Whatcom County 2011 Water Quality Report and Priority Areas
Fecal Coliform in Coastal Drainages

Introduction

Purpose

Whatcom County employs water quality monitoring, priority area ranking, pollution source identification, community education, technical and financial assistance programs, and regulatory enforcement to protect public health and prevent pollution of surface waters. These activities protect and improve the quality of water where we live, work, and play.

Whatcom County is enhancing its Pollution Identification and Correction (PIC) Program for fecal coliform bacteria that includes an annual review of routine monitoring sites located throughout the county. Two key components of the enhanced program are a comprehensive monitoring and drainage ranking program and an active community engagement strategy. Restructuring these components will help characterize the current status of watershed health and associated public health threats, focus limited county resources on the areas that will most benefit from water quality improvement efforts, and engage landowners in community solutions.

Currently, Whatcom County Public Works (WCPW) monitors fecal coliform and other water quality parameters at approximately 90 stations on at least a monthly basis. Sample collection is conducted following standard protocols by trained staff, contractors, and volunteers (WCPW 2009). These data assist the County Health Department, County Planning and Development Services, and other agencies to identify sources of bacterial pollution that threaten public health.

In past years, results from monthly sampling runs were compared with threshold bacteria levels established in the High Bacteria Response Strategy (WCPW 2008). Follow up actions were determined based upon land use activities, potential pollution sources, and department and agency jurisdictions. In practice, this scattershot approach led to resources spread too thinly across the county as staff responded to single incidents of high counts in different watersheds each month.

An alternative and more effective approach has been deployed by Kitsap County that is now held as a model for the Puget Sound region. The enhanced Whatcom County PIC Program builds off several elements of the Kitsap program. These are routine monitoring, annual review and ranking of drainages, and initial voluntary interactions with landowners to identify pollution sources and provide tools to help improve management practices that may be impacting water quality. The annual review and ranking of drainages will focus pollution prevention efforts in areas that have most consistently shown high bacteria counts.

This annual report summarizes Whatcom County's bacterial water quality concerns, outlines the routine monitoring program, characterizes the current status of water quality at each monitoring station, prioritizes areas for water quality improvement projects, and describes the areas where Whatcom County will be focusing efforts in the next year.

Fecal Coliform in Whatcom County Waters

Water Resource Inventory Area (WRIA) 1 is located in the northwest corner of Washington State and encompasses most of Whatcom County and a small portion of Skagit County. Since 1998 a variety of water resource management stakeholders, local and state agencies, and tribal governments have worked together under the Watershed Management Act to characterize issues related to water

quantity, water quality, fish habitat, and instream flows as well as to identify potential management solutions. The characterization completed in 2005 found fecal coliform to be the predominant water quality issue in Whatcom County based upon 303(d) listings. Of the 274 individual 303(d) listings for WRIA 1 in 1998, 82 were for fecal coliform, while the next most frequent, dissolved oxygen, had 48 listings. In 2008, there were 253 individual Category 5 303(d) listings for water in WRIA 1. Sixty-six of these Category 5 listings were for fecal coliform and listings for dissolved oxygen increased to 106.

Continuation of this widespread problem of elevated fecal coliform in Whatcom County waters is illustrated by the WCPW routine monitoring program data, recurring shellfish harvest closures, and recent public health advisories. Of the 84 freshwater stations with at least three years of data, only 16 (less than 20%) meet water quality standards for fecal coliform (Appendix A). Elevated bacteria levels in marine waters have led to the establishment of three shellfish protection districts in Whatcom County: Drayton Harbor, established in 1995, Portage Bay, established in 1998, and Birch Bay, established in 2009.

Drayton Harbor historically supported non-tribal commercial, tribal commercial, ceremonial, and subsistence harvests, and recreational shellfish harvesting. The harbor has been at the top of the Washington State Department of Health (DOH) Fecal Pollution Index (FPI) list for over 10 years. Although water quality improvements led to upgrades in portions of the harbor to Conditional Approval in 2004 and 2010, the community is now tackling the harder non-point sources in an effort to regain full Approved status for the entire area.

Portage Bay supports commercial, ceremonial, and subsistence shellfish harvest for members of the Lummi Nation. Portions of the Portage Bay shellfish growing area were re-opened in 2003 and the remaining closed areas were reopened in 2006; however, starting in 2004 fecal coliform levels in the mainstem of the Nooksack River began increasing again. In the past two years, the geometric mean of the mainstem site located at Marine Drive (M1) has doubled. While the levels are still meeting water quality standards, this substantial increase creates concern for the potential impact on the shellfish growing area status. Due to elevated bacteria levels, 2 of 12 marine monitoring stations in Portage Bay were described as threatened and 4 of 12 were described as sites of concern in DOH's 2011 Annual Growing Area Review.

Birch Bay is a large draw for recreational shellfish harvesters, including both locals and tourists. Birch Bay State Park has consistently been one of the top recreational shellfish areas of the state. The shellfish growing area within an area around the mouth of Terrell Creek was downgraded to Prohibited in 2008 due to elevated levels of fecal coliform bacteria in the creek. Current fecal coliform levels in Terrell Creek are not as high as have been historically documented; however, several tributaries and the majority of coastal drainages discharging to the bay exceed both parts of the water quality standard for fecal coliform.

Northern Chuckanut Bay (Mud Bay) has been closed for recreational shellfish harvest since 1994 due to elevated bacteria levels and on-site sewage system (OSS) findings. In 2011, Wildcat Cove in Larrabee State Park was posted with a swimming advisory due to elevated bacteria levels. These advisories and closures are included in the *Whatcom County Fecal Coliform Levels and Shellfish Growing Area Status* map (Appendix B).

Sources of Fecal Coliform Water Pollution

The primary cause of pollution in Whatcom County's creeks and marine waters is nonpoint source pollution. Nonpoint source pollution is the term used to describe pollutants that come from many smaller sources, rather than a few large sources. This accumulation of pollutants often results from common activities in both urban and rural areas.

Although there are many types of water pollutants, Whatcom County focuses on fecal coliform bacteria as our primary indicator of surface water quality. Fecal coliform bacteria is found in human and animal feces. While most fecal coliform strains do not cause human illness, detection in a creek or bay do indicate that human and/or animal wastes and the associated harmful pathogens are polluting the water. Examples of pathogen-related illnesses are giardia, salmonella, viral gastroenteritis, hepatitis, and cholera. People are exposed to these pathogens through direct water contact, such as swimming, wading, or eating shellfish from waters with high bacteria levels.

The key potential sources of bacteria that have been identified in Whatcom County coastal drainages are (1) **animal waste** from agricultural operations, domestic pets, waterfowl, and urban wildlife and (2) **human sewage** from failing on-site sewage systems (OSS), leaking sewers, or cross-connections

Water Quality Program

Water Quality Monitoring Goals

Whatcom County conducts routine water quality monitoring to meet the following goal and objectives relating to protecting and improving the quality of surface waters.

Goal:

- Reduced fecal coliform levels at priority drainages to meet applicable water quality standards and support human health, recreational uses, animal health, and shellfish harvest.

Objectives:

- Assess surface water quality status and trends through long-term monitoring.
- Compare results against applicable standards.
- Prioritize hot spots for water quality improvement projects (both within the county and within a specific creek).
- Identify public health concerns.
- Identify potential sources of bacteria.
- Provide water quality data to the public and other interested parties.

Washington State Water Quality Standards

Table 1 lists water quality standards for fecal coliform bacteria at marine and freshwater sites in Whatcom County coastal drainages. The Lummi Nation has similar water quality standards for the Lummi Indian Reservation but these waters are monitored by the Lummi Natural Resources Department. The water quality standards that govern Whatcom County are established and regulated by the Washington State Department of Ecology and approved by the U.S. Environmental Protection Agency. They are described more fully in Chapter 173-201A of the Washington Administrative Code (WAC).

Table 1. Department of Ecology Water Quality Standards for coastal drainages.

Marine Water Standards	Freshwater Standards	Freshwater Standards
All Areas	Extraordinary Primary Contact Cain Creek, Birch Bay watershed	Primary Contact Nooksack, Drayton, and Chuckanut watersheds
• Geometric Mean- 14 FC/100mL • Estimated 90th Percentile- 43 FC/100mL	• Geometric Mean- 50FC/100mL • Not more than 10% exceed 100 FC/100mL	• Geometric Mean- 100FC/100mL • Not more than 10% exceed 200 FC/100mL

Routine Monitoring

WCPW coordinates regular monitoring of fecal coliform levels at approximately 90 sites in county watersheds that discharge to marine waters. Water samples are collected by WCPW staff, Northwest Indian College (NWIC) staff, Washington Conservation Corps (WCC) crew members, and trained Marine Resources Committee (MRC) volunteers. Field teams are trained in sampling, storage, and lab delivery protocols. All samples are analyzed at Department of Ecology certified laboratories using standard methods for fecal coliform analysis. Quality control steps are used to measure variability due to sampling methods and conditions. Results are compared against data quality objectives to measure precision of results. Sampling events are pre-scheduled, typically at least a month in advance, and provide data from a broad spectrum of environmental conditions throughout the year. During some seasons, samples are unable to be collected due no flow or tidal conditions. Water quality data are used to prioritize drainages for pollution identification and control projects and to characterize general patterns in declining and improving water quality. The WCPW staff coordinates with County Health, County Planning and Development Services, and State departments of Agriculture and Ecology to respond to drainages where elevated bacteria levels are consistently observed.

Data Quality Objectives

The various fecal coliform monitoring programs coordinated by Whatcom County include collection of field duplicates for 10% of the samples. For example, eight samples would require one field duplicate and fourteen samples would require two field duplicates. Field duplicates are collected immediately after the original sample in the same location. Precision of the field duplicates are evaluated in terms of relative standard deviation (RSD). The data quality objectives are 1) not more than 50% of duplicates have a RSD of greater than 20% and, 2) not more than 10% of duplicates have an RSD of greater than 50%. As summarized below, fecal coliform data collected over the last three years were compared to the data quality objectives for Drayton Harbor, Birch Bay, Portage Bay, and Coastal Drainage routine monitoring programs.

Drayton Harbor Watershed (WCPW)

From 2009 through 2011, there were 36 sampling events in the Drayton Harbor routine monitoring program conducted by WCPW staff. Field duplicates were collected for 10% of the samples. Approximately 5% had a RSD of greater than 50% and about 36% had a RSD of greater than 20%. These RSDs meet the data quality objectives listed above.

Birch Bay Watershed (WCPW)

From 2009 through 2011, there were 62 sampling events in the Terrell Creek/Birch Bay routine monitoring program conducted by WCPW staff. Field duplicates were collected for 10% of the samples.

Approximately 12.8% had a RSD of greater than 50% and about 40% had a RSD of greater than 20%. These field duplicates meet the data quality objectives for RSDs greater than 20%, but are slightly greater than the objectives for RSDs greater than 50%. Most duplicates with RSDs greater than 50% had average results below 20FC/100mL. Field duplicates with low bacteria levels (below 20FC/100mL) often show the higher variability and are analyzed separately from other duplicates (Mathieu 2006). When duplicates with low bacteria levels are separated, the data objectives are met with 7% exceeding a RSD of 50%. These data are accepted as adequate for this water quality review.

Portage Bay Shellfish Protection District (NWIC)
From 2009 through 2011, there were 32 sampling events in the Portage Bay Shellfish Protection District routine monitoring program conducted by NWIC staff. Field duplicates were collected for 10% of the samples. Approximately 9% had a RSD of greater than 50% and about 41% had a RSD of greater than 20%. These RSDs meet the data quality objectives listed above.

Coastal Drainages (WCC, MRC volunteers)
From 2009 through 2011, there were 36 sampling events in the Coastal Drainage routine monitoring program conducted by the WCC crew, WCPW staff, and trained MRC volunteers. Field duplicates were collected for 10% of the samples. Approximately 10% had a RSD of greater than 50% and about 46% had a RSD of greater than 20%. These RSDs meet the data quality objectives listed above.

Water Quality Status in Whatcom County Creeks and Rivers
The following table summarizes how 2011 fecal coliform results at each routine monitoring site compare to the state water quality standards. The total number of sites, number of sites failing the standard, number of sites partially meeting the standard, and number of sites meeting the standard are summarized for each watershed. More specific details for each monitoring site are provided in Appendix A.

Table 2. Summary of monitoring sites within each watershed in comparison to fecal coliform standards.

Watershed	Number of Sites	Number of Sites Exceeding Both Parts of Standards[a]	Number of Sites Exceeding One Part of Standard[b]	Number of Sites Meeting Standards[c]
California Creek	12	4 (33.3%)	3 (25.0%)	5 (41.7%)
Dakota Creek	18	3 (16.7%)	8 (44.4%)	7 (38.9%)
Terrell Creek	15	6 (40.0%)	9 (60.0%)	0 (0%)
Portage SPD	14	8 (57.1%)	2 (14.3%)	4 (28.6%)
Birch Bay Coastal	15	9 (60.0%)	4 (26.7%)	2 (13.3%)
Drayton Coastal	5	0 (0%)	3 (60.0%)	2 (40.0%)
Chuckanut Coastal	4	0 (0%)	1 (25.0%)	3 (75.0%)
Lummi Island Coastal	2	0 (0%)	1 (50.0%)	1 (50.0%)

a- Indicates frequent elevated fecal coliform levels.
b- Indicates occasional elevated fecal coliform levels (or spikes).
c- Indicates consistently lower fecal coliform levels.

Water Pollution Clean Up Programs
Through the enhanced PIC program, Whatcom County watersheds discharging to marine waters will be ranked and drainage-specific water quality improvement strategies will be developed and implemented through community outreach and engagement for the highest priority areas. Each year staff will determine the extent of priority areas that can be targeted based upon staff and other resource

availability. Whatcom County and the Whatcom Conservation District will work with landowners to identify and implement community solutions to elevated fecal coliform bacteria levels. Through community engagement, technical assistance, and incentive programs a community sense of ownership and stewardship will be developed for neighborhood creeks. A regulatory backstop will be utilized as a final tool when elevated fecal coliform levels remain in an area and where landowners have selected not to participate in the voluntary program and there are egregious or repeated violations of regulations.

The drainage-specific community outreach strategies will build off successful outreach components in programs implemented in Kitsap County and Whatcom County's Tenmile Watershed. The drainage-specific strategy will at a minimum include a series of three neighborhood meetings, a landowner survey, and educational materials. Neighborhood meetings will be held at an initial stage, mid-stage, and a final stage of each local effort. The landowner survey will be modeled after the Tenmile Watershed Restoration Project and focus on characteristics of the property, activities the landowner would be willing to do to improve water quality, attitudes toward watershed and water quality issues, decision-making factors, and ways to learn about land and water management activities. Educational materials will include options for controlling bacteria from diverse sources found in the rural landscape such as OSS, farm animals, pets, and urban wildlife. The form of appropriate educational materials will be determined in part by results of the landowner survey.

Once high ranking drainages are identified through routine monitoring, bracketed monitoring is needed to help track down hot spots in the drainage and identify stretches of the creek to be targeted for outreach, technical assistance, and financial assistance programs. If landowners choose to participate in the monitoring program, it will help raise awareness of water quality problems and develop ownership in identifying solutions. Developing a framework for improving water quality is most effective when hot spots or areas of consistently high bacteria levels can be identified within the neighborhood stream. Microbial source tracking may be used to assist landowners in developing a greater understanding of the bacteria sources within their neighborhood stream and where to focus best management practices.

When landowners are asked to change their practices to improve water quality, it is important to make these changes as easy as possible to implement. Two key resources that assist landowners to implement new management practices and repairs to OSS are technical and financial assistance. Agricultural Best Management Practices (BMP) technical assistance will be provided by the Whatcom Conservation District. A financial cost-share program for agricultural BMPs is being developed. County Health has partnered with the Industrial Credit Union to provide low-interest loans for landowners replacing or making repairs to their OSS.

Ranking Purpose, Criteria, and Methods

Through this program, watersheds in Whatcom County that discharge to marine waters have been ranked by order of importance. Drainage-specific water quality improvement strategies will be developed and implemented in highest priority drainages first.

The following ranking methods are an adaptation of the ranking methods used for the Kitsap County PIC Program in 2011. They consider water quality status (short and moderate-term) and potential public health threats. The application of the ranking methods to the routine monitoring stations identifies priority areas for water quality improvement projects. Some routine monitoring sites did not have three years of data as of December 2011 to be included in the 2011 ranking process.

The water quality status category evaluated waterbodies based upon the most current water quality data available. Water quality data were evaluated for the most recent calendar year and the previous three years (Appendix A). The data objective was a minimum of monthly sampling; however, some sites were not able to be sampled every month due to no or low flow conditions. Data for each site were compared to applicable standards for that waterbody.

The criteria and associated points are described below for the five categories analyzed: annual geometric mean, annual 90th percentile, three year geometric mean, three year geometric mean for the dry season, and three year geometric mean for the wet season. Additionally, each site was scored for current status of the shellfish growing area the waterbody discharges to. For each monitoring site, points were assigned for each of these five categories and the sum of the five scores was multiplied by the shellfish growing area score. The scores for each monitoring site are included in Appendix C.

Scoring Formula:
Total Water Quality Score = (12month GM score + 12month %score + 3year GM score + 3yeardry GMscore + 3yearwet GMscore)* shellfish growing area score

Twelve Month (2011) Geometric Mean:

- Creek meets the appropriate standard for FC geometric mean during the most recent calendar year – 0 points.
- Creek 2011 geometric mean is 1 to 5 times the appropriate standard – 2 points.
- Creek 2011 geometric mean is over 5 times the appropriate standard – 4 points.

Twelve Month (2011) 90th Percentile:

- Creek meets the appropriate standard for FC 90th percentile during the most recent calendar year – 0 points.
- Creek 2011 90th percentile is 1 to 5 times the appropriate standard – 2 points.
- Creek 2011 90th percentile is over 5 times the appropriate standard – 4 points.

Three Year Geometric Mean:

- Creek FC three-year geometric mean meets the appropriate standard– 0 points.
- Creek FC three-year geometric mean is 1 to 2 times the appropriate standard – 1 point.
- Creek FC three-year geometric mean is 2 to 5 times the appropriate standard – 2 points.
- Creek FC three-year geometric mean is 5 to 10 times the appropriate standard – 4 points.
- Creek FC three-year geometric mean is greater than 10 times the appropriate standard – 6 points.

Three Year Geometric Mean for Dry Season:

- Creek FC three-year geometric mean for the dry season (May-September) meets the appropriate standard– 0 points.
- Creek FC three-year geometric mean for the dry season (May-September) is 1 to 2 times the appropriate standard – 1 point.
- Creek FC three-year geometric mean for the dry season (May-September) is 2 to 5 times the appropriate standard – 2 points.
- Creek FC three-year geometric mean for the dry season (May-September) is 5 to 10 times the appropriate standard – 4 points.

- Creek FC three-year geometric mean for the dry season (May-September) is greater than 10 times the appropriate standard – 6 points.

Three Year Geometric Mean for Wet Season:

- Creek FC three-year geometric mean for the wet season (October- April) meets the appropriate standard– 0 points.
- Creek FC three-year geometric mean for the wet season (October- April) is 1 to 2 times the appropriate standard – 1 point.
- Creek FC three-year geometric mean for the wet season (October- April) is 2 to 5 times the appropriate standard – 2 points.
- Creek FC three-year geometric mean for the wet season (October- April) is 5 to 10 times the appropriate standard – 4 points.
- Creek FC three-year geometric mean for the wet season (October- April) is greater than 10 times the appropriate standard – 6 points.

Shellfish Growing Area Score:

- Recreational, tribal, and commercial shellfish growing area with no advisory or closure – 1 point.
- Recreational closure or threatened commercial or tribal area – 2 points.
- Closed or conditionally approved commercial or tribal area – 3 points.

Ranking Results

The water quality scores were calculated for all monitoring stations that had three years of data (Appendix C). Appendix D provides a map illustrating levels of priority for all routine monitoring sites. The top ten ranked drainages based upon 2011 data and the above described ranking criteria and scores are:

1. CA14c- California Creek (48 points)
2. TribDak2- Dakota Creek (42 points)
3. TribDak3- Dakota Creek (42 points)
4. CA9- California Creek (36 points)
5. TribDak4- Dakota Creek (33 points)
6. TribTerBC2- Lower Terrell Creek (30 points)
7. TribTerBC1- Lower Terrell Creek 28 points)
8. BB8- Birch Bay Coastal (24 points)
9. CA1- California Creek (24 points)
10. K1a- Portage SPD (24 points)

Discussion

California Creek

The California Creek watershed is one of the two major areas discharging to Drayton Harbor which currently has a seasonal closure to shellfish harvesting from November to February. Three out of fourteen routine sites monitored in the California Creek watershed ranked in the top ten priority drainages for the PIC Program. CA14c and CA9 are seasonal creeks located in the upper portion of the watershed above Cal 6.5. This area was identified as being in most need of fecal coliform reductions through the *Draft Drayton Harbor Watershed Fecal Coliform Total Maximum Daily Load: Water Quality Improvement Report* (Hood and Mathieu 2010). CA14c has shown consistently high bacteria levels since 2006 when the creek was first monitored. The 2011 geometric mean was three times the standard and the dry season three-year geometric mean is nearly 12 times the standard (Appendix A). CA9 had an

annual geometric mean two times the standard and demonstrated a dry season three-year geometric mean six times the standard. CA1 is a perennial creek in the lower portion of the watershed. The annual geometric mean for CA1 is nearly three times the standard and the dry season three-year geometric mean is over four times the standard. Over 30 percent of the 2011 samples exceed 200 FC/100mL at all three of these sites.

Dakota Creek

The Dakota Creek watershed is the other of the two major areas discharging to Drayton Harbor. Three of seventeen routine sites monitored in the Dakota Creek watershed ranked in the top ten priority drainages for the PIC Program. TribDak2, TribDak3, and TribDak4 are all located in the lower portion of the Dakota Creek watershed and are perennial creeks. TribDak2 has a 2011 geometric mean three times the standard and a dry season three-year geometric mean nearly six times the standard. TribDak3 has a 2011 geometric mean almost five times the standards and dry season three-year geometric mean over six times the standard. TribDak4 has a 2011 geometric mean almost three times the standard and dry season three-year geometric mean over five times the standard. All of these sites had fifty percent or more of the 2011 results exceed 200FC/100mL.

Lower Terrell Creek

Terrell Creek is the primary freshwater discharge to Birch Bay. There is currently a closure of shellfish harvesting around the mouth of Terrell Creek due to poor water quality in the creek. Two of fourteen Terrell Creek routine sites ranked in the top ten priority drainages for the PIC Program. Both of these sites are seasonal creeks that discharge into the lower portion of Terrell Creek. TribTerBC1 and TribTerBC2 have 2011 geometric means three times the standard for the Birch Bay watershed. TribTerBC1 has a dry season three-year geometric mean seven times the standard and TribTerBC2 is twenty-one times the standard in the dry season. In 2011, over fifty percent of the samples at each site exceeded 100FC/100mL, the 90th percentile threshold for the Birch Bay watershed.

Birch Bay Coastal Drainage

There are several smaller coastal drainages that discharge directly to Birch Bay and exceed water quality standards. BB8 is a seasonal creek where the highest bacteria levels at routine monitoring sites have been observed. In fact, in 2011 one sample had a result of 110,000FC/100mL. While flows from these drainages are far smaller than those seen at Terrell Creek, the bacteria levels can represent significant public health concerns. The 2011 geometric mean for BB8 was thirty-two times the standard and the dry season three-year geometric mean was fifty-nine times the standard. One hundred percent of the sample collected in 2011 exceeded 100 FC/100mL.

Portage Bay Shellfish Protection District (SPD)

One of fifteen routine sites in the Portage Bay Shellfish Protection District ranked in the top ten priority areas for the PIC Program. K1a is a small creek that discharges into Kamm directly upstream of the Hampton Road bridge. The 2011 geometric mean for K1a was nearly four times the standard and the dry season three-year geometric mean was over four times the standard. Over eighty percent of the samples collected in 2011 exceeded 200FC/100mL.

While fecal coliform levels have been seen increasing at several sites in the Portage Bay SPD, the current status of the shellfish harvesting area and geometric means are not at the same levels seen in the Drayton Harbor and Birch Bay watersheds. Thus, with a comprehensive look across the county, the PIC Program will initially focus on Drayton Harbor and Birch Bay sites unless additional resources are identified.

Recommendations

- Priority Area 1- Continue enhanced water quality monitoring and landowner communication in Brown-Malloy drainage (CA14c). This is a seasonal creek and is generally dry for 3-4 months of the year. While this area should remain a priority, a greater priority should be placed on high ranking perennial creeks. This drainage is in the upper portion of the California Creek watershed and is depicted with a red dot and pink outline in Appendix D.
- Priority Area 2- In 2012 and 2013, develop and implement a water quality improvement strategy for the three tributaries in the lower portion of Dakota Creek (TribDak2, TribDak3, and TribDak4). These drainages are adjacent to each other, all rank in the top ten, are perennial creeks, and have a similar rural character. Watershed characterization and establishment of additional monitoring sites and a monitoring schedule should be completed in summer 2012. An initial community meeting should be targeted for early fall. These drainages are depicted in Appendix D with red dots and a pink outline.
- Priority Area 3- Continue work with Birch Bay Watershed and Aquatic Resources Management District (BBWARM) to identify sources of bacterial pollution in residential drainages in lower Terrell Creek and priority Birch Bay coastal drainage (TribTerBC2, TribTerBC1, and BB8). Partner with BBWARM and the MRC to develop and distribute community education materials for residential sources of bacteria (e.g. OSS, urban wildlife, and pets). While these sites are not the highest ranking of the top ten, the established partnerships provide additional resources and efficient mechanisms for sharing information with the community. These drainages are depicted in Appendix D with red and orange dots and orange outlines.

References

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Appendix A: Water Quality Review by Monitoring Station

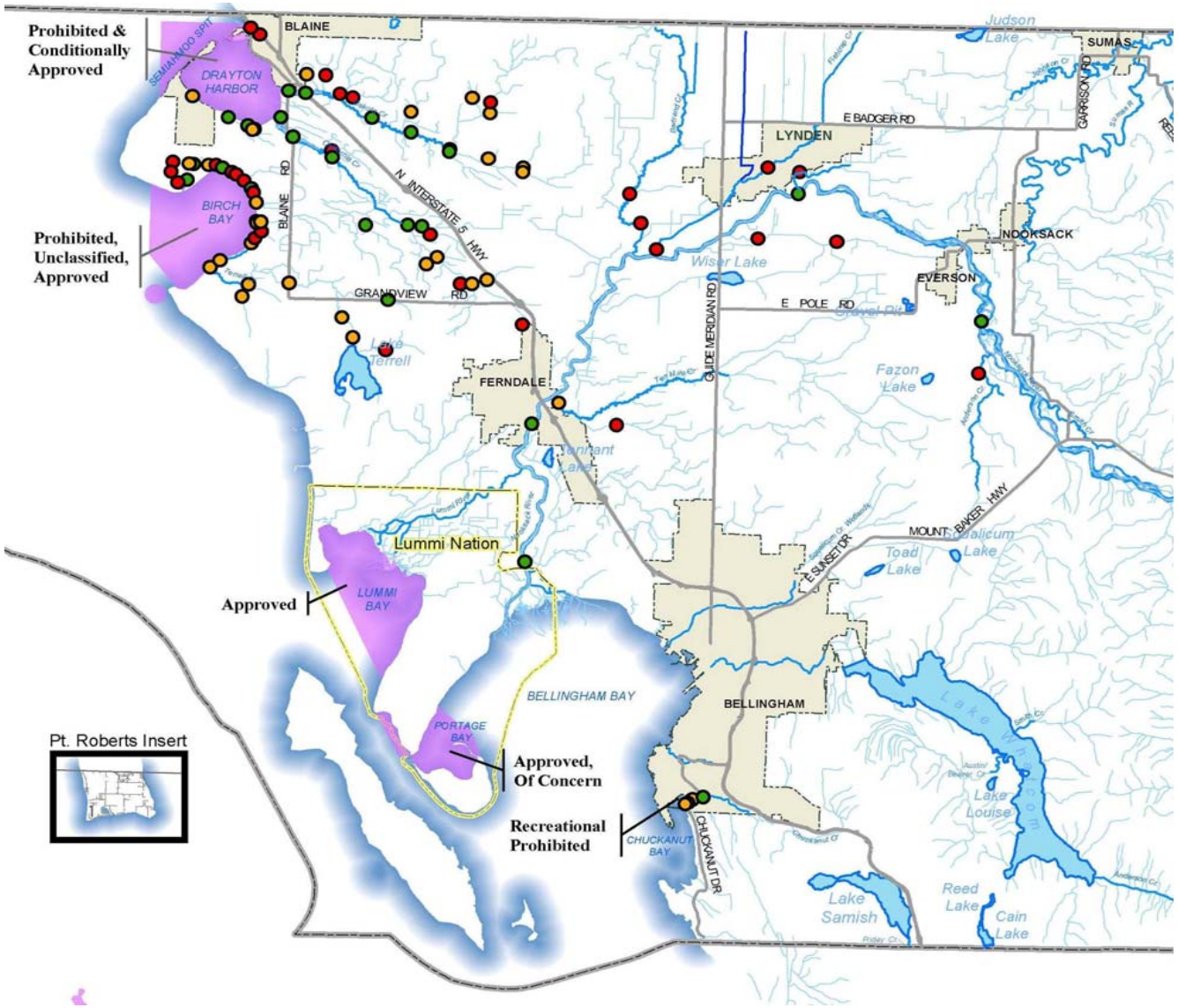
								Three Year GMV		
Watershed	**Station**	**#**	**Range**	**GMV**	**#>200**	**%>200**	**2011 Meets Stnd?**	**All**	**Wet**	**Dry**
BB Coastal	BB8	8	110-110,000	1628.2	8	100.0	Exceeds Both	713.9	395.0	2953.5
BB Coastal	BB21	5	14-5300	464.2	2	40.0	Exceeds Both	155.1	118.2	
BB Coastal	BB11	10	2-15,000	169.2	6	60.0	Exceeds Both	128.9	80.0	539.8
BB Coastal	BB7	7	2-26,000	123.1	3	42.9	Exceeds Both	89.3	45.2	
BB Coastal	BB4	10	4-2600	121.9	6	60.0	Exceeds Both	96.0	70.0	162.6
BB Coastal	BB6	9	16-8700	113.4	4	44.4	Exceeds Both	81.4	66.9	141.0
BB Coastal	BB16	5	8-1000	106.9	3	60.0	Exceeds Both	93.8	99.4	
BB Coastal	BB18	5	6-620	92.9	2	40.0	Exceeds Both	58.3	44.8	
BB Coastal	BB22	8	8-6400	89.2	3	37.5	Exceeds Both	80.5	49.9	307.1
BB Coastal	BB20	5	8-500	45.4	1	20.0	Exceeds One	42.6	36.6	82.2
BB Coastal	BB3	10	4-180	31.7	3	30.0	Exceeds One	51.4	46.4	58.3
BB Coastal	BB5	6	2-2900	26.0	1	16.7	Exceeds One	33.6	15.4	
BB Coastal	BB19	5	2-400	15.6	1	20.0	Exceeds One	8.4	7.1	58.0
BB Coastal	BB15	4	2-62	7.4	0	0.0	Meets Both	14.0	10.5	
BB Coastal	BB12	5	2-64	4.0	0	0.0	Meets Both	6.1	6.7	
California	CA14c	9	36-5800	298.4	5	55.6	Exceeds Both	472.2	375.5	1180.1
California	CA1	12	22-6300	277.3	5	41.7	Exceeds Both	191.5	107.4	426.4
California	CA9	9	34-2400	202.4	3	33.3	Exceeds Both	272.6	163.7	637.6
California	CA16	11	10-1200	100.7	4	36.4	Exceeds Both	134.7	67.6	358.1
California	CA8	11	4-2000	68.3	4	36.4	Exceeds One	80.6	23.6	480.0
California	Cal 7.5	10	8-240	47.9	2	20.0	Exceeds One	81.8	58.3	142.5
California	Cal 0.1	12	14-720	44.2	2	16.7	Exceeds One	40.0	48.7	30.4
California	CA15	12	2-360	33.9	3	25.0	Exceeds One	50.2	34.7	85.9
California	Cal 0.8	12	12-500	53.9	1	8.3	Meets Both	60.2	52.6	71.9
California	Cal 6.2	10	6-220	47.8	1	10.0	Meets Both	91.8	59.9	168.1

								Three Year GMV		
Watershed	**Station**	**#**	**Range**	**GMV**	**#>200**	**%>200**	**2011 Meets Stnd?**	**All**	**Wet**	**Dry**
California	Cal 5.0	12	2-170	45.7	0	0.0	Meets Both	71.0	47.0	125.5
California	Cal 0.8*	12	6-5220	42.0	1	8.3	Meets Both	61.6	50.7	80.7
California	CA6	12	2-160	24.5	0	0.0	Meets Both	32.2	19.4	62.7
California	CA3	5	2-170	17.2	0	0.0	Meets Both	20.1	15.8	82.9
Chuckanut	CB1	9	1-5100	21.1	1	11.1	Exceeds One	15.9	6.7	138.3
Chuckanut	CB4	10	9-2200	33.2	1	10.0	Meets Both	36.5	20.3	87.1
Chuckanut	CB3	12	4-2500	33.2	1	8.3	Meets Both	41.6	17.3	102.2
Chuckanut	CB2	12	5-5700	22.8	1	8.3	Meets Both	23.5	14.5	102.5
Dakota	TribDak3	12	50-3200	493.8	8	66.7	Exceeds Both	450.0	352.1	620.4
Dakota	TribDak2	12	54-1400	304.9	7	58.3	Exceeds Both	386.9	287.7	570.0
Dakota	TribDak4	12	54-4000	287.2	6	50.0	Exceeds Both	305.7	192.1	561.0
Dakota	TribDakN2	12	6-2400	92.5	3	25.0	Exceeds One	97.0	45.9	257.6
Dakota	TribDakS2	12	2-1800	90.7	6	50.0	Exceeds One	86.3	44.3	206.3
Dakota	TribDak1	9	10-760	84.1	3	33.3	Exceeds One	94.9	92.6	100.3
Dakota	TribDakS1	12	6-1300	53.9	2	16.7	Exceeds One	73.0	45.9	133.8
Dakota	SFDak2.2	12	8-460	51.2	2	16.7	Exceeds One	62.4	39.6	113.1
Dakota	TribDak5	12	2-440	47.7	2	16.7	Exceeds One	65.1	34.7	147.9
Dakota	NFDak2.5	12	16-460	74.4	1	8.3	Meets Both	142.4	88.2	266.6
Dakota	NFDak0.1	12	6-170	51.1	0	0.0	Meets Both	79.5	62.8	108.2
Dakota	Dak 0.7	12	10-320	49.5	1	8.3	Meets Both	53.9	49.1	59.3
Dakota	Dak 3.1	12	6-240	45.5	1	8.3	Meets Both	62.5	52.0	79.6
Dakota	TribDakN1	8	4-150	43.4	0	0.0	Meets Both	66.3	68.7	59.5
Dakota	Dak 6.8	12	2-170	38.6	0	0.0	Meets Both	58.5	44.9	82.7
Dakota	SFDak0.1	12	8-190	37.2	0	0.0	Meets Both	51.9	37.3	79.8
Dakota	Dak 0.1	12	10-170	30.4	0	0.0	Meets Both	37.7	44.3	30.1
Drayton Coastal	DH3	11	1-2100	47.7	4	36.4	Exceeds One	20.2	10.3	89.8
Drayton Coastal	DH5	10	2-2400	25.5	2	20.0	Exceeds One	37.6	20.5	116.6
Drayton Coastal	DH14	8	1-280	16	1	12.5	Exceeds One	13.2	6.4	67.1

								Three Year GMV		
Watershed	**Station**	**#**	**Range**	**GMV**	**#>200**	**%>200**	**2011 Meets Stnd?**	**All**	**Wet**	**Dry**
Drayton Coastal	DH2	10	1-590	8.2	1	10.0	Meets Both	7.5	5.3	15.3
Lummi Island Coastal	LI4	5	2-730	58.6	2	40.0	Exceeds One	58.8	85.0	30.5
Lummi Island Coastal	LI1	5	4-114	31.7	0	0.0	Meets Both	45.2	31.9	144.0
Portage SPD	K1a	11	40-1120	359.2	9	81.8	Exceeds Both	329.8	230.1	434.0
Portage SPD	S3	12	40-3210	267.5	8	66.7	Exceeds Both	224.8	328.3	154.8
Portage SPD	S1	11	50-1560	261.0	5	45.5	Exceeds Both	192.4	211.4	179.6
Portage SPD	K1	12	60-1020	243.6	8	66.7	Exceeds Both	210.5	162.1	316.0
Portage SPD	F1	11	90-860	239.7	6	54.5	Exceeds Both	176.1	125.8	242.4
Portage SPD	F4	12	40-1200	182.5	6	50.0	Exceeds Both	165.7	115.0	247.0
Portage SPD	DRC	12	60-520	172.0	5	41.7	Exceeds Both	127.7	95.4	167.5
Portage SPD	B1	12	10-370	138.8	6	50.0	Exceeds Both	106.7	72.8	150.5
Portage SPD	AND	12	10-640	109.5	4	33.3	Exceeds Both	114.8	51.8	321.1
Portage SPD	B3	12	20-320	91.4	4	33.3	Exceeds One	94.8	59.1	167.6
Portage SPD	T1	11	10-320	89.4	4	36.4	Exceeds One	68.1	42.3	112.2
Portage SPD	M1	11	10-201	56.4	1	9.1	Meets Both	39.7	41.5	31.6
Portage SPD	M2	12	10-2000	52.3	1	8.3	Meets Both	32.6	39.0	23.8
Portage SPD	M5	12	5-2000	39.0	1	8.3	Meets Both	17.7	15.8	18.8
Portage SPD	M4	12	4-250	29.7	1	8.3	Meets Both	16.6	13.4	15.8
Terrell	TribTerBC1	16	4-18,000	165.3	9	56.3	Exceeds Both	128.4	100.0	354.5
Terrell	TribTerBC2	17	12-17,000	164.1	9	52.9	Exceeds Both	106.0	51.5	1055.6
Terrell	TribFERN1	16	2-25,000	114.5	6	37.5	Exceeds Both	79.4	49.4	216.0
Terrell	Ter0.7	24	10-13,000	94.9	6	25.0	Exceeds Both	55.5	40.0	90.1
Terrell	TribTerLP1	24	6-2400	68.0	8	33.3	Exceeds Both	46.9	29.1	116.2
Terrell	Ter7.8	22	4-6000	64.5	7	31.8	Exceeds Both	48.0	19.4	178.4
Terrell	Ter5.0	22	2-4600	45.6	7	31.8	Exceeds One	49.3	26.8	118.2
Terrell	Ter1.9	24	6-3600	42.4	6	25.0	Exceeds One	42.7	32.4	60.6
Terrell	Ter0.1	24	6-2400	41.6	4	16.7	Exceeds One	30.3	24.2	39.4
Terrell	Ter1.6	24	6-3900	41.0	3	12.5	Exceeds One	33.3	26.7	51.5

								Three Year GMV		
Watershed	**Station**	**#**	**Range**	**GMV**	**#>200**	**%>200**	**2011 Meets Stnd?**	**All**	**Wet**	**Dry**
Terrell	Ter0.1*	24	2-3500	30.7	4	16.7	Exceeds One	26.2	25.7	24.7
Terrell	Ter8.4	23	2-2100	25.7	6	26.1	Exceeds One	21.2	12.3	46.2
Terrell	Ter3.3	16	2-400	23.0	4	25.0	Exceeds One	20.5	18.1	27.0
Terrell	TribFIN1	17	2-3700	15.0	4	23.5	Exceeds One	8.7	8.7	34.1

Appendix B: Whatcom County Fecal Coliform Levels and Shellfish Growing Area Status Map



Appendix C: Water Quality Scores by Station

Stream	Station	12 Month GM	12 Month % > 200	3 Year GM	3 Year Dry Season GM	3 Year Wet Season GM	Shellfish Area Multiplier*	Total Score**	Comments
California	CA14c	2	4	2	6	2	3	48	follow up sampling multiple yrs, some contacts
Dakota	TribDak2	2	4	2	4	2	3	42	adjacent to TribDak3 and TribDak4
Dakota	TribDak3	2	4	2	2	4	3	42	adjacent to TribDak2 and TribDak4
California	CA9	2	2	2	4	2	3	36	below confluence of two creeks/drainages
Dakota	TribDak4	2	4	2	1	2	3	33	adjacent to TribDak2 and TribDak3
Terrell	TribTerBC2	2	4	2	6	1	2	30	initial follow up sampling conducted
Terrell	TribTerBC1	2	4	2	4	2	2	28	small residential drainage
BB Coastal	BB8	4	4	6	6	4	1	24	follow up sampling conducted in 2011 and 2012, area of focus for BBWARM
California	CA1	2	2	1	2	1	3	24	small trib discharges to lower Cal Creek
Kamm	K1a	2	4	2	2	2	2	24	very small drainage
Kamm	K1	2	4	2	2	1	2	22	
Scott	S3	2	4	2	1	2	2	22	upstream of S1
California	CA16	2	2	1	2	0	3	21	
Fishtrap	F1	2	4	1	2	1	2	20	downstream of F4
Fishtrap	F4	2	4	1	2	1	2	20	upstream of F1
Butler	TribFERN1	2	2	1	4	0	2	18	upstream site initiated in late 2011
Dakota	TribDakS2	0	4	0	2	0	3	18	
Scott	S1	2	2	1	1	2	2	16	downstream of S3
Bertrand	B1	2	4	1	0	1	2	16	
Anderson	AND	1	2	1	2	1	2	14	
BB Coastal	BB11	2	4	1	1	6	1	14	
California	CA8	0	2	0	2	0	3	12	culvert being replaced summer 2012

Stream	Station	12 Month GM	12 Month % > 200	3 Year GM	3 Year Dry Season GM	3 Year Wet Season GM	Shellfish Area Multiplier*	Total Score**	Comments
Dakota	TribDakN2	0	2	0	2	0	3	12	
Terrell	Ter7.8	2	2	0	2	0	2	12	
Terrell	Ter0.7	2	2	1	1	0	2	12	
Terrell	TribTerLP1	2	2	0	2	0	2	12	
BB Coastal	BB22	2	2	2	4	0	1	10	
BB Coastal	BB4	2	4	1	2	1	1	10	
BB Coastal	BB21	4	2	2	0	2	1	10	
Dakota	NFDak2.5	0	0	1	2	0	3	9	
California	Cal 7.5	0	2	0	1	0	3	9	
Dakota	TribDak1	0	2	0	1	0	3	9	
Dakota	TribDak5	0	2	0	1	0	3	9	
Dakota	TribDakS1	0	2	0	1	0	3	9	
Dakota	SFDak2.2	0	2	0	1	0	3	9	
BB Coastal	BB6	2	2	1	2	1	1	8	
Terrell	Ter5.0	0	2	0	2	0	2	8	
Terrell	TribTerJ1	0	2	0	2	0	2	8	
BB Coastal	BB16	2	4	1	0	1	1	8	
Bertrand	B3	0	2	0	1	0	2	6	
Chuckanut	CB1	0	2	0	1	0	2	6	
Tenmile	T1	0	2	0	1	0	2	6	
Terrell	Ter1.9	0	2	0	1	0	2	6	
Terrell	Ter1.6	0	2	0	1	0	2	6	
Drayton	DH5	0	2	0	0	0	3	6	
California	CA15	0	2	0	0	0	3	6	

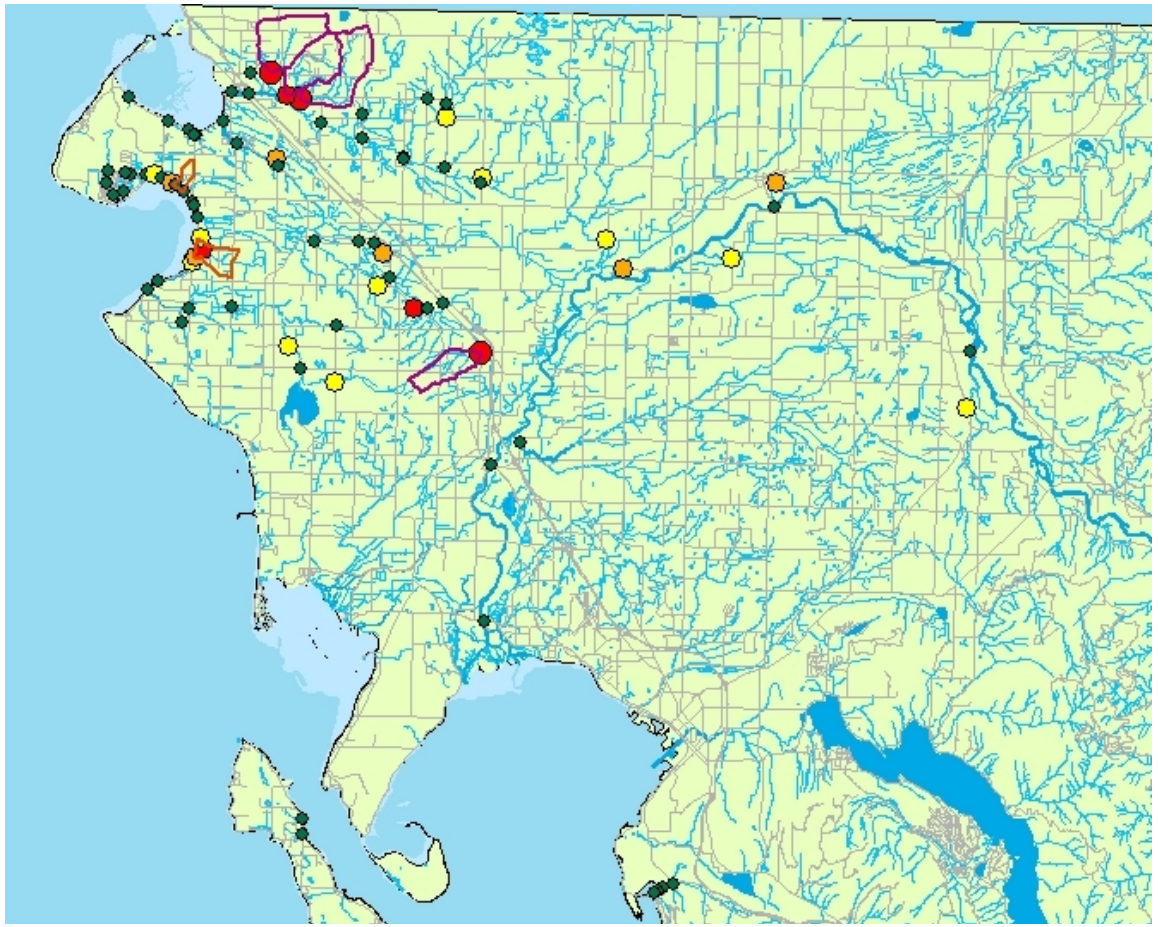
Stream	Station	12 Month GM	12 Month % > 200	3 Year GM	3 Year Dry Season GM	3 Year Wet Season GM	Shellfish Area Multiplier*	Total Score**	Comments
Drayton	DH3	0	2	0	0	0	3	6	
Drayton	DH14	0	2	0	0	0	3	6	
BB Coastal	BB3	2	2	1	0	0	1	5	
BB Coastal	BB7	2	2	1	0	0	1	5	
BB Coastal	BB18	2	2	1	0	0	1	5	
Fingalson	TribFIN1	0	2	0	0	0	2	4	
Terrell	Ter8.4	0	2	0	0	0	2	4	
Terrell	Ter3.3	0	2	0	0	0	2	4	
Terrell	Ter0.1*	0	2	0	0	0	2	4	
Terrell	Ter0.1	0	2	0	0	0	2	4	
California	Cal 5.0	0	0	0	1	0	3	3	
California	Cal 6.2	0	0	0	1	0	3	3	
Dakota	NFDak0.1	0	0	0	1	0	3	3	
BB Coastal	BB19	0	2	0	1	0	1	3	
BB Coastal	BB20	0	2	0	1	0	1	3	
Chuckanut	CB3	0	0	0	1	0	2	2	
Chuckanut	CB2	0	0	0	1	0	2	2	
BB Coastal	BB5	0	2	0	0	0	1	2	
Lummi Island	LI4	0	2	0	0	0	1	2	
Lummi Island	LI1	0	0	0	1	0	1	1	
BB Coastal	BB12	0	0	0	0	0	1	0	
BB Coastal	BB15	0	0	0	0	0	1	0	
California	Cal 0.8	0	0	0	0	0	3	0	
California	Cal 0.8*	0	0	0	0	0	3	0	

Stream	Station	12 Month GM	12 Month % > 200	3 Year GM	3 Year Dry Season GM	3 Year Wet Season GM	Shellfish Area Multiplier*	Total Score**	Comments
California	CA3	0	0	0	0	0	3	0	
California	CA6	0	0	0	0	0	3	0	
Chuckanut	CB4	0	0	0	0	0	2	0	
Dakota	Dak 0.1	0	0	0	0	0	3	0	
Dakota	Dak 0.7	0	0	0	0	0	3	0	
Dakota	Dak 3.1	0	0	0	0	0	3	0	
Dakota	SFDak0.1	0	0	0	0	0	3	0	
Dakota	TribDakN1	0	0	0	0	0	3	0	
Drayton	DH4	0	0	0	0	0	3	0	
Drayton	DH2	0	0	0	0	0	3	0	
Nooksack	M5	0	0	0	0	0	2	0	
Nooksack	M4	0	0	0	0	0	2	0	
Nooksack	M2	0	0	0	0	0	2	0	
Nooksack	M1	0	0	0	0	0	2	0	

*Shellfish growing area score = 1 for open area, 2 for threatened tribal or commercial/closed recreational area, 3 closed or CA commercial area)

** Total Score= (12GM score + 12%score + 3yr GM score + 3yrdry GMscore + 3yrwet GMscore)* shellfish growing area score

Appendix D: 2011 Ranked Drainages Based Upon Water Quality Scores



This map illustrates ranked drainages for the Whatcom County Pollution Identification and Control (PIC) Program for 2012/2013. The water quality scores are reflective of calculations included in Appendices B and C. Red dots indicate highest priority drainages (water quality score ≥ 30), orange dot indicate moderate priority drainages (water quality score 20-29), yellow dot indicates low priority (water quality score 11-19), and green dot indicates lowest priority (water quality score 0-10). Drainages outlined in purple are priority areas 1 and 2 described under the recommendation section. Drainages outlined in orange are priority area 3 and would be pursued under partnership with BBWARM and the MRC with adequate resources.

Appendix E: Routine Sampling Stations in Whatcom County

Watershed	Site ID	Site Location
Terrell Creek	Ter 0.1	Mouth of Terrell Creek
Terrell Creek	Ter 0.1*	Mouth of Terrell Creek, upstream of confluence with Leisure Park
Terrell Creek	TribTer LP1	Leisure Park Tributary, East of Birch Bay Drive
Terrell Creek	TribTer BC2	Birch Creek @Leeside
Terrell Creek	TribTer BC1	Birch Creek @Morrison/Wooldridge
Terrell Creek	Ter 0.7	Lower Terrell Creek @ Jackson Road
Terrell Creek	Ter 1.6	Terrell Creek @Birch Bay State Park Bridge
Terrell Creek	Ter 1.9	Terrell Creek @ Helwig Bridge (State Park)
Terrell Creek	Trib Ter J1	Culvert@Grandview, West of Jackson
Terrell Creek	Ter 3.3	Terrell Creek @ Jackson Road, North of Grandview
Terrell Creek	Ter 5.0	Terrell Creek @ Blaine Road
Terrell Creek	TerKick (Ter 6.3)	Terrell Creek @ Kickerville Road
Terrell Creek	Ter 6.9	Terrell Creek @ Grandview
Terrell Creek	Ter 7.8	Terrell Creek @Brown Road
Terrell Creek	Ter 8.4	Terrell Creek @Aldergrove Road
Terrell Creek	Trib FERN1	North Star Road, South of Aldergrove
Terrell Creek	Trib FERN2	Butler Ditch @ Olsen
Terrell Creek	Trib FIN1	Grandview Road, East of North Star, small culvert that discharges to pool
Terrell Creek	Trib FIN1a	Grandview Road, East of North Star, large culvert connecting stream under road
California Creek	Cal 0.1 (C1)	Mouth of California Creek at Drayton Harbor Road Bridge
California Creek	Cal 0.8 (C2)	California Creek at Blaine Road Bridge
California Creek	Cal 0.8*	California Creek at Kickerville Bridge
California Creek	CA1 (TribCal-2)	Downstream side of cross-culvert at Kickerville, west of Cal Creek
California Creek	CA3 (TribCal-3)	Downstream side of cross culvert at Arnie, east of Ham
California Creek	Cal 5.0 (C3)	California Creek at Valley View, downstream bridge
California Creek	CA6	Upstream side of cross culvert at Arnie Road, west of Bruce
California Creek	CA16 (TribCal-5)	Main Street Custer at dead end
California Creek	Cal 6.2	California Creek at Bruce Road
California Creek	CA8 (TribCal-4)	Upstream side of cross culvert at Bay Road, west of Bruce Road
California Creek	CA9	Upstream side of cross culvert at Fox and Vista
California Creek	Cal 7.5	California Creek at Fox Road, east of Vista
California Creek	CA15	Upstream side of cross culvert at Portal, south of Farris
California Creek	CA14c	Cross culvert at Brown Road, west of railroad
Dakota Creek	Dak 0.1 (D1)	Dakota Creek at Blaine Road Bridge
Dakota Creek	TribDak1	Downstream end of cross culvert at Sweet Road, east of Odell
Dakota Creek	TribDak2	Upstream of cross culvert at Sweet Road, west of Harvey
Dakota Creek	TribDak4	Upstream of cross culvert at Hoier Road, east of Harvey
Dakota Creek	TribDak3	Downstream end of cross culvert at Rogers Road, south of Hoier
Dakota Creek	Dak3.1 (DG)	Dakota Creek at Giles Road
Dakota Creek	TribDak5	Bridge at Valley View, south of McGee
Dakota Creek	Dak6.8 (D2)	Dakota Creek at Valley View and Behme Roads
Dakota Creek	NFDak0.1 (D3)	NF Dakota at Custer School Road (upstream of bridge)
Dakota Creek	SFDak0.2 (D4)	SF Dakota at Custer School Road (downstream of bridge)
Dakota Creek	TribDakN1	Downstream end of cross culvert at Haynie Road, east of Stein
Dakota Creek	NFDak2.5	NF Dakota Creek at Delta Line Road, south of Haynie

Watershed	Site ID	Site Location
Dakota Creek	TribDakN2	Upstream side of cross culvert at Delta Line, north of Badger
Dakota Creek	TribDakS1	Downstream of culvert at Delta Line, south of Loomis Trail (2nd culvert)
Dakota Creek	SFDak2.2	Upstream side of bridge for SF Dakota at Sunrise Road
Dakota Creek	TribDakS2	Downstream side of bridge at Sunrise Road, north of SF Dakota
Chuckanut Coastal	CB1	Small Woodstock Farm creek at culvert below dam structure
Chuckanut Coastal	CB2	Chuckanut Creek at Arroyo Park- near stream gage station
Chuckanut Coastal	CB3	Chuckanut Creek 18th Street Alley Bridge
Chuckanut Coastal	CB4	Mouth of Chuckanut Creek @ the end of the footpath from Woodstock
Birch Bay Coastal	BB03	Birch Bay Golf Club, 7900 BB. Dr.
Birch Bay Coastal	BB04	8036 BB Dr., Mariners Cove 24" concrete pipe on shoreline
Birch Bay Coastal	BB05	24"concrete pipe on shoreline across BB Dr. from Century Realty
Birch Bay Coastal	BB06	Outfall across from old Thai Steakhouse. Concrete culvert.
Birch Bay Coastal	BB07	8178 BB Dr. & Beach Way
Birch Bay Coastal	BB08	Shoreline outfall @ 8208 Birch Bay Dr. (Cedar)
Birch Bay Coastal	BB11	Deer Trail, Birch Point Rd., 1/2 submerged, 12" metal pipe.
Birch Bay Coastal	BB12	5216 Birch Point Rd. & Shintaffer, shoreline pipe.
Birch Bay Coastal	BB15	BB Village, structure draining "Big Lake" detention pond to marina
Birch Bay Coastal	BB16	BB Village, Beaver Pond inlet structure to marina at Comox & Chehalis
Birch Bay Coastal	BB18	BB Village, ditch just east of 5550 Salish Road on north side of road
Birch Bay Coastal	BB19	BB Village, rock lined ditch running perpendicular to Salish @ Cowichan
Birch Bay Coastal	BB20	BB Village, inlet to Roger's Slough, located near the "old" BB Village gate
Birch Bay Coastal	BB21	BB Village, Northeast corner of Skeena Way and Quinault Rd. intersection
Birch Bay Coastal	BB22	Culvert passing under Birch Point Rd. into BB Village (at speed limit sign)
Drayton Coastal	DH2	Outfall at shoreline at junction of Harborview and Drayton Harbor Rds
Drayton Coastal	DH3	24" cement pipe 10 m west of DH2 outfall
Drayton Coastal	DH4	24" cement pipe 20 m west of DH3 near 4985 DH Rd.
Drayton Coastal	DH5	Harbor Hillside Phase 1, 8" PVC pipe via public trail below bioswale
Drayton Coastal	DH14	1565 DH Rd., ditch @ property corner between driveway and DH Rd.
Lummi Island Coastal	LI1	Unnamed seasonal creek north of ferry landing
Lummi Island Coastal	LI4	Unnamed seasonal creek south of ferry landing
Portage SPD	M5	Mainstem Nooksack River at Everson @ E.Pole Rd
Portage SPD	M4	Mainstem Nooksack River at Lynden @ Hannegan Rd
Portage SPD	M2	Mainstem Nooksack River at Ferndale @ Axton Rd
Portage SPD	M1	Mainstem Nooksack River at Marietta @ Marine Dr
Portage SPD	DRC	Deer Creek @ Northwest Rd
Portage SPD	AND	Anderson Creek @ Roberts
Portage SPD	S1	Scott @ Blysma Rd
Portage SPD	S3	Scott @ Thiel Rd
Portage SPD	K1	Kamm @ Hampton Rd
Portage SPD	B1	Bertrand Creek @ Wileys Rd
Portage SPD	T1	Tenmile Creek @ Barrett Rd
Portage SPD	T2	Tenmile Creek @ W.Laurel or Northwest
Portage SPD	F1	Fishtrap Creek @ River Rd
Portage SPD	F4	Fishtrap Creek @ E. Main (7th)
Semiahmoo Bay	CC	Mouth of Cain Creek
Semiahmoo Bay	CCO	Cain Creek Outfall at Mouth
Drayton Coastal	LS5	Lift Station No. 5

(Data collected by WCPW, NWIC, MRC volunteers, and WCC crew in 2011)