



## Whatcom Clean Water Program Quarterly Progress Report April 1 - June 30, 2014

### ***Program partners continue bacteria pollution identification and correction efforts -***

With Whatcom County and other agencies and tribes as prominent partners, a goal of the Whatcom Clean Water Program is to reduce fecal coliform bacteria pollution in local waterways to a level that will not affect public health. Bacteria reduction efforts are focused in areas of the Drayton Harbor watershed and in the lower Nooksack/Portage Bay watershed.

Pages 2-11 of this report provide detail of partner efforts to monitor water quality and to work with local residents to find and correct preventable sources of fecal coliform bacteria pollution from failing septic systems and from livestock and pets. Pages 12-16 include maps and results of fecal coliform sampling.

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### ***Quarterly Overview***

#### ***Event planned to celebrate water -***

To celebrate the gift of clean water, Whatcom County Public Works and many partners planned this quarter to host an [Oysterfest Northwest](#) event on September 6 from 12pm-4pm at Bellewood Acres to help kick off the annual [Whatcom Water Weeks](#). Everyone is invited to attend.

#### ***Annual review of Whatcom County water quality -***

In June, Whatcom County Public Works completed a [2013 Annual Water Quality Report](#). The report summarizes water quality status at approximately 90 sites throughout Whatcom County coastal drainages. Routine monitoring data, recurring shellfish harvest closures and recent public health advisories support that elevated fecal coliform levels in many of the county's waterways continue to be a widespread problem. Pathogens associated with fecal coliform bacteria can make people sick.

#### ***Fecal coliform monitoring results in Portage Bay contribute to worsening water quality trend -***

High bacteria results were found at many marine water stations during the Washington Department of Health's routine sampling event in early May 2014, contributing to concerns about the classification of the shellfish growing area. Over the past five years, water quality trends at many of the marine water stations in the Portage Bay Shellfish Growing Area have been worsening and are approaching the limit for open, unrestricted commercial shellfish harvesting .

The deteriorating water quality trends in Portage Bay motivated the Portage Bay Shellfish Protection District to begin actively meeting again in early 2013 to revise its 1998 shellfish recovery plan. Whatcom County Council adopted the update to the [Portage Bay Shellfish Protection District Shellfish Recovery Plan](#) in June 2014. The Shellfish Protection District, along with Whatcom Clean Water Program partners, will continue to move forward with implementing the plan and working with landowners to find and fix sources in the watershed that contribute pollution to Portage Bay.

#### ***Increased local action to address bacteria pollution to shellfish growing areas -***

Whatcom County Council adopted a Water Action Plan resolution during second quarter 2014. The plan acknowledges bacteria pollution to shellfish growing areas as a challenge and is seeking resources to enhance efforts to improve water quality. Whatcom County Public Works and Whatcom County Health Department hosted successful septic system workshops this quarter. Additionally, Whatcom County is forming a stronger partnership with Whatcom Conservation District to enhance opportunities for technical assistance to livestock owners.

## 1. WATER QUALITY MONITORING & RESULTS

**Data reporting** - Whatcom Clean Water Program fecal coliform bacteria monitoring results are reported in colony forming units (CFU) per 100 milliliters (mL) of sample for each sample location. Fecal coliform measured in ditches, streams, and marine water is an indicator of fecal contamination from humans and other warm-blooded animals. State water quality standards include numeric criteria for both marine and fresh waters. Numeric criteria for bacteria can be found in Washington Administrative Code (WAC-173-201A-200 for fresh water and WAC-173-201A-210 for marine water).

**Water quality database** - Whatcom County Public Works hired temporary staff this quarter to enter historic and current water quality data and to develop a guidance manual for Water Resource Inventory Area 1 (WRIA1\*) database users. Lummi Natural Resources staff developed the database for use by the various agencies and organizations who monitor fecal coliform and other water quality parameters in Whatcom County.

### LOWER NOOKSACK/PORTAGE BAY WATERSHED

Fecal coliform density

#### **Monitoring in Bertrand focus area -**

In the Bertrand watershed, Washington Department of Ecology (Ecology), Whatcom County Public Works, and the Nooksack Indian Tribe (NIT) monitor fecal coliform bacteria levels at twelve locations. See Appendix Figure 1 for sampling locations:

- Ecology samples once monthly at ten sites;
- Public Works samples twice monthly at the downstream B1 station (Rathbone Road bridge);
- NIT samples once monthly at SW14 (same location as B1) and at SW13 (H Street bridge).

In addition to the twelve routinely sampled stations, Washington Department of Agriculture (WSDA) Dairy Nutrient Program (DNMP) staff conducted fecal coliform sampling along Jackman Ditch, McClellan Creek and Duffner Creek. See Appendix Figures 2 and 3 for sampling results and a map of sampling locations.

Jackman Ditch is a tributary to Bertrand Creek and is one of the most polluted tributaries of the Nooksack River system. Sampling results at the U.S./Canadian border continues to show that bacteria pollution is flowing from Canada. However, during some sampling events, fecal coliform concentrations increase as water flows downstream in Whatcom County through the dairy fields and roadside ditch system. DNMP staff have been and will continue cooperating with the dairy producers in the area to find and eliminate bacteria contributions that may be coming from dairies.

Fecal coliform sampling results collected by all agencies during April and early May were very high. Department of Ecology's routine sampling in early May found extremely high concentrations in Bertrand Creek; results from ten monitoring stations ranged from 2,200 CFU/100mL to >50,000 CFU/100ml (or reported as "too numerous to count"). The fecal coliform concentration in Bertrand Creek at the U.S. Canadian border was measured at 19,000 CFU/100mL, while the concentration near the mouth of Bertrand Creek where it flows into the Nooksack River was >30,000 CFU/100mL. The pre-scheduled sampling occurred after rain that resulted in significant runoff and high stream flows.

**\*WRIA1**— State natural resources agencies have divided Washington into 62 geographic areas or Water Resource Inventory Areas (WRIAs). WRIA1 includes the Nooksack River basin and certain adjacent smaller watersheds, including the coastal drainages of Dakota and California Creeks (Drayton Harbor watershed).

**Figure 1 - Bertrand Creek fecal coliform monitoring station B1  
Comparison of geometric mean using annual data  
January-June**

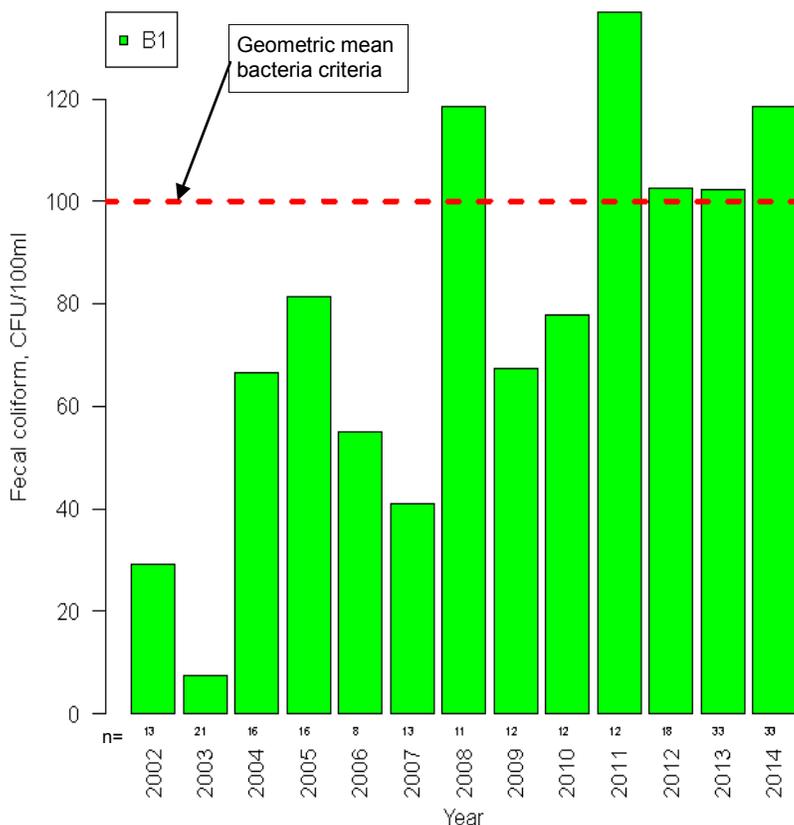


Figure 1 compares the geometric means for the downstream Bertrand mainstem monitoring location B1 using data collected by Whatcom County and the Nooksack Indian Tribe (NIT) for January-June annually.

During the January—June period annually for at least the past four years, the geometric mean value for fecal coliform density at B1 has failed to meet the state bacteria criteria.

Because the frequency of sampling and the entity collecting the water quality samples have periodically changed over time, Figure 1 and Figure 2 note the number of sampling events (n) that are considered in the calculations.

State standards establish that not more than ten percent of all samples obtained for calculating the geometric mean should be more than 200 CFU/100 milliliters (mL) of sample. Figure 2 compares the estimated 90th percentile value for fecal coliform organism levels at Bertrand Creek station B1 using data collected annually by Whatcom County and the NIT for January-June time period.

**Figure 2 - Bertrand Creek fecal coliform monitoring station B1  
Comparison of estimated 90th percentile using annual data  
January-June**

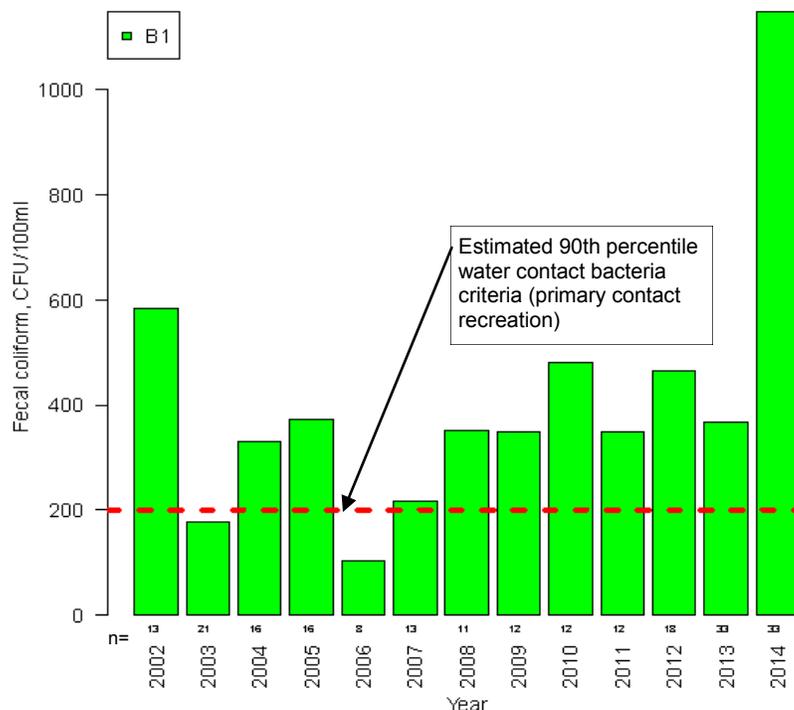


Figure 2 illustrates that in 2014, a greater than 80 percent reduction in fecal coliform concentration is needed for B1 to meet the state criteria.

**Monitoring in Kamm focus area -**

The Kamm Creek watershed was included as a bacteria pollution identification and correction focus area during late 2013 due to consistently elevated fecal coliform concentrations measured during Whatcom County’s routine, long-term, fixed-location sampling.

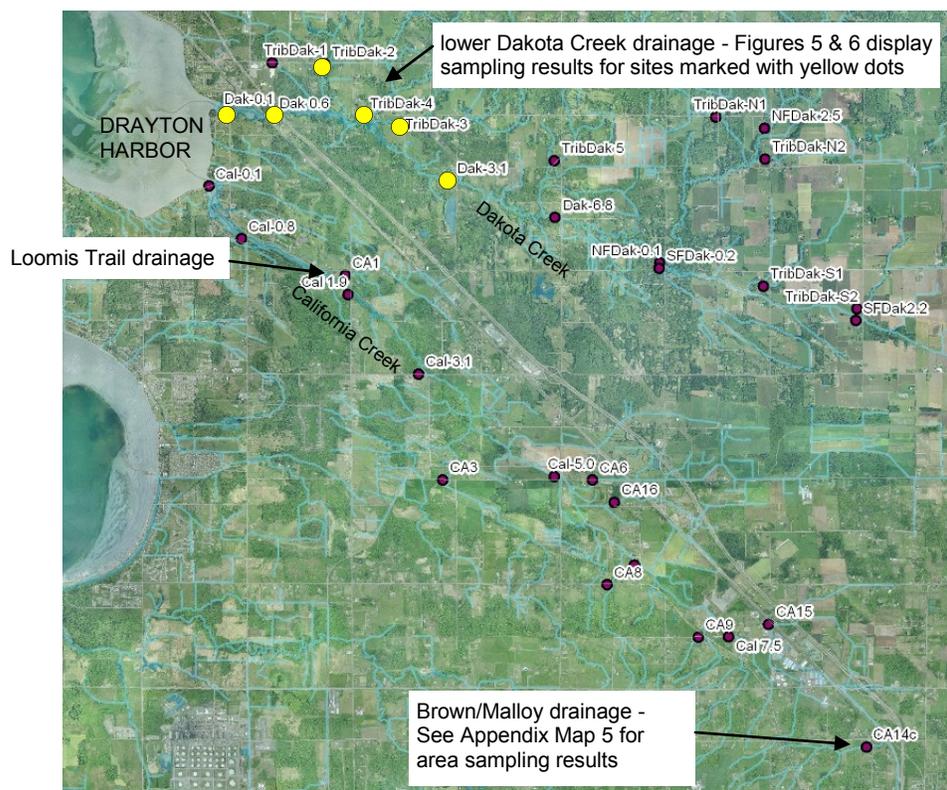
Ecology began routine, twice-monthly fecal coliform sampling in the Kamm watershed during November 2013. Washington Department of Agriculture Dairy Nutrient Management Program sampled at several sites for fecal coliform in April and May, and Whatcom County Public Works maintains a long-term, twice monthly sampling routine at stations K1 and K1a. (See Appendix Figure 4 for sampling locations and results).

K1a is a small tributary creek that flows into Kamm Creek directly upstream of the bridge at Hampton Road. Whatcom County's 2013 Annual Water Quality Report documents that the 2013 and three-year geometric means at K1a were both over three times the water quality criteria established to protect primary contact recreation. Over seventy percent of the samples collected in 2013 exceeded 200 CFU/100mL; the state standard is for not more than 10 percent of all samples collected to calculate the geometric mean be above 200 CFU/100mL.

## DRAYTON HARBOR WATERSHED

### Fecal coliform density

**Figure 4. Drayton Harbor watershed fecal coliform monitoring stations with focus areas identified**



### **Long-term routine sampling -**

Dakota Creek and California Creek are the two main freshwater sources draining to Drayton Harbor.

In the Drayton Harbor watershed, Whatcom County Public Works staff collects routine water quality samples on a monthly basis at approximately 30 stations (see Figure 4). Nooksack Indian Tribe (NIT) Natural Resources staff collect samples twice monthly from additional short-term monitoring sites.

The lower Dakota Creek area draining to monitoring stations TribDak2, TribDak3 and TribDak4 has been a Whatcom County focus for bacteria pollution identification and correction efforts since spring 2013. The small tributaries flowing to lower Dakota Creek have the highest fecal coliform bacteria levels in the Dakota Creek sub-basin (see Figure 5 and Figure 6).

Stations Dak0.1 and Dak0.6 are located near the mouth of Dakota Creek where it flows into Drayton Harbor; these two stations are subject to marine surface water quality standards. Station Dak3.1 is also sampled as station SW38 by the NIT and is located upstream of the lower Dakota Creek focus area.

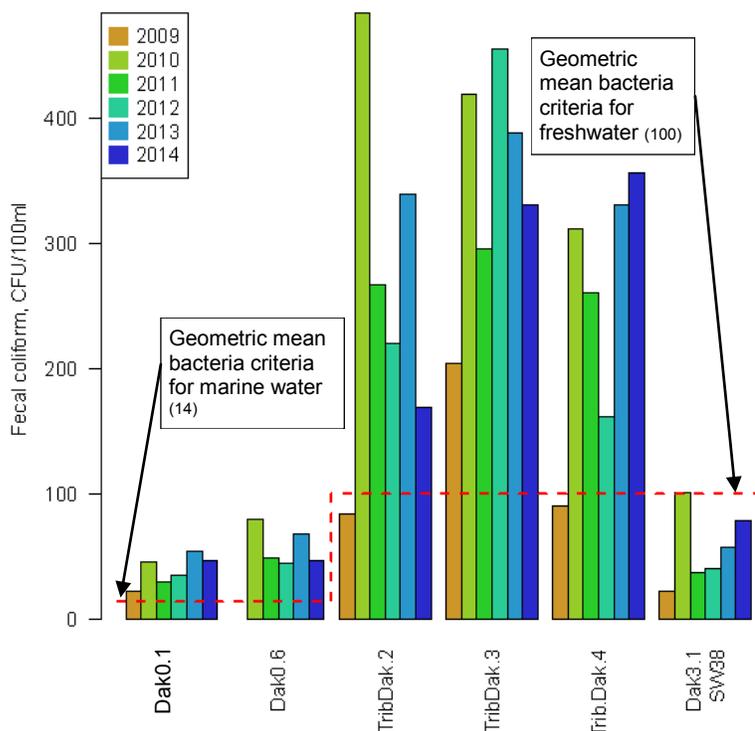
In addition to lower Dakota Creek, Whatcom County's 2013 Water Quality Report identifies two areas that flow into California Creek and eventually to Drayton Harbor as priority areas for fecal bacteria reduction efforts - the Loomis Trail drainage and the Brown/Malloy drainage.

To help identify bacteria source locations, Public Works in late March began weekly fecal coliform monitoring in the three focus areas:

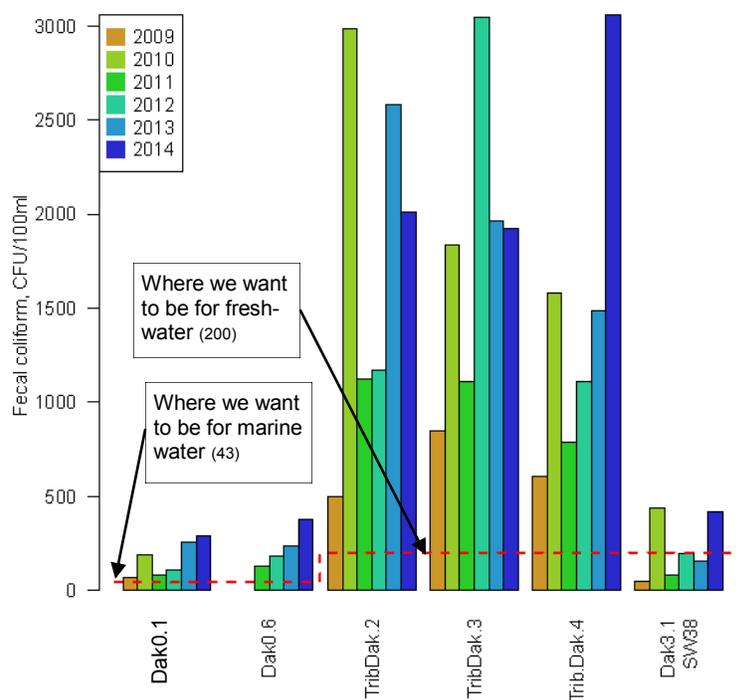
- lower Dakota (11 sites)
- Loomis Trail (7 sites)
- Brown-Malloy (7 sites)

See Appendix Figure 5 for April-June 2014 fecal coliform sampling results in the Brown-Malloy drainage area. Results at each sampling location are reported by date in CFU/100 mL.

**Figure 5 - Drayton Harbor/lower Dakota Creek  
fecal coliform sampling results  
Comparison of geometric mean, annual data Jan-Jun**



**Figure 6 - Drayton Harbor/lower Dakota Creek  
fecal coliform sampling results  
Comparison of estimated 90th percentile, annual data Jan-Jun**



## 2. SITE ASSESSMENTS

### 2.1 Regulatory property assessments and results this quarter

#### **Ecology** (non-dairy livestock properties)

Within the lower Nooksack/Portage Bay drainage, Ecology water quality inspectors have focused bacteria pollution identification and correction efforts in the Bertrand and Kamm sub-basins. Additionally, Ecology inspectors respond to pollution complaints filed through the Environmental Report Tracking System (ERTS). ERTS responses during the last quarter included sites in the Drayton Harbor, Birch Bay, and Sumas River drainages.

#### **Bertrand sub-basin** - 1 site visit, 1 Warning Letter, 1 Notice of Violation:

- Completed one follow-up site visit and issued a warning letter noting that animals had not been excluded from an area saturated during the wet season and contributing to polluted runoff.
- Issued a Notice of Violation to a McClellan Creek area property. Ecology began working with the property owner in spring 2013 and has been offering technical and financial assistance to correct all identified, preventable sources of livestock-related bacteria pollution. The landowner has improved management of manure and pastures, but has not prevented livestock access to surface water and manure accumulations in close proximity to ditches.
- Coordinated with Washington Department of Agriculture Dairy Nutrient Management Program inspectors regarding a property with documented discharges of manure-contaminated water from areas where livestock are confined. As the property is no longer within dairy ownership, Ecology is the lead for correcting the pollution source. Despite contact attempts, the landowner remains unresponsive. The site remains a priority for Ecology follow-up, data collection and potentially escalating enforcement.

- Continued to monitor a previously inspected property. Based on recommendation from an Ecology inspector, the landowner sought technical assistance from Whatcom Conservation District (WCD) to address livestock related bacteria pollution sources.

*Kamm sub-basin* - 5 site visits, 1 Warning Letter:

- Completed a follow-up inspection on a property to monitor progress toward correcting documented polluted discharge from manure storage and the livestock confinement area. The visit confirmed the landowner made partial improvements and is working with WCD to develop a plan to prevent pollution and to install a riparian buffer project through the Conservation Reserve Enhancement Program.
- Inspected two properties associated with a large commercial calf operation. Based on observed conditions and described practices, the property presented low risk of polluting surface water. The inspector recommended the owner evaluate the liquid manure storage structure to ensure the system does not leak.
- Issued a warning letter to a property with visible bacteria pollution discharges including a manure-contaminated muddy confinement area, overgrazed pastures and manure storage areas allowed to discharge to surface water. The landowner is currently working with WCD to develop solutions.
- Inspected a property with observed conditions allowing manure contaminated runoff from confinement area to flow down slope to seasonally-ponded area and discharge to connected surface water. The inspector recommended significant improvements to manure management and to management of the winter livestock confinement area before this fall's rainy season.
- Responded to complaint related to an improper application of manure solids that appeared to result in polluted runoff to surface water. The inspector discussed with the landowner the importance of proper application timing relative to precipitation and saturated field conditions and the importance of maintaining adequate setback distances from surface water in order to avoid polluted discharge. The inspector recommended that livestock brought onto the property in early spring be excluded from seasonal drainages when surface water is present. The landowner is working with WCD for technical assistance.
- Attempted to contact, discuss the bacteria pollution identification and correction program and request a site visit with twelve other residents of high priority sites. Five of the residents have denied property access and seven contacts have yet to respond to requests or have been unable to meet.

*Work in other drainages* -

*Birch Bay/Terrell Creek* - 1 site visit:

- Based on high fecal coliform sampling results from property runoff and observable conditions, Ecology inspectors conducted a site visit. The visit confirmed high animal density with related overgrazing and manure accumulations resulting in polluted discharge flowing from the saturated field areas, a large manure pile and confinement areas. The property owner is working with WCD to pursue structural and management changes to correct the bacteria pollution sources.

*Sumas River* - 1 Notice of Violation, 2 Notice of Penalty:

- Based on lack of progress in correcting identified, ongoing pollution discharges, Ecology issued a Notice of Violation to a property that inspectors have been working with since fall 2012. Overgrazed, muddy, manure-contaminated pastures and a confinement area are allowed to discharge polluted runoff to surface water. Inspectors have visited the site twice, offered financial and technical assistance, and issued two previous warning letters.
- Ecology issued two penalties related to over application of manure that resulted in polluted discharge during September 2013. A \$4000 penalty was issued to the owner of the berry farm property responsible for directing the manure application prior to a significant rain event. A \$4000 penalty was also issued to the business who applied the manure.

Drayton Harbor/California Creek - 2 site visits, 1 Warning Letter:

- Based on a complaint, Ecology inspectors visited a property with significant standing water in the livestock confinement area. The manure-contaminated water is allowed to flow into surface water during rain events. Inspectors recommended improvements and referred the landowner to WCD for assistance.
- Ecology issued a warning letter to a property owner who has continually allowed manure-contaminated pollution to flow from his property. Ecology began notifying the landowner in 2008 of needed corrections to exclude cows from surface water and to prevent polluted runoff from manure storage and manure contaminated fields. The landowner has been unresponsive to requests to work with Ecology and has denied property access. Ecology continues to document discharges and conditions on the property and is escalating enforcement action in order to correct the ongoing pollution to community waters.
- Nine other complaints in the California Creek sub-basin were submitted through the Environmental Report Tracking System (ERTS). Ecology inspectors have met with one landowner and have contacted three others. One landowner is unresponsive. Follow-up will continue this fall.

Drayton Harbor/Dakota Creek - 1 site visit, 1 Warning Letter

- A complaint reported improper application of solid manure to a frozen field in February. The manure was applied by both a dairy and by a non-dairy operation to a field not included in a Dairy Nutrient Management Plan. Ecology inspectors visited the non-dairy operation and found a drainage pipe that apparently discharges polluted runoff into a stream during wet periods. Ecology sent a warning letter to the property to document instructions to avoid risky manure application to frozen ground and to prevent polluted discharge from entering the drain pipe.

**Washington Department of Agriculture (WSDA) Dairy Nutrient Management Program (DNMP) activity: Bertrand Creek and Kamm Creek focus areas (LOWER NOOKSACK/PORTAGE BAY WATERSHED) & DRAYTON HARBOR WATERSHED**

DNMP Activity				
	Lower Nooksack/Portage Bay watershed		Drayton Harbor watershed	Countywide
	Bertrand sub-basin	Kamm sub-basin		
Number of dairy facilities (end of quarter)	14	8	9	109
Number of dairies with fields in watershed	21	11	11	
Number of inspections Quarter 2, 2014				
Routine	0	0	0	4
Close-out	0	0 <sup>1</sup>	0	0
Nutrient Application Assessment (NAAR)	2	3	0	5
Initial	0	0	0	0
Referrals to Ecology or County Health	1	1	11	13
Technical assistance	0	1	0	1
Investigation <sup>2</sup>	2	3	3	11
Follow-up	0	0	0	0

<sup>1</sup> One dairy facility located in the Fishtrap sub-basin closed near the end of the quarter; the dairy's fields drain to Kamm Creek.

<sup>2</sup> Most investigations included more than one visit. One investigation included contacting and working with four dairies.

In cooperation with Ecology inspectors, Dairy Nutrient Management Program (DNMP) staff conducted two aerial overflights this quarter. Flights surveyed priority drainages of Bertrand and Kamm in the lower Nooksack watershed and areas of the Drayton Harbor watershed.

Based on overflight observations, DNMP staff:

- Made contact with five dairies in the priority drainages where facility issues or observed manure application practices presented high risk of discharging bacteria pollution.
- Issued warning letters to two dairies and to a custom dairy nutrient applicator regarding manure applications presenting high risk for polluted discharge
- Continue to use photo evidence to discuss risky manure management practices with dairy operators
- Share with agency partners photo evidence related to non-dairy livestock sites with potentially polluting conditions

DNMP staff identified manure pollution discharges at six dairies this quarter and spent substantial time investigating and preparing compliance action documentation. Additionally, WSDA inspectors continued investigative work with five dairies related to pollution discharges identified during the first quarter of 2014:

*Notice of Penalty -*

- Issued to a dairy in the Fishtrap Creek sub-basin (lower Nooksack/Portage Bay). The penalty was issued in May for a March discharge and settlement negotiations are underway.
- Issued to a dairy in the Terrell Creek drainage, which flows to Birch Bay. The penalty was issued in June for manure discharges from multiple sources occurring during February through April.

*Notice of Correction -*

- Issued to a dairy for March manure application to saturated fields in the Johnson Creek drainage, which flows to the Sumas River.
- Issued to a dairy for April manure application that resulted in polluted discharge to Squaw Creek, which flows to the Sumas River.
- Issued to a dairy for May manure solids application that resulted in discharge to Kamm Creek, which flows to the Nooksack River (Portage Bay).

*Warning Letter -*

- Issued to two different dairies in the Kamm Creek drainage for liquid manure application without adequate setbacks from surface water.
- Issued to two different, independent third party custom manure applicators for manure applications resulting in potential or actual pollution discharge to surface water. One manure application occurred in the Kamm Creek drainage, and the other in the Sumas River watershed.

*Compliance actions are pending -*

- February manure discharge to Dakota Creek (Drayton Harbor)
- April manure discharge in Sumas River watershed
- April discharge from manure stored in silage bunker in the Terrell Creek drainage (Birch Bay)
- May manure discharge in the Tenmile Creek drainage, which flows to the Nooksack River (Portage Bay)

**Whatcom County Health Department (WCHD) - (on-site sewage system (OSS) operation & maintenance) Bertrand Creek and Kamm Creek focus areas (LOWER NOOKSACK/PORTAGE BAY WATERSHED) & DRAYTON HARBOR WATERSHED**

Due to consistently elevated fecal coliform sampling results since March at monitoring station TribDak3d in the lower Dakota Creek drainage, WCHD contacted two properties on Giles Road and Haynie Road requesting OSS evaluations:

- Giles Road - WCHD sent two letters requesting an OSS survey for the property and received no response. Bracketed sampling implicating the property as a potential bacteria pollution source combined with the lack of an Operation & Maintenance (OM) report on file as required for a property in a marine re-

covery area resulted in an Administrative Hearing. The outcome of the Hearing determined that an OSS survey by WCHD staff would be scheduled in July.

- Haynie Road - WCHD sent a letter to the property and completed a flow and dye test. Effluent backed up into the septic tank. WCHD provided a deadline for the property owner to make repairs. An OM Specialist found a clogged outlet baffle filter and a clogged transport line. After cleaning both and conducting a successful flow test, the OM Specialist submitted a satisfactory evaluation report.

WCHD received referrals from WSDA Dairy Nutrient Management Program and from Ecology inspectors regarding potentially polluting OSS:

- Barnhart Road property 1 (Bertrand Creek drainage) - WCHD sent two letters to the property and received no response. WCHD staff visited the property and after a confrontational exchange with the property owner's father, requested that the owner contact WCHD. WCHD has not received a response and functional status of the OSS is unknown. Pending additional information implicating the OSS as a source of bacteria contamination, WCHD is ready to follow up.
- Barnhart Road property 2 (Bertrand Creek drainage) - WCHD sent a letter and performed a flow and dye test. WCHD staff found sewage was surfacing in a localized area at the end of a mound, likely due to a broken lateral line. The owner has contacted a licensed installer to troubleshoot and repair the drainfield, with a deadline at the end of July.
- Jackman Road (Bertrand Creek drainage) - Based on a referral from Ecology inspectors during a previous reporting period, WCHD continued working with a property owner to address the OSS from an accessory structure on the property. A new tank was finally installed, but the installation was done without a permit. WCHD established a deadline at the end of July for the owner to get the tank installation permitted.
- Van Buren Road (Sumas River drainage) - WCHD staff visited the site and confirmed that livestock access to the pressure mound drainfield had exposed the end of one lateral line. WCHD staff sent a letter with a deadline for the owner to re-establish the cover material and install fencing to prohibit future livestock access.
- Grandview Road (Terrell Creek drainage) - WCHD responded to a complaint filed through the Environmental Report Tracking System and performed a flow and dye test on the system. The test revealed a greywater line from the washing machine was surfacing in the yard. WCHD sent an enforcement letter that resulted in the greywater line being plumbed back into the septic tank. A second flow and dye test revealed no surfacing sewage.

WCHD Activity Summary						
Watershed	# of ROSS* - 2nd Qtr	ROSS— maintenance needed	ROSS - Failures	Failures Repaired	Total # OSS	% of total # OSS evaluated
Bertrand/Fishtrap	9	5	0	2	1004	30
Kamm	7	2	0	0	224	36
Drayton Harbor	692	122	2	2	3075	85

\* ROSS = Report of System Status

During first quarter 2014, 29 OSS evaluations were submitted for Drayton Harbor watershed properties. After WCHD sent postcards to property owners during this quarter reminding them of the required deadline for compliance with OSS Operation & Maintenance requirements, almost 700 OSS evaluations were received. WCHD staff hosted three homeowner training classes during second quarter, resulting in a total of 412 property owners trained to perform their own inspections and submit their own system evaluation report.

### 3. EDUCATION & OUTREACH

[Whatcom Clean Water Program website](http://www.ecy.wa.gov/water/whatcomcleanwater/) - (<http://www.ecy.wa.gov/water/whatcomcleanwater/>)

Historically, elevated bacteria levels in local 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. Shellfish protection district advisory committees play a valuable role in developing and carrying out local strategies for addressing bacteria pollution sources.

Bacteria pollution identification and correction (PIC) program enhancement -

*Portage Bay* - The Portage Bay Shellfish Protection District Advisory Committee updated its [Shellfish Recovery Plan](#), originally developed in 1998, and presented the plan to the Whatcom County Council. Whatcom County Council members adopted the updated Shellfish Recovery Plan by resolution on June 17, 2014. The plan's highest priority recommendation was for the County to develop a locally-driven and sustainable bacteria pollution identification and correction (PIC) program.

An effective PIC program described in the shellfish recovery plan calls for monitoring to identify bacteria pollution problem areas, a community outreach program, staff to work with landowners to identify bacteria pollution sources and correct the problems through optional technical and financial assistance. Voluntary program participation by residents is the goal, with compliance and enforcement actions reserved for residents who choose not to correct identified fecal bacteria pollution sources.

*Drayton Harbor* - Whatcom County Public Works (Public Works) has been leading a Community Solutions PIC program since spring 2013 focused on an area of lower Dakota Creek within the Drayton Harbor watershed. As part of its Community Solutions PIC program efforts, Public Works staff developed and distributed a newsletter to landowners in the lower Dakota Creek focus area. The one-page newsletter described fecal coliform bacteria, summarized that the small creeks draining to lower Dakota Creek have the highest bacteria levels in the entire Dakota Creek watershed, and encouraged septic system evaluation and maintenance as one way for residents to contribute to the community effort for clean, safe water.

The newsletter also invited residents to a free on-site sewage system (OSS) workshop in May jointly hosted by Public Works and the Whatcom County Health Department. Due to the overwhelming number of people who wanted to attend the workshop, Whatcom County scheduled another OSS workshop in Blaine in late May. Public Works developed a program offering rebates to property owners who attended the workshop and subsequently paid for evaluation and maintenance activities that support proper OSS function. Public Works distributed 22 rebates during second quarter 2014.

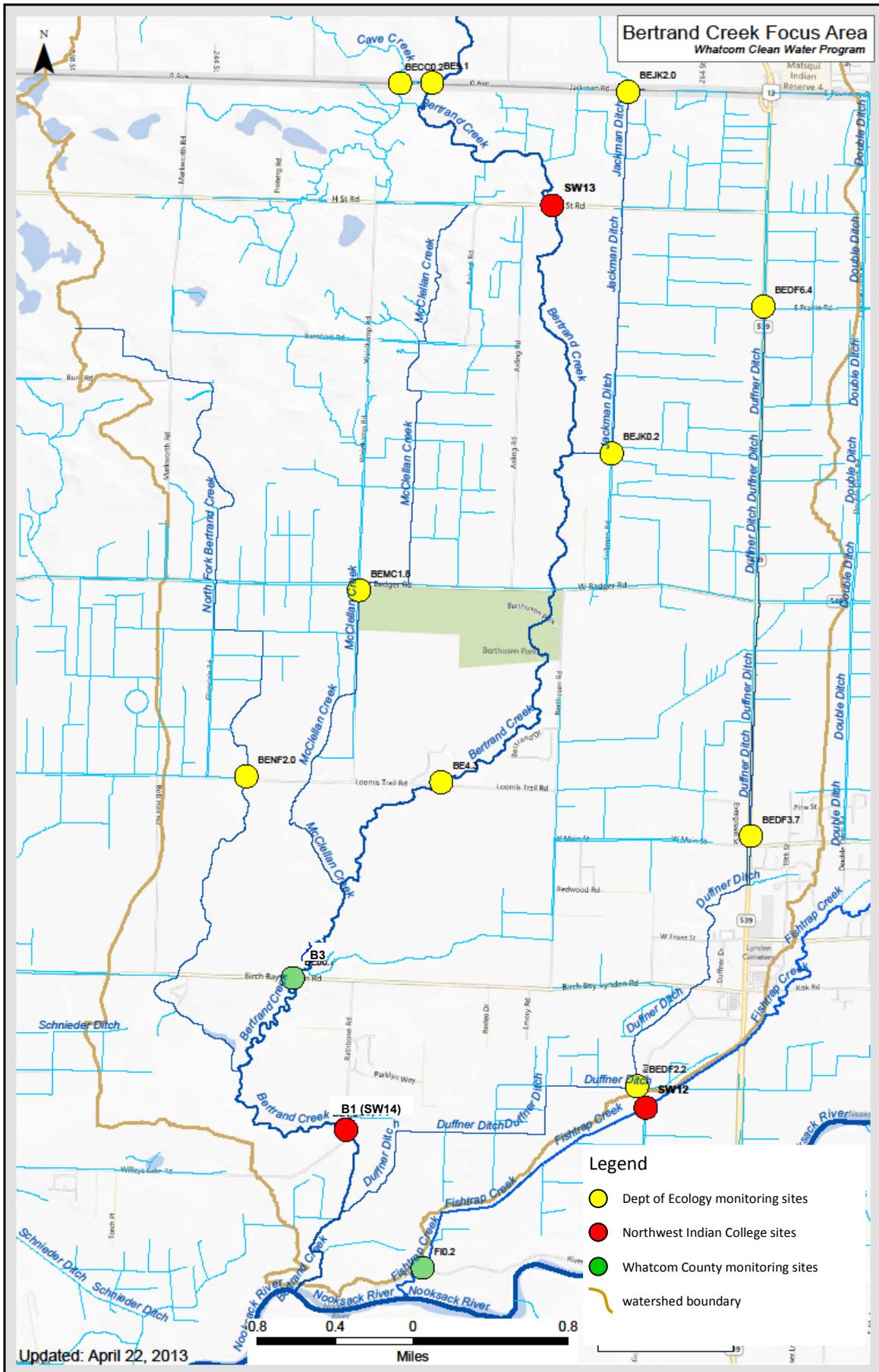
During second quarter 2014, in response to landowner engagement challenges in the lower Dakota Creek focus area and to the Portage Bay Shellfish Advisory Committee's recommendation for a locally-driven and sustainable PIC program, Whatcom County pursued a stronger partnership with Whatcom Conservation District. The County/Whatcom Conservation District partnership is intended to provide direct contact and technical assistance to non-dairy livestock properties in bacteria pollution reduction focus areas. Based on fecal coliform monitoring results, GIS data and windshield surveys, County Public Works has identified high priority parcels with livestock.

Whatcom County Water Action Plan -

Addressing bacteria pollution to shellfish growing areas is an issue identified in the Water Action Plan resolution adopted by Whatcom County Council during second quarter 2014. Whatcom County administration is proposing additional staff to enhance a county-led PIC program. The staff resources would focus on landowner outreach, program coordination and enforcement of existing critical areas ordinance regulations. The program and staff increase is included in the County Executive's 2015 budget proposal. Additionally, Whatcom County submitted a proposal in late June to Washington Department of Health for additional funding to support bacteria reduction efforts in Whatcom County's waterways.



Appendix Figure 1. Bertrand watershed routine water quality monitoring locations



**Appendix Figure 2. Washington Department of Agriculture Dairy Nutrient Management Program (WSDA DNMP) supplemental fecal coliform sampling results - Bertrand watershed (Jackman Ditch, McClellan Creek and Duffner Creek)**

Station ID	Site Type	Lat (WGS 84)	Long (WGS 84)	Location Description	4/4/2014	4/17/2014	5/5/2014	5/9/2014
<b>24 hr precipitation (Inches)</b>					<b>0.00</b>	<b>0.09</b>	<b>1.08</b>	<b>0.13</b>
JD-2.0 <sup>th</sup>	STM	49.002136°	-122.501128°	Jackman ditch at border	48	1,600/2,100	7,800	900
JDSI-4	SIS	48.997129°	-122.501329°	Above lateral ditch coming from lagoon area				280
JD-1.73	SIS	48.996874°	-122.501341°	25 feet South of lateral ditch coming from between lagoons East of Jackman road	94/84	1,600/1,400		
JD-1.5 <sup>th</sup>	STM	48.993533°	-122.501447°	25 feet north of H Street on East side of Jackman road	110	2,600	23,000	800/780
JDSI-3	SIS	48.982762°	-122.501689°	0.73 mi upstream of mainstem. E side of road. Upstream of lateral ditch.				2,100
JD-0.38 <sup>th</sup>	STM	48.977625°	-122.501844°	0.38 mi North of bridge, East side of Jackman road	56	6,100	>50,000/>50,000	2,300
JD-0.2 <sup>th</sup>	STM	48.974964°	-122.502042°	Jackman Road bridge, West side of road	52	6,800	>50,000	1,800
JD-1.1 <sup>th</sup>	STM	49.002181°	-122.490069°	Main ditch flow, 25ft South of Zero Ave at border	74	12,000/9,000	36,000	
JD-0.5 <sup>th</sup>	STM	48.993478°	-122.490650°	25 feet north of H Street at lateral ditch south of BC mushroom farm	72	16,000	33,000	3,600
JDSI-1	SIS	48.993390°	-122.494485°	40 feet W of lateral at telephone pole. N side of H St. Rd.			36,000	
JD-0.34 <sup>f</sup>	SIS	48.993382°	-122.494168°	0.34 mi East of Jackman road ditch along north side H Street road	42			
JD-0.0 <sup>th</sup>	STM	48.993422°	-122.501286°	25 feet East of Jackman road on North side of H Street	41	21,000	30,000	4,400
DF-1	SIS	48.934513°	-122.491927°	East side Duffner bridge on BayLyn Dr.	18			
DF-2	SIS	48.927777°	-122.496115°	East side Schuleyman Rd. at culvert flowing to city stormwater facility	<2	5		
MCIS-1	SIS	48.983260°	-122.545888°	West of dairy on Barnhart Rd. 0.27 mi East of Markworth Rd.		5,500	220,000	
MCSI-2	SIS	48.983111°	-122.539171°	North side of Barnhart, East of dairy, upstream of pond outlet			>50,000	
MCO.0 <sup>th</sup>	STM	48.983195°	-122.538471°	West of pond drain on north side Barnhart road	18	4,000/3,500	>50,000	

<sup>f</sup> sites along (F) lateral ditch (H Street)

<sup>h</sup> Sample locations including environmental parameters tested with Hach HQ40d

STM = Short Term Monitoring Stations

SIS = Source Identification Sampling

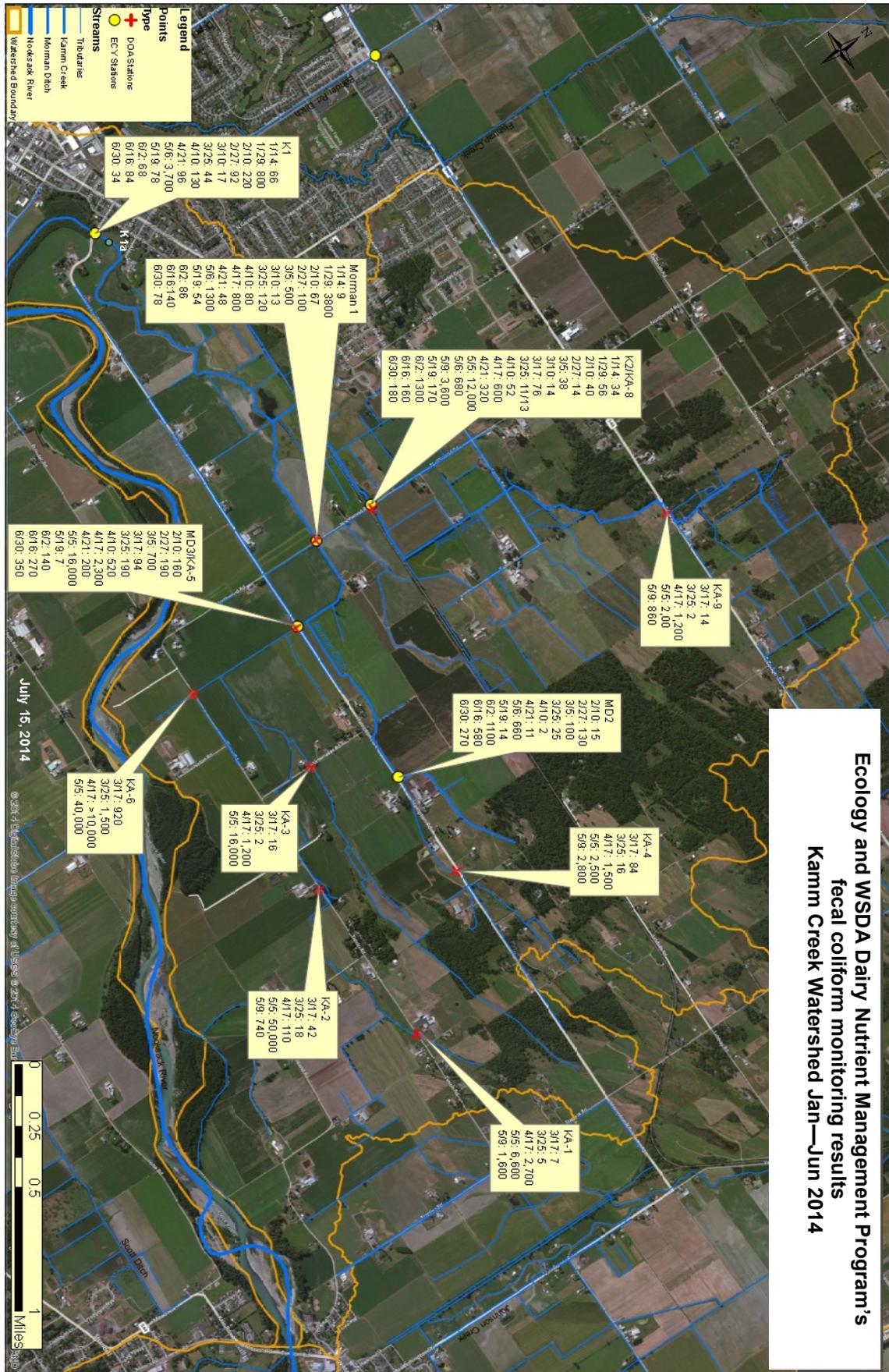
Green = WQ sampling results below 100 colony forming units per 100 ml (CFU/100ml)

Yellow = WQ sampling results between 100-200 CFU/100ml

Red = WQ sampling results above regulatory limit, 200 CFU/100ml



Appendix Figure 4. Ecology and WSDA DNMP fecal coliform monitoring results — Kamm Creek watershed



**Appendix Figure 5. Fecal coliform sampling results Brown-Malloy drainage April—June 2014**

