DRAYTON HARBOR SHELLFISH PROTECTION DISTRICT
Special Subcommittee Meeting Agenda

Date: October 28, 2021
Time: 2:30-4:00pm
Place: **Zoom Meeting** https://us06web.zoom.us/j/83532884195

Agenda

Drayton Harbor SPDAC- Recovery Plan Update: Monitoring Section		
1.	2:30	Introductions
2.	2:35	Public Comment
3.	2:40	Water Quality Patterns- Discussion
4.	3:00	Status of Drayton Harbor TMDL
5.	3:10	Salish Sea Circulation Model
6.	3:15	Wet Season Monitoring Questions
7.	3:20	2007 Recovery Plan Recommendations Discussion
8.	4:00	Adjourn

2007 Drayton Harbor Shellfish Recovery Plan

Objective Two
Identify Pollution Sources and Monitor Water Quality

Bacterial water quality monitoring in the Drayton Harbor watershed, funded by various programs, has been ongoing, though sometimes only sporadically, since 1997. It has been under the guidance of several groups, including:

- **Port of Bellingham.** The Port has contracted with Hirsch Consulting Services (HCS) since 1997 to monitor water quality in Blaine Harbor. In spite of repairs to the Blaine sanitary sewer system, bacterial pollution in the harbor remains high. All monitoring stations in the commercial area have violated both parts of the DOH shellfish standard (geometric mean less than 14 colonies/100ml and 90th percentile less than 43 colonies/100ml). All stations in the recreational area have violated the second, less forgiving part of the standard. These data have also revealed a seasonal pattern with the highest concentrations occurring in the fall/winter and late summer and the lowest in the spring. In addition, higher fecal coliform (FC) loading occurs in the commercial portion of Blaine Harbor than in the recreational area, suggesting a FC source in the commercial area.

  Camera inspections and dye studies have failed to identify a source of FC loading in or near the commercial marina. High FC bacteria counts during some rainfall events coupled with historic observations of bird congregations on building roofs shifted the focus to wildlife sources. In the summer of 2003, the Whatcom County Marine Resources Committee (MRC) conducted a bird count and, during the winter of 2003-04, the County contracted with PSRF and HCS to conduct stormwater monitoring at roof and storm drains in the commercial area of the marina. Bird counts and stormwater fecal coliform data indicated that runoff co-mingled with accumulated bird feces is a source of FC loading to Blaine Harbor. In 2004, the MRC and the Port installed stormwater planters at the rooftop drains of the building with the highest bird counts to assess the effectiveness of this stormwater best management practice. Samples were collected at the stormwater planter installation sites and at stormwater outfalls to Blaine Harbor during three storm events before and three storm events after installation. While the average observed FC removal rate was 50%, there was no statistically-significant

difference in FC means or loading between pre- and post-installation values.

As of 2005, results for all sample stations within the commercial portion of Blaine Harbor continued to exceed the water quality standard. The Port's routine water quality monitor program in Blaine Harbor, though much abbreviated compared to previous years (now summer months only vs. monthly sampling through 2005) will extend through 2010 per requirements of a moorage expansion project. *Annual cost for summer months only marine sampling: $5,000.*

- **Washington State Department of Health (DOH)**. Marine water quality sampling at 11 sites in Drayton Harbor has been conducted by the DOH Shellfish Program on a bi-monthly basis since 2000. In spite of no mandate to monitor "Prohibited" areas like Drayton Harbor, DOH has made a commitment to continued monitoring in the harbor. In 2004, DOH reclassified portions of Drayton Harbor to "conditionally approved" with closures occurring after rainfall events greater than or equal to 0.5 inch in 24 hours. In that same year, PSRF began conducting wet weather marine sampling to provide additional data for use in supporting an increase in the rainfall threshold that triggers growing area closures. These data resulted in the 2006 revision of the closure level to greater than or equal to 0.75 inch of rain in 24 hours. Currently, five sampling sites meet the water quality standards for harvest under low rainfall conditions, but not high (four of these sites are in the conditionally approved portion of the harbor). Three sites meet the water quality standards under all conditions, while three sites exceed the standards regardless of rainfall conditions.

- **Northwest Indian College (NWIC).** NWIC has been sampling freshwater stations in Dakota and California Creeks on a bi-weekly or monthly basis since 1999. They have also sampled three high-priority storm drains that discharge from east Blaine into both Drayton Harbor and Semiahmoo Bay. Fecal coliform concentrations in both creeks steadily declined from 1999 through 2003, but have risen since then. All sites still meet the geometric mean water quality standard, but have exceeded the 10% of samples greater than 100 FC/100 mL portion of the standard. Fecal coliform concentrations are significantly higher in the storm water discharges in east Blaine (90^{th} percentile calculations range from 409 to 877 colonies/100ml). These levels exceed standards for freshwater. Results of this work may be used to locate retrofitted storm water treatment facilities in Blaine and identify other potential sources of high bacterial levels. This program has been reduced due to expiration of grant funds. Whatcom County Public Works funded monthly sampling at 10 sites in 2006 and 2007. *Annual cost for monthly sampling at 10 stations: $5,600.*

- **Blaine Seafood Processors**. Fecal coliform concentrations in fish processing wastewater, which discharges to the mouth of Drayton Harbor, have declined significantly in 2002 and 2003 compared to previous years. Following extensive remedial sanitation actions, bacteriological quality in wastewater has improved from a fecal coliform geometric mean of 397 in 1999 to 10 in 2003. These levels have continued to remain low through 2006. *Annual cost for routine sampling: $11,000*

- **RE Sources' Countywide Pledge Program**. PSRF and Hirsch Consulting partnered to sample urban and rural storm water runoff from East Blaine (California Creek mouth northward to Marine Drive) during the late summer and winter season for two consecutive years beginning in the summer of 2002. Fecal coliform (FC) densities for this project ranged from < 1-3,040 colonies/100 mL. Geometric means ranged from 13-238 colonies/100 mL and the percentage of samples at each site exceeding 200 FC/100 mL ranged from 8-58%. Two of 10 sampling stations exceeded the Washington State Class A Water Quality Standard for the FC geometric mean (100 colonies/100 mL) and 8 of 10 stations failed to meet part two of the fecal coliform standard (where no more than 10% of samples shall exceed 200 colonies/100 mL). Fecal coliform loading estimates were correlated with 4-day rainfall at 6 out of 10 sampling stations. At most sampling stations, peaks in loading coincided with 4-day rainfall greater than 1.00 inch. Fecal coliform bacteria densities were higher for urban versus rural stations ($p<0.10$), however loading estimates were significantly higher for rural stations ($p<0.05$) due to greater flow volumes.

  The sum of the mean daily loading estimates for all project sampling stations was 6.94E+10 as compared with daily loading estimates for California Creek (7.10E+09) and Dakota Creek (4.49E+10), (NWIC, 2004), (Landau Associates, 2001). While it appears unlikely that any individual drainage sampled impacts fecal coliform levels at shellfish growing areas, taken together the loading potential of the smaller drainages appears comparable to one of the larger creeks. This sampling program has identified two high priority urban storm drainages that should be considered for retrofitting a treatment system that will help reduce fecal coliform bacteria before discharge to Drayton Harbor. *Annual cost for monthly stormwater sampling at ten sites, 6 months/year: $10,000.*

- **Whatcom County Stormwater Division.** Special shellfish project funding supported five water quality monitoring projects in 2006. These include:
  - See NWIC monitoring above.
  - Tributaries to California Creek are being sampled quarterly and during six storm events for fecal coliform bacteria

and stream flow. This information will be used to estimate bacteria loading from ten sub-drainages and identify priority areas for follow-up actions. *Project Cost: $19,90*0

- A microbial source tracking study in Drayton Harbor and the California Creek watershed conducted by Whatcom County, PSRF, DOH, and EPA to differentiate human, bovine, and equine sources of fecal coliform contamination. Freshwater and marine samples will be collected during five events between November 2006 and April 2007 and sent to the Institute of Environmental Health and the EPA Manchester laboratory for PCR and ribotyping analysis. Results of this study will be used to develop targeted source control programs in the watershed. *Cost to County: $20,530. Cost to other partners: PSRF, $8,000 and Trillium, $8,000.* ***Total project cost: $36,000***
- Marine wet weather sampling during rainfall closures is being conducted by PSRF from spring 2006 through spring 2007. The intent of this program is to determine if the harvest closure threshold can be adjusted upward from 0.75 inches to 1.00 inches in 24 hours. *Cost to County: $3,900*
- In 2006, Whatcom County staff conducted an optical brightener (OB) study in the California Creek and Tenmile Creek watersheds to assess human-caused fecal coliform contamination in these water bodies. OBs are whitening agents added to most laundry detergents. Since they are not naturally occurring in the environment, their detection in streams indicates the presence of domestic wastewater due most likely to on-site septic system leaks, direct discharges, cross connections, or sewage leaks. Whatcom County contracted with Herrera Consultants and HCS to conduct a larger OB study in the California Creek watershed in 2006-07. Results of these studies will be used to develop targeted source control programs. *Project Cost:$8,010.*

- **Whatcom County Marine Resources Committee (MRC).** In 2006, Whatcom County hired Hirsch Consulting to develop a monitoring plan for sampling freshwater inputs to Drayton Harbor, Birch Bay, and Chuckanut Bay and to train volunteers to perform sample collection. Stream flow measurements and samples for fecal coliform analysis are obtained monthly. This project began in June 2006 and is anticipated to continue through June 2009. Data are used to assess fecal coliform loading and to inform citizens about the need for clean marine waters for safe shellfish harvesting. *Annual Cost: $8,000*
- **Washington State Department of Ecology (DOE).** In 2006, a TMDL study for the harbor was initiated, which will add another dimension to monitoring efforts in the basin. The federal Clean Water Act requires water bodies that fail to meet water quality standards undergo a Total Maximum Daily Load (TMDL) study. This process includes identifying pollutants and sources, estimating the pollutant reduction required to attain water quality goals, and developing source control strategies. DOE included Drayton Harbor on the 2006 303(d) list as a priority water body and is conducting a TMDL study for fecal coliform bacteria.

Recommendations

Within this section of the plan, some tasks are identified as "Special Projects." These projects are short-term monitoring projects that will be designed to answer specific questions related to source identification and pollutant reduction.

2A: Develop and fund a coordinated water quality monitoring program to identify pollution sources and to track changes in water quality.

High Priority

A Coordinated Water Quality Monitoring Framework for the Drayton Harbor Shellfish Protection District was written by Hirsch Consulting Services in January 2000. This plan called for:

- Long term funding administered by a lead agency
- Development of a Quality Assurance Plan
- Establishment of partnerships in the form of an MOU between participating agencies regarding data sharing, sampling coordination, and reporting of results.

Whatcom County Stormwater has been compiling Drayton Harbor watershed water quality data from the various entities working in the watershed. Coordination of this data can assist with evaluating trends and identifying potential sources of fecal coliform bacteria. To date, none of the monitoring programs have any dedicated long-term funding source and the January 2000 Coordinated Water Quality Monitoring Framework has not been fully implemented. A work group began meeting in spring 2005 to review, update, and implement a coordinated water quality monitoring program.

Recommendation: The Committee supports continued work to update and implement the coordinated monitoring program. A long-term sustainable source(s) of funding to coordinate and implement the coordinated monitoring program should be identified. ***Committee is requesting $50,000 per year to support this recommendation.***

2B: Increase capacity for following up on monitoring findings.

High Priority

Currently there is no formal mechanism for follow-up investigation of fecal coliform spikes that are observed during regular

monitoring activities.

Recommendation: The Committee recommends the development of a systematic approach to investigate causes of high fecal counts in fresh water bodies observed through monitoring. The approach could include activities such as an initial field visit. If the source is suspected to be related to on-site septic systems, the findings would be relayed to Whatcom County Health; violations of the Critical Areas Ordinance would be relayed to Whatcom County Planning and Development Services; issues related to commercial farms would be relayed to the Washington State Department of Agriculture. Field visits as well as results from further investigations by other agencies would be logged and reported to the Committee at its regular meetings.

In situations where a fecal source is not readily apparent, special monitoring may be required. The Committee recommends allocating funds toward this purpose. ***The committee is requesting $75,000 per year for 1 FTE to perform follow-up investigations in problem drainages, initial landowner contact and education, and coordination with other local agencies for technical support.***

2C: Develop and implement a long-term monitoring strategy with baseline sites and parameters identified.
High Priority
An important component to a water quality monitoring program for the Drayton Harbor Shellfish Protection District is long-term, baseline data. Long-term data using consistent locations, parameters, and methods help identify patterns in water quality, focus pollutant reduction efforts, and evaluate the effectiveness of implemented strategies.

Recommendation: In coordination with 2A, a long-term monitoring strategy for the Drayton Harbor watershed should be developed. This strategy will include ambient monitoring stations, parameters, and standard protocols for baseline monitoring. Until the time that this program in established and implemented, continue monthly tributary sampling through current NWIC program.

2D: Special Project: Increase the frequency and locations of water quality sampling in Dakota and California Creeks.
High Priority
Portions of Drayton Harbor are now *Conditionally Approved* for harvest, with restrictions based on rainfall. In order to upgrade these areas to *Approved*, the specific drainages and sources responsible for high fecal counts during storm events must be identified and addressed. A monitoring strategy to address these concerns would involve regular sampling at multiple tributary sites and intensive wet-weather sampling.

Recommendation: The Committee recommends continuing the special project monitoring in California Creek and the development of a monitoring strategy for Dakota Creek involving increased tributary samples to help identify potential bacteria sources. The Whatcom Conservation District's assistance should be requested in identifying drainages that are likely to be contributing to high fecal counts during storm events.

2E: Special Project: Conduct Phase 2 of microbial source tracking in the Drayton Harbor watershed.
High Priority
Phase 1 of the MST study is a pilot project that consists of data collection at five sites in the watershed over five months, beginning in November 2006. Data collection for Phase 1 will conclude in spring 2007, with results expected in the late summer or early fall.

Recommendation: If feasible, statistically-reliable, and cost-effective, the Committee supports initiating Phase 2 of this project, which would expand MST efforts to the entire watershed and would identify prominent sources of fecal coliform bacteria (initially human vs. animal; secondarily, presence of bovine *E. coli*) in California and Dakota Creeks and in the marine waters of Drayton Harbor.

2F: Special Project: Conduct wet-weather monitoring in the harbor.
High Priority
Currently, portions of Drayton Harbor have a conditional approval for shellfish harvest. This approval is based upon 0.75 inches of precipitation in a 24-hour period. Rainfall events greater than 0.75"/24hrs result in a five-day closure. Additional monitoring in the harbor during or immediately following rain events may result in an adjustment of the conditional approval criteria and result in more available days for harvesting within the year. This special project concludes in spring 2007.

Recommendation: Pending final results, the Committee recommends continuing the wet-weather monitoring program in the harbor to further evaluate the impact of rain events on water quality within the harbor.

2G: Encourage continued monitoring of water quality at a reduced number of stations and frequency within Blaine Harbor.

High Priority
The Water Quality Certification/Modification associated with the Port of Bellingham's marina expansion required a water quality monitoring plan to establish baseline water quality in the marina prior to the project and provide long-term monitoring during the operation of the marina. The long-term monitoring program requires, at a minimum, a full year of sampling with a monthly frequency in years 1, 3, 5, and 10. Monitoring during the off years may or may not be warranted depending on the results of the monitored years. Data collected by the Port to address these requirements have been helpful in evaluating potential sources of bacteria in the marine waters. The Port shares this data with Whatcom County for incorporation into the larger database.

Recommendation: The Committee encourages the Port's continuation of water quality monitoring in the Blaine marina. This data collection effort should be coordinated with other monitoring efforts in the harbor and watershed. The Committee also supports the recommendations made in the 2005 Blaine Harbor Water Quality Monitoring Summary report:
1. Development of BMP standards to address boaters' sewage treatment management; periodic routine inspection of recreational and commercial vessels to ensure proper operations of sanitation devices; and ensure vessels follow pump out procedures
2. Explore approaches to prevent build-up of bird feces on docks, floats, and rooftops
3. Re-evaluate the long term monitoring plan with permitting agencies to determine if quarterly sampling (to include the wet season) could yield better sampling data; consult with DOH to develop a reporting strategy for sewage discharges to Blaine Harbor.

2H: Special Project: Conduct circulation studies of Drayton Harbor.
Low Priority
Section C of the *National Shellfish Sanitation Program Manual* requires a "review of hydrographic factors that may affect distribution of pollutants." In 2000, there had been minimal study of circulation patterns in Drayton Harbor. Since that time, a circulation study of Semiahmoo Bay was conducted by Hay and Company (through a cross-boundary partnership). This study included Drayton Harbor, but the resolution of the study was coarse. In 2003, Whatcom County contracted with the PSRF and DOH to design and conduct a series of circulation studies to improve the understanding of how water is exchanged from the commercial portion of Blaine Harbor with surrounding marine waters. This series of studies revealed that there is little if any exchange of surface waters from Blaine Harbor to surrounding waters during the ebb tide; however, it appears that deeper water does exit Blaine Harbor during the ebbing tide. Based on these studies, it appears that fecal coliform-contaminated surface water from inside Blaine Harbor has little if any impact on water quality in most of Drayton Harbor. *Cost to County: $2,000*

Recommendation: While these studies have provided some valuable information about circulation patterns, the Committee believes additional studies may be warranted to help further identify sources of bacteria in the system.

2I: Continue to update the 2004 report titled "Tracking Reports and Projects of Potential Pollution Sources in the Drayton Harbor Watershed, 1991-2003."
Low Priority
In spring 2004, Geoff Menzies, the Committee chair, and Katie Callahan, Whatcom County Water Resources, developed an annotated bibliography of reports and projects regarding potential pollution sources in the Drayton Harbor watershed.

Recommendation: The Committee supports an annual update that includes new projects and studies.