

DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
Quarterly Report

January 20, 2009

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SUBJECT: Liberty Bay Tributaries Fecal Coliform TMDL Quarterly Report

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 first in a series of four quarterly reports that summarizes project progress from August 2008 through mid-December 2008. All data presented are provisional; data quality has not yet been checked.

Progress to Date

All comments for the draft Liberty Bay TMDL Quality Assurance Project Plan (QAPP) have been addressed and the final QAPP will be posted to the web in January 2009.

Data Collection

- Collected 20 to 27 membrane filtered FC samples during each of the nine surveys completed from August to mid-December 2008. Several investigatory sites were also sampled one to three times (Tables 1 and 2).
- Installed staff gages in Dogfish, Big Scandia, Little Scandia, and Perry Creek subbasins, as well as at an unnamed creek flowing into Dogfish Bay east of Daniels Creek (15-UNN-0.1).
- 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.
- A dry-period synoptic sampling event (“dry storm” event) was conducted in late October to estimate total low flow loading to the bay over the course of one day. All flowing creeks and outfalls were sampled at their mouths, except Donna Jean’s Creek near the Poulsbo Yacht Club (Poulsbo outfall PSW25), Thomas Creek, and Keyport Creek. FC concentration results are listed in Table 2.
- 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 results for all FC samples collected from August through mid-December and compared the preliminary data to Washington State Surface Water Quality Standards (WAC-173-201A). Ecology detected violations of the geometric mean criterion at 11 of the fixed-network sites and violations of the 90th percentile criterion at 17 of the fixed network sites (Tables 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) may be moved farther downstream to capture any influence from a small tributary that flows into Johnson Creek approximately 200 feet downstream of the current site.
- 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 February 2009.
- A meeting is scheduled with the city of Poulsbo to present the Quality Assurance Project Plan and other ongoing activities with the Liberty Bay TMDL in February 2009.
- The next quarterly report will be available in April 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.

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	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	9	21	110	54	104
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	9	9	360	57	301
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	9	8	330	69	267
15-EFD-0.0	4	East fork at Little Valley Rd., downstream side of culvert	180	80	51	34	220	92	51	4	10	9	4	220	47	246
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	9	3	67	17	75
15-WFD-0.0	6	West fork at Little Valley Rd., downstream side of culvert	75	180	110	31	18	18	43	45	23	9	18	180	44	125
15-WFD-0.9	7	West fork at first Big Valley Rd. crossing near Living Waters Farm	57	80	19	28	13	18	37	30	17	9	13	80	28	60
Johnson Creek																
15-JOH-0.1	8	Mainstem just south of Norfin Ln., downstream side of culvert	8	120	4	140	220	2	11	1	1	9	1	220	11	173
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	9	3	180	38	182
15-BSC-0.1	10	Mainstem at Scandia Rd, upstream side of culvert	79	110	36	35	88	20	6	2	44	9	2	110	28	152
15-BSC-1.1	11	Mainstem at HWY 308 between Viking Way and Cox Ave., downstream of culvert	35	110	6	10	40	7	11	2	1	9	1	110	10	69
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	9	1	88	17	129
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	9	46	1600	232	1149
15-LSC-0.4	14	Mainstem at Blomster Way, upstream side of culvert	920	150	260	640	180	160	41	3	6	9	3	920	92	1149
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	9	15	590	117	790
15-DAN-0.2	16	Mainstem at Virginia Loop Rd., approximately 30ft. below culvert	420	92	940	200	80	65	10	44	18	9	10	940	87	553
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	9	3	550	54	497
Sam Snyder Creek																
15-SAM-0.1	18	Mainstem at Lemolo Shore Dr., downstream side of culvert (dry during dry season)	-	-	-	-	-	-	20	3	13	3	3	20	9	33
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	9	2	84	11	64
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	9	5	3000	70	873
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	9	3	810	88	937
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	7	3	100	18	90
15-UNN-0.0	23	Trib. flowing into bay right next to Daniels Ck. mouth. Sample at low tide.	-	-	-	-	-	77	180	63	330	4	63	330	130	349

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.

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	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	-
15-JEA-0.0	Small, unnamed stream flowing into the bay near American Legion Park. Poulsbo outfall ID is PSW31	-	-	-	-	-	-	150	75	82	-
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	-	-	-
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	-
15-JOH-T	Trib. to Johnson Creek just below 15-JOH-0.1	-	-	-	-	-	-	-	-	3	-

Figures

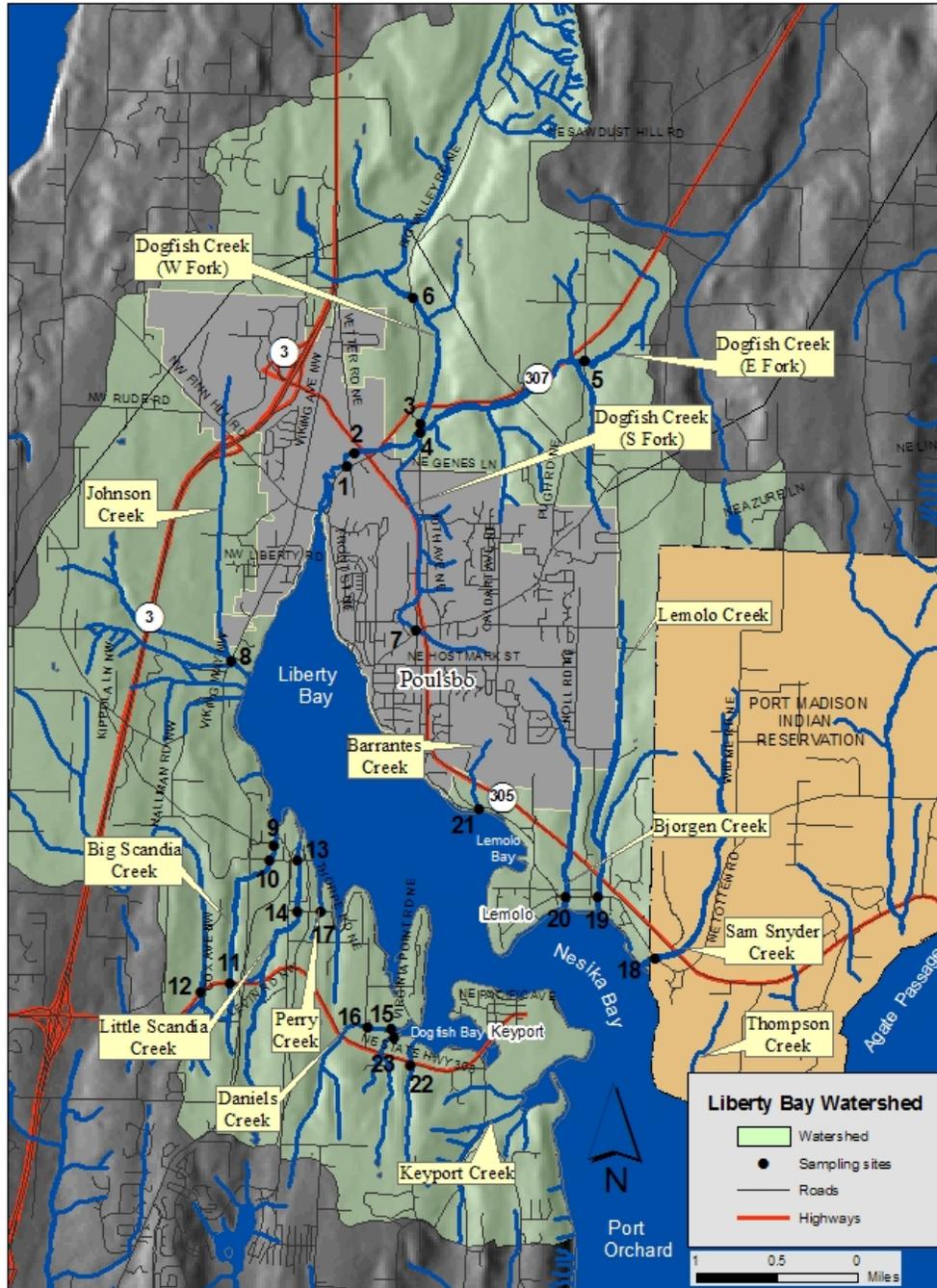


Figure 1. Map of Liberty Bay and Nesika Bay watersheds, including tributaries to Agate Passage and Port Orchard Bay. Numbers reference Table 8.