

Overall, the substrate condition of Christianson Creek was characterized as 5 percent boulder, 15 percent cobble, 30 percent gravel, 30 percent sand, 15 percent mud, and 5 percent bedrock. A landslide approximately 600 feet downstream of Redding Beach Road is depositing a moderate amount of sediments into the creek.

There is an active landslide present in the mainstem Christianson Creek near the confluence with tributary “D” that contributes sediments to downstream reaches. This slide appears to be caused by stormwater discharge from a culvert that carries runoff from Redding Beach Road.

Pool-to-riffle ratios are reported as 1:1.

## HYDROLOGY

No data was located that indicated changes in stream flows. There are at least two private water collection systems in this subbasin. The Christianson Creek Pond and the two ponds (approximately half an acre each) are constructed ponds and also alter stream flow characteristics.

## HYDROMODIFICATION

As noted above there are at least three constructed ponds in this stream system.

## **UNNAMED STREAM (24)**

### FISH PASSAGE

No salmonids have been identified in this creek and there is no direct access to saltwater. A culvert at the mouth of the creek is buried and full of sediment. A hand-dug channel diverts the stream into a wetland immediately upstream of the creek mouth, and inflowing surface water exits the wetland subsurface.

There also is a 4-foot perched culvert upstream of the junction of Cross Landing and Redding roads that would be a barrier if fish were present.

### LAND USE

Deciduous and coniferous forests dominate land use within this subbasin.

### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous trees. Instream complexity is provided by moderate amounts of logs, tree limbs and brush, while rootwads are sparse. Approximately 90 percent of the stream exists in a shaded condition.

Riprap has been placed into the creek at two locations in an apparent effort to stabilize the streambank along a road.

### SEDIMENT CONDITION

Overall, the substrate condition of this unnamed stream (#24) was characterized as 10 percent boulder, 45 percent gravel, 30 percent sand, and 15 percent mud. Pool-to-riffle ratios are reported as 20:80.

#### HYDROLOGY

No data was located that indicated changes instream flows. As noted above, the creek enters the Puget Sound estuary through porous soils at the mouth after being diverted via a hand-dug channel into a wetland.

#### HYDROMODIFICATION

Local road crossings and associated culverts effectively limit lateral channel migration in the vicinity of the Cross Landing and Redding roads.

### **UNNAMED STREAM (26)**

#### FISH PASSAGE

There are no known barriers to anadromous or resident salmonids on the mainstem Unnamed Stream (26). A possible barrier exists at the mouth of the creek where it enters the Puget Sound estuary through a bulkhead. No salmonids were observed in this creek during the year 2000 survey.

#### LAND USE

Land use within this subbasin is a mixture of forest and rural residential.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. Approximately 90 percent of the stream exists in a shaded condition.

#### SEDIMENT CONDITION

Overall,, the substrate condition of unnamed Stream (#26) is characterized as 60 percent gravel and 40 percent sand. Pool-to-riffle ratios are reported as unknown.

#### HYDROLOGY

No data was located that indicated changes in stream flows. Anecdotal information indicates that this stream occasionally goes subsurface and/or dry during late summer.

#### HYDROMODIFICATION

There is no known hydromodification in this stream.

## **UNNAMED TRIBUTARIES (27, 28 AND 29)**

These streams are grouped together because of their similar characteristics and geographic location.

### **FISH PASSAGE**

All three streams enter the Puget Sound estuary via restrictive bulkheads along the shoreline. These bulkheads effectively restrict access from saltwater for anadromous salmonids.

### **LAND USE**

Land use within this subbasin is a mixture of forest and rural residential. The mouth of each creek has single-family residences nearby.

### **RIPARIAN CONDITION**

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. Approximately 60 percent of the stream exists in a shaded condition.

### **SEDIMENT CONDITION**

Overall, the substrate condition of these streams was characterized as 70 percent gravel and 30 percent. Pool-to-riffle ratios are reported as 10:90.

### **HYDROLOGY**

No data was located that indicated changes in stream flows.

### **HYDROMODIFICATION**

No data was located that indicated any hydromodification in these streams.

## **BATES CREEK (30) (H2)**

### **FISH PASSAGE**

There are three private driveway culverts approximately 100 feet upstream of the mouth of the creek that are probable barriers to anadromous fish migration. Cutthroat fingerlings have been observed downstream of these culverts but none were observed upstream.

### **LAND USE**

Land use within this subbasin is a mixture of forest and rural residential

## RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. Instream structure and complexity is provided by moderate amounts of brush, logs, rootwads and tree limbs.

## SEDIMENT CONDITION

Overall, the substrate condition of Bates Creek was characterized as 60 percent gravel, 25 percent sand, and 15 percent mud. Pool-to-riffle ratios are reported as unknown.

## HYDROLOGY

No data was located that indicated changes in stream flows.

## HYDROMODIFICATION

No data was located that indicated the presence of hydromodifications in this stream.

## **SEALTH CREEK (32)**

### FISH PASSAGE

The mouth of Sealth Creek enters the Puget Sound estuary via a bulkhead and is contained within a culvert to a point approximately 200 feet upstream. The bulkhead and associated culvert are barriers and eliminate any marine access to the upper reaches of Sealth Creek by anadromous salmonids.

### LAND USE

Land use within this subbasin is a mixture of forest and rural residential. The mouth of the creek is through Girl Scout camp (Camp Sealth).

### RIPARIAN CONDITION

The riparian condition is a mix of second-growth deciduous and coniferous forest and in the lower reaches is criss-crossed with trails. Stream channel complexity is provided by moderate amounts of brush and tree limbs while there are sparse amounts of logs. No rootwads were present during the year 2000 survey. Approximately 90 percent of the stream exists in a shaded condition.

### SEDIMENT CONDITION

Overall, the substrate condition of Sealth Creek was characterized as 20 percent gravel, 70 percent sand, and 10 percent mud. Pool-to-riffle ratios are reported as 10:90.

## HYDROLOGY

No data was located that indicated changes in stream flows.

## HYDROMODIFICATION

Hydromodification occurs primarily in the reach associated with Camp Sealth.

### **S-1 AND S-2 CREEKS (33 AND 35)**

These creeks are north and south respectively of Spring Beach Creek and are grouped together here because of similar characteristics and geographic location.

## FISH PASSAGE

A sand bar and debris jam at the mouth of S-1 and S-2 eliminates access from marine waters. No salmonids were observed in either creek.

## LAND USE

Land use within these creeks is dominated by deciduous and coniferous forests. A boat in only campsite is associated with the mouth of S-2.

## RIPARIAN CONDITION

Both creeks originate in the steep ravines of the eastern Vashon Island shore. The riparian condition is typically a mix of second-growth deciduous and coniferous forest. Alder with invasive ivy dominates the riparian corridor of S-2.

Instream complexity is dominated by tree limbs and brush with logs and rootwads being sparse or absent. Approximately 100 percent of S-1 and 90 percent of S-2 exists in a shaded condition.

## SEDIMENT CONDITION

Overall, the substrate type of S-1 was characterized as 25 percent gravel, 50 percent sand and 20 percent mud. Substrate type for S-2 was 10 percent gravel, 70 percent sand, and 20 percent mud.

## HYDROLOGY

No data was located that indicated changes in stream flows.

## HYDROMODIFICATION

No information was located that showed any hydromodification in either stream.



## **SPRING BEACH CREEK (34)**

### **FISH PASSAGE**

No salmonids were observed in this creek during the 2000 surveys. The creek flows into the Puget Sound estuary through a perched bulkhead and then travels upstream for approximately 60 feet through a culvert under Spring Beach Creek Road. These are both impassable barriers to anadromous salmonids.

### **LAND USE**

Land use within this subbasin is a mixture of forest and rural residential.

### **RIPARIAN CONDITION**

The creek flows through the group of houses sometimes referred to as Spring Beach. Riparian conditions are a mix of second-growth deciduous and coniferous forest along with ornamental plantings. Instream complexity is provided by moderate amounts of tree limbs and brush, while logs and rootwads are sparse. Approximately 70 percent of the stream exists in a shaded condition.

### **SEDIMENT CONDITION**

Overall, the substrate condition of Spring Beach Creek was characterized as 35 percent gravel, 40 percent sand, and 25 percent mud.

### **HYDROLOGY**

Stream base and low flow information is shown in table Vashon-2 previously. No data was located that indicated changes in stream flows.

### **HYDROMODIFICATION**

A community water system tank approximately 400 feet upstream of the creek's mouth removes water from the creek. Hydromodification also occurs in the reach upstream of the culvert for approximately 350 feet where the creek is confined to a ditch. Upstream of the community water tank, the stream reverts back to a more natural state.

## **SLAIGHTERS CREEK (36)**

### **FISH PASSAGE**

No salmonids were observed in this creek during year 2000 surveys. Impassable barriers are present from the mouth upstream through a culvert to a series of small ponds and at a three-way standpipe in the vicinity of Pohl Road.

#### LAND USE

Land use within this subbasin is primarily residential. The mouth of the creek has numerous single-family residences.

#### RIPARIAN CONDITION

The riparian condition in the lower reaches is inside a natural ravine that with brush and smaller deciduous trees. After moving upstream out of the ravine the creek channel traverses through residential landscaped lots. At Pohl Road, a three-way standpipe brings the three streams and two seeps together. The mainstream channel upstream of this point again traverses through residential landscaped lots before entering a small ravine with similar riparian vegetation to the lower ravine. The percentage of stream shaded is approximately 50 percent.

#### SEDIMENT CONDITION

Overall, the substrate condition of Slaughters Creek is characterized as 75 percent gravel, 15 percent sand, and 10 percent mud. The pool-to-riffle ratio is reported as 10:90.

#### HYDROLOGY

No data was located that indicated changes in stream flows.

#### HYDROMODIFICATION

Hydromodification occurs throughout in the reaches in the residential areas of Slaughters Creek and Pohl Road.

### **TAHLEQUAH CREEK (37)**

Tahlequah Creek runs from north to south, has a drainage basin of 780 acres, and empties into the Puget Sound estuary at the southern tip of Vashon Island.

#### FISH PASSAGE

There are no known barriers to anadromous or resident salmonids on the mainstem Tahlequah Creek. A possible barrier exists on the second left bank tributary (B) where it exits a constructed pond (~3/4 acre) via a stand pipe. Coastal cutthroat were observed in this creek and chum utilization is suspected (Williams 1975).

#### LAND USE

Land use within this subbasin is a mixture of forest and rural residential. The mouth of has numerous single-family residences

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. Stream channel complexity is provided by abundant amounts of brush, moderate amounts of logs and tree limbs and sparse numbers of root wads. Approximately 90 percent of the stream exists in a shaded condition.

After the mainstem creek emerges from the forest upstream of Tahlequah Road, it passes under the road via a large culvert and into a narrow cement trough where it is channelized past several private residences. After passing though a series of small stair-steps and across a rough cement slab the creek enters the Puget Sound estuary.

#### SEDIMENT CONDITION

Overall, the substrate condition of Tahlequah Creek was characterized as 60 percent gravel, 35 percent sand, and 5 percent concrete. The percentage of the stream channel in pools is approximately 10 percent.

#### HYDROLOGY

Stream base and low flow information is shown in table Vashon-2 previously. No data was located that indicated changes in stream flows.

#### HYDROMODIFICATION

Hydromodification occurs primarily in the reach from Tahlequah Road downstream to the where the stream enters the Puget Sound estuary.

### **SHAWNEE CREEK (40)**

#### FISH PASSAGE

The mouth of the creek consists of a 4-foot-high perched bulkhead upstream of which the stream is channelized through a flume prior to being channelized though landscaped private property. Upstream of the first residence, the stream is contained in 150 feet of a 30-inch PVC culvert that goes underneath a private residence prior to being daylighted for 10 feet before entering another culvert underneath Vashon Highway SW. Individually each of these are barriers to anadromous salmonids migration.

#### LAND USE

Land use within this subbasin is a mixture of residential and forest.

## RIPARIAN CONDITION

Upstream of the single-family residences at the mouth of the creek and in its lower reaches, the creek enters an area of second-growth mixed deciduous and coniferous trees.

## SEDIMENT CONDITION

No data was located that indicated overall sediment conditions for Shawnee Creek. Suitable spawning gravels are present in reaches upstream of the piped and channelized reaches.

## HYDROLOGY

No data was located that indicated changes in stream flows.

## HYDROMODIFICATION

Extensive piping and channelization of the lower stream reaches has eliminated any natural stream channel migration.

## **FISHER CREEK (41)**

The Fisher Creek subbasin drains an area of approximately 1,549 acres. The headwaters are north of Old Mill Road and it flows south until it empties into Quartermaster Harbor along the west shore near the mouth of the harbor. Cutthroat trout, coho salmon and sculpin can be found in its lower reaches.

## FISH PASSAGE

There is a potential barrier at 232<sup>nd</sup> Street. WDNR has listed the stream upstream of 232<sup>nd</sup> Street as a Type 3 to the headwater pond approximately ¼ mile upstream of the road crossing. The outlet structure of the headwater pond is a stand-pipe that controls water elevation and is also a possible barrier to upstream migration.

## LAND USE

Land use within this subbasin is a mixture of forest, agriculture and rural residential.

## RIPARIAN CONDITION

Where Fisher Creek leaves saltwater it traverses through a channelized and landscaped reach and then crosses under Vashon Highway SW through a 30-inch culvert. Upstream of the highway the creek traverses through an abandoned blueberry patch before entering a steep walled ravine. This vegetation in this ravine is a mixed coniferous and deciduous second-growth forest with a shrub understory of salmonberry, skunk cabbage, and sword ferns. Only limited information was available that indicated the riparian habitat after the creek exited the ravine. Livestock rearing

occurs in the upper reaches and the headwater pond is a created structure. Approximately 70 percent of the stream is in shaded reaches.

#### SEDIMENT CONDITION

Overall,, the substrate is condition is approximately 5 percent boulders, 15 percent cobble, 30 percent gravel, 30 percent sands, 10 percent mud, and 10 percent bedrock. The creek has an approximate pool-to-riffle ratio of 40:60.

#### HYDROLOGY

The Burton Water Company has facilities located on this creek and withdraws water for domestic use. As is the case with most water withdrawal situations, the greatest need for potable water is during low baseflow periods.

#### HYDROMODIFICATION

The stream channel has been modified in several places as noted previously in the riparian section above.

#### **JUDD CREEK (42)**

Judd Creek was not surveyed by Washington Trout as a part of their year 2000 efforts. It is anticipated that a survey will occur during 2001.

Chum, coho, and chinook salmon (WDFW Spawning Ground Survey Database) along with steelhead trout are known to spawn in this stream system. Coastal cutthroat trout juveniles have also been observed in the lower reaches.

Lack of habitat information is a data gap.

#### **TSUGWALLA CREEK (43)**

##### FISH PASSAGE

There are numerous barriers to anadromous or resident salmonids throughout Tsugwalla Creek. At the mouth of the creek is a constructed 8- to 10-foot-high dam with a 16-foot energy dispersion apron and no plunge pool. This dam has no passage facilities and is an effective barrier to all anadromous salmonids.

No salmonids were observed in any stream reaches of Tsugwalla Creek.

##### LAND USE

Land use within this subbasin is a mixture of forest and agriculture with a few single family residences.

#### RIPARIAN CONDITION

Upstream of the dam is a 2- to 3-acre impoundment (Pond 1) that is connected by a 50-foot culvert to a second pond that is approximately 1.5 acres in size. An earthen dam separates Pond 2 from Pond 3 (~1.5 acres). Apparently some of the water in Pond 3 is used for irrigation purposes as a pump was present during a site survey on June 1, 2000. Upstream of Pond 3 was an intermittent stream that flows from seeps in a wetland area covered with skunk cabbage.

#### SEDIMENT CONDITION

The ponds effectively trap fine sediments and any open stream channels are typically dominated by mud.

#### HYDROLOGY

Hydrology has been extensively modified by the three ponds and water withdrawal.

#### HYDROMODIFICATION

The three ponds, piping system, dam, and concrete apron are all extensive hydromodifications that eliminate salmonid production.

### **RAAB'S LAGOON CREEK (44)**

Raab's Lagoon Creek originates from Maury Island and flows southerly into Quartermaster Harbor.

#### FISH PASSAGE

There are no known barriers to anadromous or resident salmonids on Raab's Lagoon Creek. There is some type of water control structure at the bulkhead at the downstream end of the creek and the exact purpose of this structure is unknown.

#### LAND USE

Land use within this subbasin is a predominantly agriculture with some single-family rural residences.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. A small wetland downstream of Dockton Road is fenced to eliminate livestock intrusion. A braided stream channel traverses through a wetland dominated by skunk cabbage and

bullrush. Approximately 60 percent of the stream exists in a shaded condition primarily with streamside associated shrubs.

#### SEDIMENT CONDITION

The creek is a low gradient system and is dominated by mud (60 percent) and sand (20 percent) with patches of 1-6 inch gavel (20 percent). The amount of the stream in pools is approximately 30 percent.

#### HYDROLOGY

No data was located that indicated changes in stream flows.

#### HYDROMODIFICATION

Local culverts limit stream channel migration. Upstream of the Dockton Road, the stream channel resembles a roadside ditch as it parallels the road before the creek turns northwesterly where it originates from a series of diverse seeps.

### **MILETA CREEK (45)**

#### FISH PASSAGE

Mileta Creek has a drainage basin of approximately 700 acres and drains from Vashon Island into Quartermaster Harbor. Coastal cutthroat have been observed downstream of the culvert at Dockton Road. The culvert at Dockton Road is a 3-foot square box culvert with a 5-1/2-foot vertical drop and represents a barrier to anadromous fish migration. No salmonids were observed upstream of this point. A small tributary (A) that originates from the right bank has a constructed pond at approximately RM 0.05 with a culvert control structure that represents a barrier to anadromous salmonids.

#### LAND USE

Land use within this subbasin is a mixture of forest, agriculture and rural residential.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and a few coniferous trees along with some single family residences. Stream channel complexity is provided by logs, rootwads, tree limbs, and brush. A Volkswagen Beetle (VW Bug) was also present in the stream channel about 200 feet upstream of the crossing at Dockton Road. Approximately 80 percent of the stream exists in a shaded condition.

## SEDIMENT CONDITION

Overall, the substrate types of Mileta Creek were characterized as 10 percent cobble, 40 percent gravel, 30 percent sand, and 20 percent mud. Overall, 40 percent of the stream channel was in pools.

## HYDROLOGY

Stream base and low flow information is shown in table Vashon-2 previously. No data was located that indicated changes in stream flows.

## HYDROMODIFICATION

The northern tributary is channelized inside a culvert for approximately 300 feet in the reach where it parallels 240<sup>th</sup> Street. The box culvert at Dockton Road detailed above in the Fish Access section is also a detrimental hydromodification.

## **ELLIS CREEK (62)**

Ellis Creek is also referred to as Tramp Harbor Creek by some local residents and in some literature.

## FISH PASSAGE

Coastal cutthroat trout were observed at numerous points in this stream. At least two barriers to anadromous fish exist in this creek. A culvert perched 2-feet high at SW Ellisport Road and the Water District #19 water storage basins at approximately RM 0.15.

## LAND USE

land use within this subbasin is a mixture of forest, agriculture and rural residential.

## RIPARIAN CONDITION

The riparian condition is a mix of second-growth deciduous and coniferous forest and rural residential. Larger alders and conifers dominate the riparian zone upstream of the Water District 19 property. However, there was no flow in this reach during a site visit on June 7, 2000. Stream channel complexity is provided by moderate amounts of logs, tree limbs and brush. Rootwads were not observed during the year 2000 survey. Approximately 60 percent of the stream exists in a shaded condition.

## SEDIMENT CONDITION

Overall, the substrate type of Ellis Creek was characterized as 30 percent gravel, 30 percent sand, and 40 percent mud.



## HYDROLOGY

Stream base and low flow information is shown in table Vashon-2 previously. No data was located that indicated changes in stream flows.

## HYDROMODIFICATION

Hydromodification occurs primarily in the reach along Southwest Ellisport Road where the stream channel parallels the roadway, at the Water District #19 instream water storage ponds, which are contained behind dikes and at the road crossings.

## ELLISPORT CREEK (63)

### FISH PASSAGE

Coastal cutthroat trout are the only salmonid to have been observed in this stream. There are no known barriers to anadromous or resident salmonids on the mainstem Ellisport Creek.

### LAND USE

Land use within this subbasin is predominantly of forest. An abandoned oil storage site is located inside the floodplain of the lower reaches of the creek.

### RIPARIAN CONDITION

In the lower reaches, the riparian condition is typically a mix of second-growth deciduous and a few coniferous trees. Once the creek enters the ravine the presence of coniferous trees increases but the riparian zone is still dominated by alders and maples. Instream structure and complexity is supplied by logs from deciduous trees, tree limbs and brush. Very few coniferous tree logs are present in this stream channel.

In a lower reach of the stream a power line parallels the stream channel. The trees (primarily alder and maple) in a 200-foot reach have been cut eliminating any functioning riparian habitat in this reach.

A small mass wasting site is present in ravine that is contributing sediments to downstream reaches. This site is approximately 30 feet by 50 feet in size.

Approximately 70 percent of the stream exists in a shaded condition.

### SEDIMENT CONDITION

Overall, the substrate types of Ellisport Creek are characterized as 10 percent boulder, 20 percent cobble, 30 percent gravel, and 35 percent sand. The percent of stream in pools was approximately 30 percent.

In the lower reaches of the stream there are numerous old bricks and debris that either originated from the abandoned oil transfer site or greenhouses that were historically in this location.

#### HYDROLOGY

No data was located that indicated changes in stream flows. Water District #19 does own property on this stream and historically operated a water storage reservoir that is now abandoned.

#### HYDROMODIFICATION

Hydromodification occurs primarily where the creek is confined by county roads and at culvert crossings. Water District #19 no longer operates the water storage reservoir in this system.

### **BEALL CREEK (64)**

#### FISH PASSAGE

Beall Creek has a drainage basin of 211 acres along the eastern shore of Vashon Island. Juvenile coastal cutthroat have been observed utilizing this stream. Water District #19 has a pump station on this creek and the diversion dam associated with this facility is a complete barrier to upstream salmonid migration.

#### LAND USE

Land use within this subbasin is a mixture of forest and rural residential.

#### RIPARIAN CONDITION

The riparian condition is typically a mix of second-growth deciduous and coniferous forest and rural residential. Brush is abundant throughout the stream. Logs and tree limbs are termed moderate and rootwads sparse.

#### SEDIMENT CONDITION

No information on the condition of sediments in this stream was located.

#### HYDROLOGY

No data was located that indicated changes in stream flows. The Water District #19 pump station is a consumptive use of water in this stream. Water is diverted out of the stream for potable water use.

#### HYDROMODIFICATION

A water diversion dam and associated pump station are the dominate hydromodifications in this subbasin.

## **GORSUCH CREEK (65)**

### **FISH PASSAGE**

Gorsuch Creek drains from the eastern shoreline of Vashon Island. There are several potential barriers to anadromous or resident salmonids on the mainstem Gorsuch Creek, but coastal cutthroat have been observed upstream as far as approximately RM 0.4. These barriers include natural features (e.g., boulder and cobble cascades) and anthropogenic barriers (e.g., an old washed out bridge). A culvert at approximately RM 0.5 that is perched is a barrier to anadromous salmonid migration. The last fish observed during year 2000 surveys was located a about 150 feet downstream of this barrier.

### **LAND USE**

Land use within this subbasin is a mixture of forest and rural residential. are Single-family residences and an old apple orchard are present at the mouth of the creek.

### **RIPARIAN CONDITION**

The riparian condition is dominated by larger second-growth deciduous trees with smaller numbers of coniferous trees. Stream channel complexity is provided by abundant amounts of logs and tree limbs, while rootwads are sparse. Approximately 70 percent of the stream exists in a shaded condition.

At the mouth of the creek is an old apple orchard and grass meadow. Grass and low shrubs cover the stream upstream of the tidewater beach. The creek then enters an area of shrubs composed of salmonberry, sword fern and nettles. The creek then enters riparian zones composed of larger big leaf maple and alder trees with some Douglas fir and small cedars.

### **SEDIMENT CONDITION**

Overall, the substrate condition of Gorsuch Creek was characterized as 20 percent boulder, 20 percent cobble, 20 percent gravel, 20 percent sand, and 20 percent bedrock. In the lower reaches where the stream drops through a ravine, the stream gradient can be quite high (15 percent). In this reach, the substrate is composed of boulders, clay and cobbles with pockets of gravels. Rock impediments are located in several reaches of the stream but do not appear to be barriers coastal cutthroat were observed upstream.

### **HYDROLOGY**

No data was located that indicated changes in stream flows. A sewage treatment plant is in operation in the upper reaches of Gorsuch Creek. Survey crews from Washington Trout

(Washington Trout In Progress) noted on their June 6, 2000 survey that the effluent from the sewage treatment plant was almost the entire streamflows at the facility discharge point and that the water was quite discolored. The channel was dry upstream of sewage treatment plant.

## HYDROMODIFICATION

Hydromodification occurs primarily in the vicinity of culverts at road crossings and at the sewage treatment plant.

## DILLWORTH CREEK (66)

### FISH PASSAGE

A natural barrier to anadromous or resident salmonids is present approximately 800 feet upstream from the mouth of Dillworth Creek. This barrier is a small bedrock waterfall that has headcut into a layer of clay with debris jams immediately downstream. A wooden bulkhead at the mouth of the creek does not appear to be a barrier as of this date.

A culvert at approximately RM 0.4, upstream of Dillworth Road is undermined and is a probable barrier. A natural waterfall (~3 feet high) at approximately RM 0.15 may be a barrier at some flows. The last fish observed during year 2000 surveys was located in the vicinity of the culvert that crosses underneath Dillworth Road.

### LAND USE

Land use within this subbasin is a mixture of forest, agriculture and rural residential.

### RIPARIAN CONDITION

The riparian condition is dominated by deciduous trees with smaller numbers of coniferous trees. Stream channel complexity is provided by abundant amounts of logs, rootwads, tree limbs and brush. Approximately 70 percent of the stream exists in a shaded condition.

### SEDIMENT CONDITION

Overall, the substrate condition of Dillworth Creek was characterized as 25 percent boulder, 35 percent cobble, 15 percent gravel, and 25 percent bedrock. In the lower reaches where the stream gradient is fairly low (~4 percent), there are numerous small debris jams with cobble and boulders. The creek travels through a seam of clay at approximately 800 feet upstream from its mouth. This seam of clay forms the barrier mentioned above. Upstream of these falls the stream gradient increases before flattening out as it exits the ravine.

### HYDROLOGY

No data was located that indicated changes in stream flows.

### HYDROMODIFICATION

Hydromodification occurs primarily in the vicinity of culverts at road crossings and at an unfinished diversion just upstream of Dillworth Road.

## **GLEN ACRES CREEK**

### **FISH PASSAGE**

Glen Acres Creek drains from the northeastern shoreline of Vashon Island. A bulkhead at the mouth of the creek is perched approximately 4 feet above the beach and represents a complete barrier to anadromous fish access. No salmonids were observed during a June 8, 2000 survey.

### **LAND USE**

Land use within this subbasin is a mixture of forest and rural residential.

### **RIPARIAN CONDITION**

The riparian condition is dominated by deciduous trees with smaller numbers of coniferous trees. Stream channel complexity is provided by moderate amounts of logs, rootwads, tree limbs and brush. Approximately 80 percent of the stream exists in a shaded condition.

### **SEDIMENT CONDITION**

Overall, the substrate condition of Glen Acres Creek was characterized as 10 percent cobble, 40 percent gravel, 30 percent sand, and 20 percent mud.

### **HYDROLOGY**

No data was located that indicated changes in stream flows.

### **HYDROMODIFICATION**

Hydromodification occurs at the mouth of the creek where a bulkhead is present.

### **LIST OF TABLES**

Table Vashon-1: Vashon-Maury Island Streams, Fish Presence, Barriers and Water Withdrawals

Table Vashon-2: Stream Flows of Selected Streams on Vashon-Maury Islands

Table Vashon-3: Streams and Drainage Areas for Water Quality Sampling Stations

Table Vashon-4: Shinglemill Creek and Selected Stream Substrate Types

Table Vashon-5: Pool-to-Riffle Ratios in Shinglemill Creek Subbasin