

DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
Quarterly Report

April 21, 2009

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THROUGH: George Onwumere, Unit Supervisor, Environmental Assessment Program

SUBJECT: Liberty Bay Tributaries Fecal Coliform TMDL Quarterly Report #2
Project Code: 08-023-01

Introduction

Liberty Bay and Johnson, Big Scandia, Little Scandia, Lemolo, Bjorgen, and Barrantes Creeks were listed by the Washington State Department of Ecology (Ecology) for exceeding Washington State fecal coliform (FC) bacteria criteria.

Ecology is required, under section 303(d) of the federal Clean Water Act and U.S. Environmental Protection Agency (EPA) regulations, to develop and implement Total Maximum Daily Loads (TMDLs) for impaired waters.

While the overall goal of the TMDL is to improve water quality in Liberty Bay, this study is focusing on the analysis of the freshwater creek and stormwater FC contributions to the bay. Ecology will be targeting freshwater sources most likely to contribute to marine FC but the TMDL cannot provide an estimate of the resulting change in FC concentrations at marine sampling locations in the bay.

This memorandum is the second in a series of four quarterly reports that summarizes FC data from August 2008 through March 2009 and other project progress from December 2008 through March 2009. All data presented are provisional; data quality has not yet been checked.

Progress to Date

The final Liberty Bay TMDL Quality Assurance Project Plan (QAPP) was posted on the web in January 2009. It can be found at

<https://fortress.wa.gov/ecy/publications/SummaryPages/0903102.html>.

Data Collection

- Collected 20 to 31 membrane filtered FC samples during each of the 16 surveys completed from August 2008 through March 2009 (Table 1). About 20 percent of the samples were replicated for quality assurance purposes.
- Sampled all inputs to Liberty Bay during a dry weather sampling survey in October 2008 (Table 2).
- Sampled several investigatory sites one to ten times from October 2008 through March 2009 (Table 2).
- Measured streamflow at most sites during bacteria sampling. Streamflows that were not measured in the field will be calculated using regression or estimated later.
- Measured in situ temperature and conductivity at all sites during regular bacteria sampling. Results are not included in this report.
- Ecology (Sally Lawrence and Trevor Swanson) and Kitsap County (Stuart Whitford) presented an overview of water quality sampling efforts and preliminary results at a Poulsbo city council meeting on April 8, 2009.
- Completed a wet weather beach walk and outfall investigation documenting most of the outfalls and storm drains to Liberty Bay from Poulsbo, Keyport, and surrounding communities.
- No rain events were sampled. Most rain events had too little rain, rain that fell when sampling was not possible, or did not have adequate preceding dry periods.

Data Results and Comparison to Washington Surface Water Quality Standards

Ecology reviewed the preliminary FC sample results collected from August through March and compared them to Washington State Surface Water Quality Standards (WAC-173-201A). Ecology detected violations of the geometric mean criterion at six fixed-network sites and violations of the 90th percentile criterion at 17 of the fixed-network sites (Table 1).

Project Schedule and Upcoming Tasks

- Ecology will continue tracking rainfall for storm/rain event sampling.
- One to two additional dry-period synoptic surveys are planned for summer 2009.
- The site at Johnson Creek (15-JOH-0.1) was moved farther downstream to capture any influence from a small tributary that flows into Johnson Creek approximately 200 feet downstream of Viking Way.
- More investigatory sites may be sampled if deemed appropriate. Ecology may continue sampling investigatory sites that have already been sampled.
- Ecology is trying to arrange a tour of the Keyport Navy Facility and its stormwater outfalls in June 2009.
- The next quarterly report will be available in July 2009.

Attachments:

Table 1. Preliminary FC sampling results at fixed-network sites in the Liberty Bay watershed.

Table 2. Preliminary FC sampling results at investigatory and dry-period survey sites in the Liberty Bay watershed.

Figure 3. Map of Liberty Bay watershed with site numbers referencing Table 1.

Tables

Table 1. Fecal coliform (colony forming units per 100 mL) at regularly sampled stations (fixed-network sites) in the Liberty Bay watershed. Yellow and orange highlighted values do not meet Washington State surface water quality criterion. Map numbers reference Figure 1. Dashes denote no sample taken.

Site ID w/ stream mile	Map #	Site description	Aug 12	Aug 26	Sept 10	Sept 24	Oct 8	Oct 22	Nov 11	Nov 24	Dec 10	Dec 29	Jan 14	Jan 28	Feb 11	Feb 25	Mar 11	Mar 24	n	Min	Max	Geo-metric mean	90th percen-tile	
Dogfish Creek																								
15-DOG-0.6	1	Mainstem behind dental office on Bond Rd., downstream of HWY 305 crossing	65	110	43	66	88	32	63	52	21	390	17	19	24	31	12	15	16	12	390	41	130	
15-SFD-0.0	2	South fork at Bond Rd. and 1st Ave., 50 ft. downstream of culvert	360	120	26	31	84	12	65	9	290	540	31	180	190	280	18	32	16	9	540	72	379	
15-SFD-1.3	3	South fork at 8th Ave. and Iverson, upstream side of culvert	61	72	170	71	140	46	41	8	330	340	29	66	130	170	3	6	16	3	340	56	328	
15-EFD-0.0	4	East fork at Little Valley Rd., downstream side of culvert	180	80	51	34	220	92	51	4	10	68	5	2	30	15	30	5	16	2	220	26	159	
15-EFD-1.2	5	East fork off Bond Rd. at Pugh Rd., upstream side of culvert	60	67	16	29	9	4	3	12	51	130	9	5	51	7	4	10	16	3	130	15	70	
15-WFD-0.0	6	West fork at Little Valley Rd., downstream side of culvert	75	180	110	31	18	18	43	45	23	270	9	14	10	33	10	25	16	9	270	33	123	
15-WFD-0.9	7	West fork at first Big Valley Rd. crossing near Living Waters Farm, up of culvert	57	80	19	28	13	18	37	30	17	170	4	1	4	6	6	8	16	1	170	15	80	
Johnson Creek																								
15-JOH-0.1	8	Mainstem south of Norfin Ln., 200ft. downstream of tributary	8	120	4	140	220	2	11	1	1	87	190	3	15	17	6	2	16	1	220	13	143	
Big Scandia Creek																								
15-BSC-0.0	9	Mainstem at mouth near the end of Scandia Ct. at private property. Trail to ck.	180	110	14	40	80	40	56	3	31	230	5	17	44	43	13	56	16	3	230	35	159	
15-BSC-0.1	10	Mainstem at Scandia Rd, upstream side of bridge	79	110	36	35	88	20	6	2	44	260	9	6	24	56	80	52	16	2	260	31	160	
15-BSC-1.1	11	Mainstem at HWY 308 between Viking Way and Cox Ave., downstream of culvert	35	110	6	10	28	7	11	2	1	55	14	5	12	110	9	5	16	1	110	12	65	
15-BSC-1.6	12	Mainstem at HWY 308 just west of Cox Ave., upstream side of culvert	84	72	32	31	88	7	3	9	1	340	14	40	11	41	24	4	16	1	340	20	135	
Little Scandia Creek																								
15-LSC-0.1	13	Mainstem at Scandia Rd. behind church, upstream side of culvert	1600	660	410	670	77	140	46	250	55	320	40	110	340	270	3	34	16	3	1600	142	1004	
15-LSC-0.4	14	Mainstem at Blomster Way, upstream side of culvert	920	150	260	640	180	160	41	3	6	100	6	99	28	67	4	9	16	3	920	51	521	
Daniels Creek																								
15-DAN-0.0	15	Mainstem off HWY 308, near residence at 14510, upstream side of culvert	590	62	540	450	450	100	29	15	23	23	17	10	20	120	18	280	16	10	590	68	450	
15-DAN-0.2	16	Mainstem at Virginia Loop Rd., approximately 30ft. below culvert	420	92	940	200	80	65	10	44	18	51	2	8	1	6	1	5	16	1	940	23	329	
Perry Creek																								
15-PER-0.1	17	Mainstem at 90 deg. right turn in Thorpe Rd. upstream side of culvert	530	550	69	77	80	9	71	3	17	220	23	26	29	74	77	200	16	3	550	58	350	
Sam Snyder Creek																								
15-SAM-0.1	18	Mainstem at Lemolo Shore Dr., downstream side of culvert (dry during dry season)	-	-	-	-	-	-	20	3	13	54	1	1	22	21	3	6	10	1	54	7	42	
Lemolo Creek																								
15-LEM-0.1	19	Mainstem at Lemolo Shore Dr. east of Delate Rd. Access from first private drive east of creek, 75 ft. upstream of culvert	84	77	3	7	18	22	2	6	5	150	21	6	7	5	1	6	16	1	150	10	60	
Bjorgen Creek																								
15-BJO-0.1	20	Mainstem at Lemolo Shore Dr. by market, downstream side of culvert	3000	140	49	190	140	21	120	6	5	1100	14	6	27	53	6	7	16	5	3000	44	531	
Barrantes Creek																								
15-BAR-0.0	21	Mainstem at Lemolo Shore Dr. downstream of culvert. Sample at low tide	450	190	810	190	270	20	110	13	3	90	4	27	8	11	12	1	16	1	810	34	421	
Unnamed Tributaries to Liberty Bay																								
15-UNN-0.1	22	Trib. east of Daniels Ck. at Hwy 308 near "Support Our Troops" sign. 30ft. upstream of culvert	29	40	-	-	29	15	100	3	4	110	14	1	11	8	4	7	14	1	110	13	70	
15-UNN-0.0	23	Trib. flowing into bay right next to Daniels Ck. mouth. Sample at low tide.	-	-	-	-	-	77	180	63	330	180	10	3	9	39	2	1	11	1	330	23	301	

Table 2. Fecal coliform (colony forming units per 100 mL) at investigatory and dry-period survey sites in the Liberty Bay watershed. Yellow highlighted values do not meet Washington State surface water quality criterion. Dashes denote no sample taken.

Site ID w/ stream mile	Site description	Aug 12	Aug 26	Sept 10	Sept 24	Oct 8	Oct 22	Nov 11	Nov 24	Dec 10	Dec 29	Jan 14	Jan 28	Feb 11	Feb 25	Mar 11	Mar 24	Oct 29	
"Dry storm" synoptic sampling survey																			
15-LEM-0.0	Lemolo Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47
15-BJO-0.0	Bjorgen Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260
15-BAR-0.0	Barrantes Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43
15-DOG-0.0	Dofish Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
15-JOH-0.0	Johnson Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
15-BSC-0.0	Big Scandia Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51
15-LSC-0.0	Little Scandia Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5600
15-PER-0.0	Perry Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
15-DAN-0.0	Daniels Creek mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220
15-UN1-0.0	15-UNN-0.1 mouth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	470
15-UNN-0.0	Trib. flowing into bay south of and next to Daniels Ck. mouth.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
15-UN3-0.0	Small, unnamed stream flowing into Dogfish Bay, east of station 15-UNN-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71
15-UN4-0.0	Small stream flowing through Fish Park into Dogfish Creek near mouth, below 15-DOG-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
15-JEA-0.0	Small, unnamed stream flowing into the bay near American Legion Park (Poulsbo outfall PSW31)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
Investigatory sites																			
15-PET-0.0	Trib. east of Perry Ck. at Thorpe Rd. Sample at low tide above culvert. Dry during dry season	-	-	-	-	-	89	-	-	160	110	8	86	26	190	3	64	-	-
15-JEA-0.0	Small, unnamed stream flowing into the bay near American Legion Park. Poulsbo outfall ID is PSW31	-	-	-	-	-	-	150	75	82	1300	3	220	69	1000	1	7	-	-
15-DON-0.0	"Donna Jean's Creek" at Poulsbo Yacht Club	-	-	-	-	-	-	-	-	-	370	11	1	21	140	8	13	-	-
15-STORM-1	Storm drain at the south end of American Legion Park. Below the Gran Kirk, Martha and Mary, and Front St. Poulsbo outfall PSW30.	-	-	-	-	-	-	1500	-	-	880	-	-	-	160	-	-	-	-
15-STORM-2	next storm drain north of STORM-1 (metal culvert)	-	-	-	-	-	-	-	-	-	1100	-	-	32	2100	-	-	-	-
15-UN3-0.0	Small, unnamed stream flowing into Dogfish Bay, east of station 15-UNN-0.1	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-	-	-	-
15-BST-0.0	Small unnamed seasonal stream flowing into Liberty Bay ~300 feet east of Big Scandia Creek.	-	-	-	-	-	-	-	-	760	200	60	11	110	230	88	8	-	-
15-KE1-0.2	Keyport Ck (1st trib. at Brownsville Hwy)	-	-	-	-	-	-	-	-	-	-	23	-	-	51	-	1	-	-
15-KE2-0.3	Keyport Ck (2nd trib. at Brownsville Hwy)	-	-	-	-	-	-	-	-	-	-	2	-	-	6	-	10	-	-
15-JOH-T	Trib. to Johnson Creek above 15-JOH-0.1	-	-	-	-	-	-	-	-	-	3	150	-	-	-	-	-	-	-

Figures

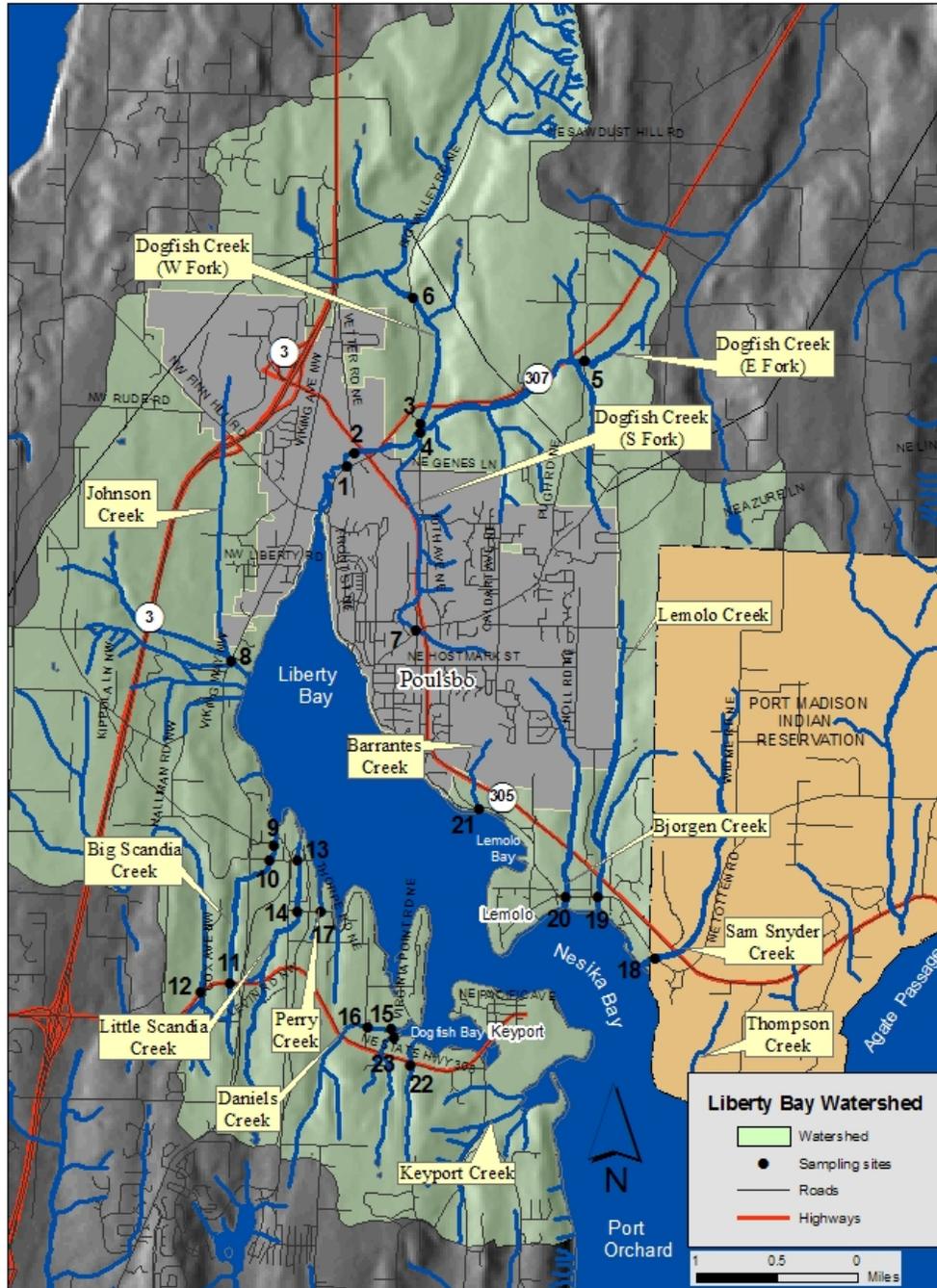


Figure 1. Map of Liberty Bay and Nesika Bay watersheds, including tributaries to Agate Passage and Port Orchard Bay. Numbers reference Table 1.