

## Appendix A

### Mason County Public Health 303(d) listed streams data summary

**Table 1 - Site Descriptions, Fecal Coliform 303(d) Listing ID, Hydrologic Unit Code, and Site Locations**

Creek	Site ID	303(d) Listing ID	HUC	Site Description	Lat	Long	Comments
Big Bend	BG-01	45568	17110018014601	Big Bend at mouth	47.34816000	-123.07386000	Not requesting removal from 303(d) list for fecal coliform
Deveraux	DE-01	45567	17110018014666	Deveraux Creek above SR 106, access granted at 21923 HWY 3, (large property access off of 106) access upland river right	47.42994000	-122.84820000	Not requesting removal from 303(d) list for fecal coliform
Happy Hollow	HA-01	40619	17110018014644	Happy Hollow Creek @ mouth below 106	47.38820000	-122.91590000	
Holyoke	HO-01	6965	17110018014667	Holyoke Creek @ mouth below 106 access at 17051 SR 106	47.40667000	-122.88619000	
Lilliwaup	LI-01	9889	17110018000633*	Lilliwaup Creek below 101, access from northern side, permission to access/park from northern camping property	47.46327351	-123.11434390	*Monitoring Location was under the north side of the HWY 101 Bridge, we monitored ~ 1500' downstream from the end of the listed HUC segment
Little Mission	LM-01	6962	17110018000669	Little Mission Creek upstream at Beck RD right before the creek enters Belfair State Park	47.43025000	-122.88146000	
Mulberg	MU-01	45581		Mulberg Creek above SR 106 exiting concrete wall/weir	47.38715000	-122.92506000	
Shoofly	SH-01	6960	17110018000683	Shoofly Creek above Northshore Rd, next to 9381 NSR (not shoofly that is signed by mason county)	47.39019000	-122.98707000	
Stimson	ST-01	6959	17110018000675	Stimson Creek @ Mouth access granted from 5041 NE Northshore RD, flow taken at plank across creek, sample taken at end of concrete wall	47.41690000	-122.90815000	
Trails End	TE-01	6966	17110018014671	Trails End Creek at mouth, access granted from 17591 SR 106	47.40870772	-122.87812650	Not requesting removal from 303(d) list for fecal coliform
Twanoh	TW-01	6961	17110018014638	Twanoh Creek at mouth/end of trees in State Park	47.37851000	-122.97425000	
Twanoh Falls	TF-01	6964	17110018014643	Twanoh Falls Creek above SR 106, just above small waterfall, access granted at 20 Creekside drive	47.38152000	-122.94907000	

**Table 2 - Summary of Hood Canal data collected by MCPH July 2010 to September 2011**

Creek	GMV	90th Percentile	MIN	MAX	# of samples >100 FC	# of Samples	% of Samples >100FC	Meets WQ Standard
Big Bend	37	162	8	1600	3	13	23%	Exceedance
Deveraux	28	205	2	900	6	14	43%	Exceedance
Trails End	30	274	2	300	4	13	31%	Exceedance
Happy Hollow	4	15	2	30	0	10	0%	NAP
Holyoke	15	62	4	170	1	10	10%	NAP
Lilliwaup	10	28	4	80	0	10	0%	NAP
Little Mission	10	52	2	70	0	10	0%	NAP
Mulberg	11	60	2	500	1	11	9%	NAP
Shoofly	3	4	2	8	0	10	0%	NAP
Stimson	3	12	2	17	0	10	0%	NAP
Twanoh Falls	4	17	2	110	1	11	9%	NAP
Twanoh	7	50	2	110	1	11	9%	NAP

GMV = Geometric Mean Values

NAP = No Apparent Problem

All Fecal Coliform results are MPN FC/100mL of water

**Table 3 - Actual Data Collected by Month (normally monitoring occurred during 2 consecutive days)**

Site/Creek	July, 2010	August, 2010	September, 2010	October, 2010	November, 2010	December, 2010	January, 2011	February, 2011	March, 2011	April, 2011	May, 2011	June, 2011	July, 2011	August, 2011
BG-01 - Big Bend		30	80	17	170	8	8	14	11	13	1600	17	130	80
DE-01 - Deveraux	170	13	110	50	900	130	2	2	8	2	4	220	110	22
TE-01 - Trails End		30	300	23	26	23	13	2	13	2	300	30	130	170
HA-01 - Happy Hollow		13	4	2	30	2	2	2	2	8	2			
HO-01 - Holyoke		170	30	8	30	50	4	4	4	23	6			
LI-01 - Lilliwaup		14	8	4	80	22	4	4	4	13	13			
LM-01 - Little Mission		70	14	50	8	11	2	8	2	2	26			
MU-01 - Mulberg	4	23	60	13	500	2	8	4	11	2	4			
SH-01 - Shoofly		4	4	4	4	2	2	2	2	2	8			
ST-01 - Stimson		11	17	2	4	2	2	2	4	2	2			
TF-01 - Twanoh Falls	4	17	2	8	110	4	2	2	2	2	2			
TW-01 - Twanoh	50	30	11	8	110	4	2	2	2	2	2			

**Table 4 - Summary of Hood Canal 303(d) data from 1997-2008**

	Name	# samples	Range (Fc/100mL)		WA State Standards for Freshwater for Extraordinary Contact				Meets Extraordinary WQ Standard?	Sampling Start Date	Sampling Finish Date	Data Source	
			min	max	Geometric Mean Value (GMV) of >50 Fc/100mL		<10% of samples shall be >100 Fc/100mL						
					GMV	Meets GMV standard?	# samples >100 Fc/100ml	% samples > 100 Fc/100 mL					Meets % standard?
1	Lilliwaup Creek	24	1.9	52	12.6	Yes	0	0%		NAP	1/27/2004	11/13/2006	MCPH
2	Lilliwaup Creek	13	1	350	19.6	Yes	3	23%	No	Exceedance	10/16/1997	4/20/2005	DOE
3	Big Bend Creek	14	1	290	15.1	Yes	3	21%	No	Exceedance	1/5/2004	5/17/2005	DOE
4	Twanoh Creek	17	1	216	9.1	Yes	4	24%	No	Exceedance	1/5/2004	8/7/2008	DOE
5	Twanoh Falls Creek	14	1	64	5.5	Yes	0	0%	Yes	NAP	1/5/2004	5/17/2005	DOE
6	Mulburg Creek	14	1	310	11.3	Yes	3	21%	No	Exceedance	1/5/2004	5/17/2005	DOE
7	Happy Hollow Creek	14	1	160	10.0	Yes	1	7%	Yes	NAP	1/5/2004	5/17/2005	DOE
8	Holyoke Creek	14	1	68	6.5	Yes	0	0%	Yes	NAP	1/5/2004	5/17/2005	DOE
9	Trails End Creek	3	3	18	6.0	Yes	0	0%	Yes	NAP	3/22/2005	5/17/2005	DOE
10	Deveraux Creek	12	1	532	9.1	Yes	2	17%	No	Exceedance	1/5/2004	5/17/2005	DOE
11	Little Mission Creek	31	1.9	1600	17.9	Yes	4	13%	No	Exceedance	11/15/2004	6/26/2007	MCPH
12	Little Mission Creek	12	1	510	13.0	Yes	2	17%	No	Exceedance	10/29/2002	9/23/2003	DOE
13	Stimpson Creek	37	1.9	240	12.3	Yes	3	8%	Yes	NAP	1/20/2004	6/26/2007	MCPH
14	Stimpson Creek	20	1	180	12.9	Yes	2	10%	No	NAP	10/29/2002	9/7/2004	DOE
15	Shoofly Creek	28	1.9	300	6.7	Yes	2	7%	Yes	NAP	1/20/2004	9/19/2006	MCPH
16	Shoofly Creek	8	2	76	11.3	Yes	0	0%	Yes	NAP	3/4/2004	9/7/2004	DOE

1. All data is for Fecal Coliform colonies/100mL of water. MCPH uses MPN method, MCPH did not research what method was utilized for the data that was obtained from EIM, although it is likely to be membrane filtration.
2. GMV = Geometric Mean Value, NAP = No Apparent Problem, DOE = Department of Ecology, and MCPH = Mason County Public Health
3. Cells colored blue represent sites that have had at least 10 monitoring events either as listed in EIM or from MCPH's existing data.
4. Cells colored pink do not meet either the geometric mean value or percentile standard of the Extraordinary Water Contact Standard.

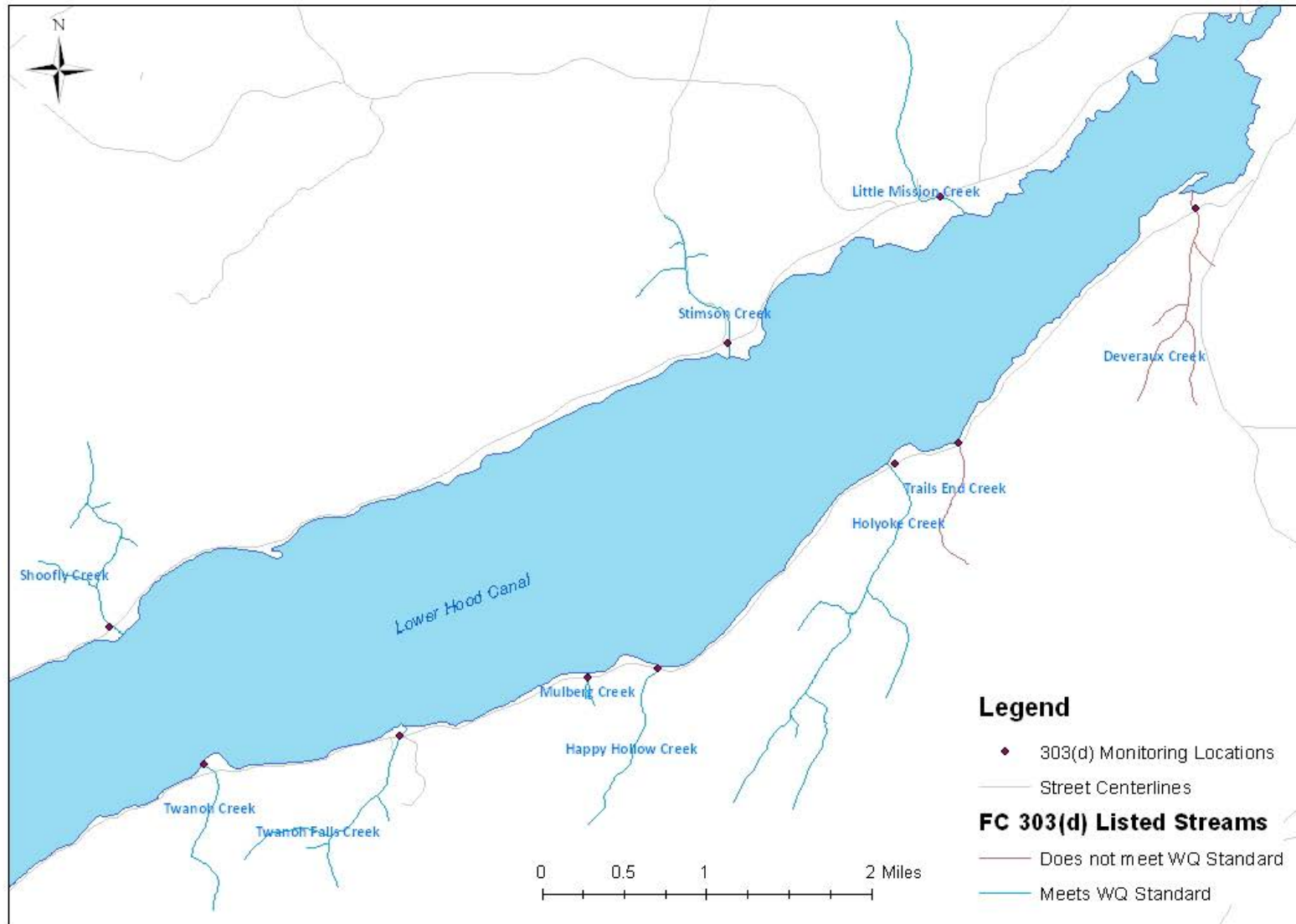
**Table 5 - Precipitation Data Summary in Inches**

Monitoring Date	Day of Monitoring	Previous Day	Cumulative day and previous	2 Days Previous	Cumulative day and 2 days previous
7/20/2010	0.00	0.00	0.00	0.00	0.00
8/10/2010	0.00	0.01	0.01	0.01	0.02
8/11/2010	0.00	0.00	0.00	0.01	0.01
9/20/2010	0.14	0.24	0.38	0.81	1.19
9/21/2010	0.00	0.14	0.14	0.24	0.38
10/18/2010	0.00	0.00	0.00	0.00	0.00
10/19/2010	0.00	0.00	0.00	0.00	0.00
11/1/2010	2.15	0.10	2.25	0.26	2.51
11/2/2010	0.16	2.15	2.31	0.10	2.41
12/13/2010	0.32	3.14	3.46	2.41	5.87
12/14/2010	0.57	0.32	0.89	3.14	4.03
1/24/2011	0.14	0.22	0.36	0.00	0.36
1/25/2011	0.00	0.14	0.14	0.22	0.36
2/22/2011	0.02	0.02	0.04	0.00	0.04
2/23/2011	0.28	0.02	0.30	0.02	0.32
3/7/2011	0.00	0.00	0.00	0.02	0.02
3/8/2011	0.35	0.00	0.35	0.00	0.35
4/5/2011	0.52	0.76	1.28	0.06	1.34
5/2/2011	0.30	0.00	0.30	0.00	0.30
6/13/2011	0.02	0.05	0.07	0.04	0.11
7/13/2011	0.06	0.15	0.21	0.00	0.21
8/3/2011	0.00	0.00	0.00	0.00	0.00

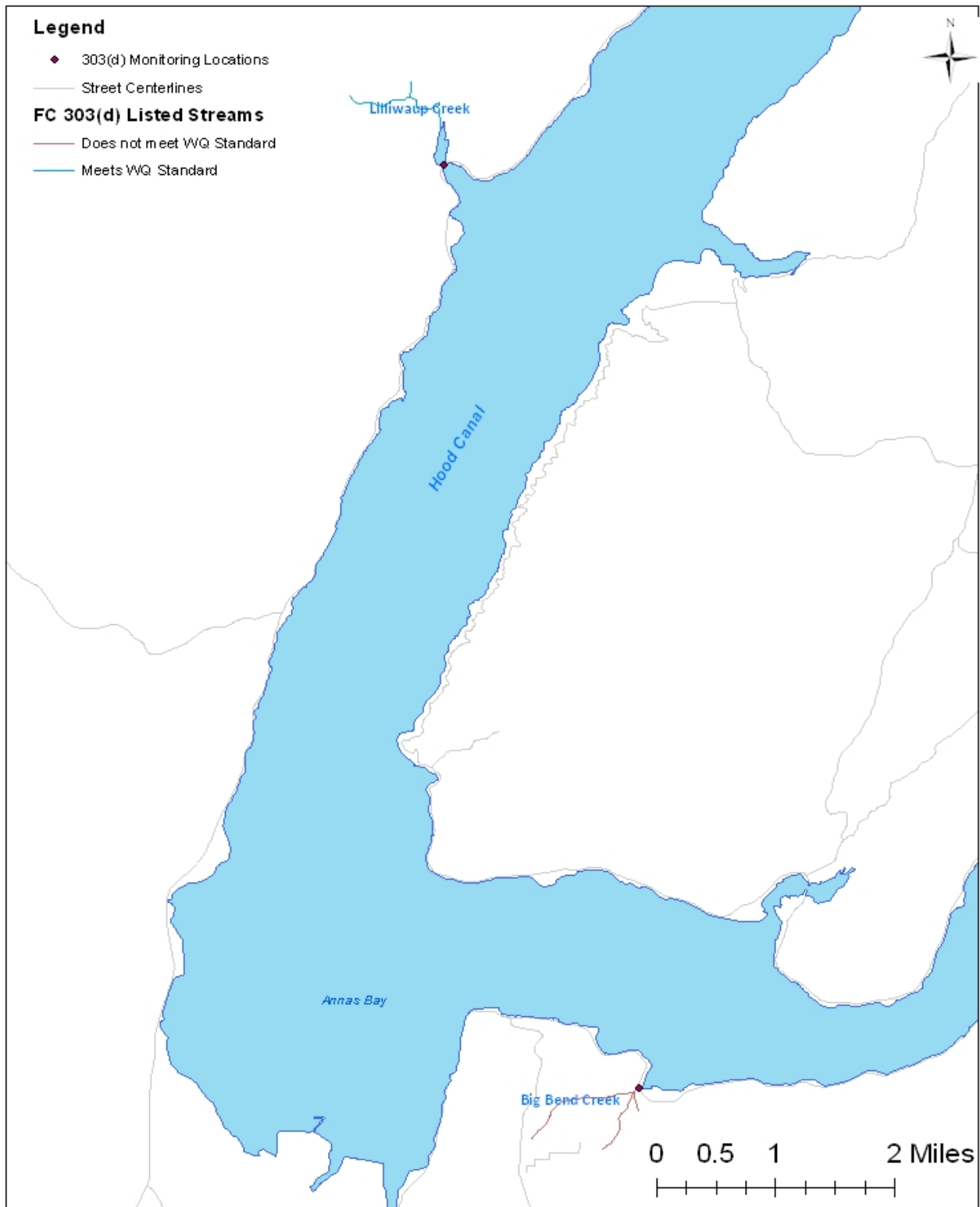
- Data was obtained from [www.weatherunderground.com](http://www.weatherunderground.com) for Union, Washington (98592) because of its central location to all monitoring locations.
- Day of Monitoring represents the 24 hour precipitation data for the date of monitoring (from 12:00 am to 11:59 pm)
- Previous Day represents the day prior to the day of monitoring (from 12:00 am to 11:59 pm)
- Cumulative day and previous represents the sum of the day of monitoring and the previous day columns
- 2 Days Previous represents 2 days prior to the day of monitoring (from 12:00am to 11:59 pm)
- Cumulative day and 2 days previous represents the sum of the day of monitoring, the previous day and the 2 previous days.

## Appendix B – Monitoring Locations and 303(d) Listed Stream Maps

### Lower Hood Canal 303(d) listed streams and MCPH Monitoring Locations



# Hood Canal 303(d) listed streams and MCPH Monitoring Locations



## Appendix C - Specific Watercourse Listings, Development Summaries and Sites of Concern

### Happy Hollow Creek



- Category 5 – fecal coliform (listing ID 40619).
- Happy Hollow Creek sub-basin is mostly timber or cleared land with a small amount of development near the mouth. The creek is ~1.1 miles long. There are less than 20 known developed parcels adjacent to the creek. There is a store located adjacent to the creek on the south side of SR 106, which was identified as having a failing septic system in 2007. The system was repaired in 2007.
- There are no known fecal coliform concerns in the marine water.
- Fecal coliform results collected from Happy Hollow Creek from August, 2010 to May 2011, did not exceed 100 FC/100mL. Happy Hollow Creek meets the Extraordinary Water Quality Standard.

### Lilliwaup Creek



- Category 5 – fecal coliform (listing 9889)
- The Lilliwaup Creek sub-basin consists of forested timberland. Lilliwaup Creek is ~7 miles long. There are less than 25 known developed parcels located near the mouth of this creek. No developed sites of concern have been identified.
- Fecal coliform results collected from Lilliwaup Creek from August, 2010 to May 2011, did not exceed 100 FC/100mL. Lilliwaup Creek meets the Extraordinary Water Quality Standard.

### Little Mission Creek

- Category 5 – fecal coliform (listing ID 6962).
- The Little Mission Creek sub-basin is has a mixture of development within the lower ~0.6 miles of the creek and forested land in the upper reaches of the creek. There are ~10 developed parcels directly adjacent to the creek. Little Mission Creek's



headwaters originate in a forested wetland area and flow ~3.6 miles down to Hood Canal. Little Mission Creek flows through Belfair State Park before entering Hood Canal.

- Fecal coliform results collected from Little Mission Creek from August, 2010 to May 2011, did not exceed 100 FC/100mL. Little Mission Creek meets the Extraordinary Water Quality Standard.

#### Stimson Creek

- Category 5 – fecal coliform (listing ID 6959)
- The Stimson Creek sub-basin is almost completely undeveloped, forested land. The creek is ~3 miles in length and originates in a forested wetland area. There are ~4 developed parcels within ~0.2 miles of the mouth of the creek, while the rest of the creek is undeveloped. Elfendahl Pass Rd parallels the creek, however the ~1.85 miles of the road is currently closed due to flooding from 2007. This limits the access to the creek. In the past, Mason County did have some problems with illegal garbage dumping from Elfendahl Pass RD. Wildlife waste may play a critical role in the fecal coliform loading in this stream.
- Marine water at the mouth of Stimson Creek is listed as category 5 for fecal coliform (listing ID 6941). WA-DOH classifies the shellfish beds as approved at the mouth of Stimson Creek.
- Fecal coliform results collected from Stimson Creek from August, 2010 to May 2011, did not exceed 100 FC/100mL. Stimson Creek meets the Extraordinary Water Quality Standard.

#### Shoofly Creek

- Category 5 – fecal coliform (listing ID 6960)
- The Shoofly Creek sub-basin is mostly undeveloped, although there is a small amount of development at the mouth of the creek. The creek is ~1.8 miles in length. There are less than ten developed parcels directly adjacent to Shoofly Creek, mostly located near the mouth. The rest of the area is forested.
- There are no known fecal coliform pollution concerns in the adjacent marine water.
- Fecal coliform results collected from Shoofly Creek from August, 2010 to May 2011, did not exceed 100 FC/100mL. Shoofly Creek meets the Extraordinary Water Quality Standard.

#### Twano Creek



- Category 5 – fecal coliform (listing ID 6961).
- Twano Creek sub-basin consists of completely undeveloped forested land owned either by the State of Washington or Green Diamond Resources. Twano State Park is located at the mouth of the creek. Twano Creek is ~ 1.5 miles long. The drainfield for Twano State Park is located at the top of a hill and at its closest, is over 800' away from Twano Creek. However, the transport lines for the system run along and under the creek. Twano State Park was found to have a failing large onsite septic system in 2005, which was repaired the following year. Currently, there are no sites of concern along this creek.
- The marine water ~1000' east of the mouth of Twano creek is listed as category 2 for fecal coliform (listing ID 39826).
- There was one fecal coliform result that exceeded 100 FC/100mL that was collected from Twano Creek between August, 2010 and May 2011. Twano Creek meets the Extraordinary Water Quality Standard.



### Twanoh Falls Creek



- Category 5 – fecal coliform (listing ID 6964).
- The Twanoh Falls Creek sub-basin consists of some development in the lower reaches and forested land in the upper reaches. The creek is ~1.7 miles long, with all of the development located within the lower ~0.6 miles. There are less than 30 known developed parcels directly adjacent to the creek.
- The nearest marine water concern is located at the mouth of the next little unnamed drainage ~800' to the east of Twanoh Falls Creek.
- There was one fecal coliform result that exceeded 100 FC/100mL that was collected from Twanoh Falls Creek between August, 2010 and May 2011. Twanoh Falls Creek meets the Extraordinary Water Quality Standard.

### Mulburg Creek



- Category 5 – fecal coliform (listing ID 45581).
- Mulburg Creek sub-basin consists of a mixture of development and forested or cleared lands. The creek is ~0.3 miles in length. There ~4 developed parcels located near the mouth of the stream. Moving upstream, the creek then passes through some forested land. There is a closed woodwaste landfill located to the west of this creek. There is also cement wall impounded pond area with a v-notch weir located just upstream from SR 106. MCPH did note waterfowl in this pond on several occasions. Also, there is a duplex located adjacent to the creek that had a failing on-site septic system that was repaired several years ago.
- There are no known fecal coliform concerns in the marine water.
- There was one fecal coliform result that exceeded 100 FC/100mL that was collected from Mulburg Creek between August, 2010 and May 2011. Mulburg Creek meets the Extraordinary Water Quality Standard.

### Holyoke Creek



- Category 5 – fecal coliform (listing ID 6965).
- The Holyoke sub-basin consists of forest land and development. The creek is ~2.5 miles in length, of which, ~1.5 miles flows through forested land. There is development located at the mouth (~6 parcels) and in the upper reaches (~10 parcels) of Holyoke Creek.
- There was one fecal coliform result that exceeded 100 FC/100mL that was collected from Holyoke Creek between August, 2010 and May 2011. Holyoke Creek meets the Extraordinary Water Quality Standard.

### Big Bend Creek



- Category 5 –fecal coliform (listing ID 45568).
- The Big Bend Creek sub-basin is mostly undeveloped. Big Bend Creek is approximately a mile in length. The development that exists is near to the mouth of the creek. In the upper reach it passes through mostly forested land. Almost of all of the development adjacent to the creek is within the 1000' of the mouth of the creek. There are less than 30 known developed parcels along this creek. There is a mobile home/trailer park near the mouth of this creek this is of interest.
- The WA DOH Shellfish Program lists the area that Big Ben Creek flows into as conditionally approved. This is due to the Alderbrook sewer outfall located to the East of the mouth of this creek.
- There were three fecal coliform results that exceeded 100 FC/100mL, which were collected from Big Bend Creek between August, 2010 and August 2011. Big Bend Creek DOES NOT currently meet the Extraordinary Water Quality Standard.

### Trails End Creek

- Category 5 – fecal coliform (listing ID 6966)
- The Trails End Creek Sub-basin consists of forestland and development. There are a lot of created parcels within the drainage area that are not currently developed. There are ~3 developed parcels at the mouth and ~10 developed parcels in the upper reaches of Trails End Creek. The creek is ~1.7 miles long. From the aerial photos the creek does not appear to actually originate from Trails End Lake, further field investigation is needed to verify if this is correct.
- There are no known fecal coliform concerns in the marine water.

- There were four fecal coliform results that exceeded 100 FC/100mL, which were collected from Trails End Creek between August, 2010 and August 2011. Trails End Creek DOES NOT currently meet the Extraordinary Water Quality Standard.

#### Deveraux Creek

- Category 5 – fecal coliform (listing ID 45567).
- The Deveraux Creek sub-basin consists of mixed forest and development. There are less than 20 developed parcels adjacent to the creek. The creek originates in Lake Deveraux. The creek is ~1.45 miles long. Lake Deveraux is mostly undeveloped-forested land. There are eleven developed parcels adjacent to the shoreline and a girl-scout camp.
- Marine water at the mouth of Deveraux Creek is listed as category 5 - fecal coliform (listing ID - 6939). In addition, DOH classifies the shellfish harvesting area at the mouth of Deveraux Creek as prohibited.
- There were six fecal coliform results that exceeded 100 FC/100mL, which were collected from Deveraux Creek between August, 2010 and August 2011. Deveraux Creek DOES NOT currently meet the Extraordinary Water Quality Standard.