Whatcom Clean Water Program Quarterly Progress Report
January 1 - March 31, 2015

Quarterly Overview

Program partners continue bacteria pollution identification and correction efforts -

- Pages 2-6 summarize fecal coliform bacteria* sampling efforts and results
- Pages 7-9 summarize property assessments and results
- Pages 9-10 summarize other Whatcom Clean Water Program partner activities

Reclassification of Portage Bay shellfish harvest -
In March, Washington Department of Health finalized the downgrade of 496 acres of commercial shellfish growing area in Portage Bay due to water quality that fails to meet standards established by the National Shellfish Sanitation Program.

Portage Bay is Lummi Nation's shellfish harvest area for commercial, ceremonial and subsistence purposes. The downgrade changed the growing area classification area from "Approved" to "Conditionally Approved." Harvesting in the Conditionally Approved growing area will be closed each year from April-June and again October-December.

Data analysis determined that during those closed months, fecal coliform bacteria pollution in the Nooksack River flowing into the shellfish growing area poses a health risk to people who harvest and eat the shellfish.

Drayton Harbor shellfish harvest -
The Drayton Harbor commercial shellfish growing area continues to be classified as Conditionally Approved. Commercial shellfish harvest is not allowed during the wet season of November-January. With water quality improvements during the rest of the year, the Drayton Harbor Oyster Company is farming oysters for commercial harvest on 30 acres in Drayton Harbor. In February, the Company opened a storefront in Blaine to sell freshly harvested oysters and oyster stew.

Additionally, for the first time since 1999, a recreational shellfish harvest season was announced in March for a section of western Drayton Harbor. The recreational harvest from April 1-October 31 allows the public to legally harvest clams, mussels, and oysters in the designated area. The harvest is subject to emergency closure if there is a spill (e.g. wastewater, manure, oil) or if unsafe levels of marine biotoxins are found.

Viewing shellfish growing area status -
Washington Department of Health has developed an interactive map based viewer for the public to see growing area classifications, marine water quality, commercial harvest site locations and other data. For commercial growing area information, see https://fortress.wa.gov/doh/eh/maps/OSWPViewer/index.html. For information about recreational shellfish harvesting on public and private beaches see http://www.doh.wa.gov/ShellfishSafety.htm.

Program website -
The Whatcom Clean Water Program website - (http://www.ecy.wa.gov/water/whatcomcleanwater/) - contains past quarterly reports, program partner and contact information, a list of frequently asked questions, and other information.

*Fecal coliform bacteria monitoring results are reported in fecal coliform per 100 milliliters of sample for each sample location (FC/100mL).

1. FECAL COLIFORM BACTERIA SAMPLING & RESULTS

LOWER NOOKSACK/PORTAGE BAY WATERSHED
Monitoring fecal coliform density

Several agencies perform fecal coliform (FC) bacteria sampling at various locations in the lower Nooksack River watershed. FC bacteria monitoring results are reported in FC per 100 milliliters of sample for each sample location (FC/100mL).

Whatcom Clean Water Program partner agencies are coordinating activities so that staff sample their sites on the same day once monthly in the Portage Bay watershed and the Drayton Harbor watershed. The coordinated sampling happens on the day prior to when monthly bacteria sampling takes place in the marine water of the shellfish growing areas. Marine sampling dates are scheduled a month ahead of time.

Whatcom County Public Works (Public Works) routinely collects water samples for FC analysis two times per month at fixed location sites in the Nooksack River watershed (Portage Bay Shellfish Protection District). See Figure 1 for January-March 2015 results.

A map of routine sampling sites and monitoring results since January 2014 can be viewed from Whatcom County Public Works Natural Resources webpage at http://www.whatcomcounty.us/1072/Water-Quality.

Figure 1 - Public Works routine fecal coliform sampling results, Nooksack watershed —Quarter 1, 2015

Date	AND	S1	S2	S3	K1	K1a	DDW	DDE	F1	F3	F4	B1	SD	COU2	T1
1/14	22	37	72	74	37	135	40	35	200	37	58	44	32	22	5
1/27	25	62	42	32	240	280	40	10	74	27	45	62	12	14	500
2/2	48	146	52	88	82	410	12,800	12,000	10,300	11,400	40	68	20	40	9
2/24	32	152	104	176	112	60			540	16	32	44	12	24	20
3/10	740	680	480	760	180	120	24	11	52	27	50	5	27	9	14
3/30	70	440	460	860	560	170	100	100	200	160	220	680	120	70	68

indicates result below 100 FC/100mL
indicates result between 100 and 200 FC/100mL
indicates result above 200 FC/100mL

Public Works began FC pollution identification and correction (PIC) efforts in the Fishtrap Creek sub-basin in March. In coordination with the North Lynden Watershed Improvement District (WID), Public Works identified 19 locations to monitor in addition to those already routinely sampled. The additional locations are sampled weekly to characterize smaller creek segments to better identify location of potential pollution sources and target assistance for correcting the source(s). Public Works shares monitoring data with North Lynden WID leadership and with landowners.

To support opportunities for community members to be involved in citizen science through monitoring water quality, the Whatcom Conservation District (WCD) developed Stream Team and backyard monitoring programs. WCD will start these programs in April. Both programs will be coordinated with Public Works routine monitoring program.

Routine water quality sampling conducted by staff from both Public Works and Nooksack Indian Tribe on February 2 and February 3 identified very high fecal coliform levels in Double Ditch (levels ranged from 3100 FC/100mL-12,800 FC/mL: see Fig 1 for Public Works results). The water in Double Ditch originates in Canada, where the waterway is called Pepin Creek. Double Ditch is a tributary of Fishtrap Creek, the Nooksack River and Portage Bay.

The elevated fecal coliform levels detected in Double Ditch on February 2-3 extended in the Nooksack River downstream to Marine View Drive (Public Works sample station M1 - see Fig 2). Other Nooksack River tributaries sampled at the time did not have elevated bacteria levels.

Figure 2 - Public Works routine fecal coliform sampling results, mainstem Nooksack River — Quarter 1, 2015

Date	M5	M4	M2	M1
1/14	5	2	9	2
1/27	4	12	43	38
2/2	2	4	964	560
2/24	8	4	12	16
3/10	5	2	9	5
3/30	5	5	90	74

Department of Agriculture, Dairy Nutrient Management Program (DNMP) staff routinely sample for FC density in water at locations related to dairy nutrient land application acreage. DNMP staff also monitor sites along the US-Canada border to account for FC pollution flowing into Whatcom County from Canada Bertrand Creek and Fishtrap Creek systems). During January through March 2015, DNMP staff sampled:

- Bertrand Creek sub-basin at border and Jackman Ditch drainage - 8 times
- Kamm Creek - 6 times
- Double Ditch/Fishtrap drainages - 7 times (see summary below regarding February sampling)

Early February high FC levels in Double Ditch (see Fig 1 for Public Works 2/2/2015 sampling results) - DNMP staff led follow-up monitoring and communication with Canadian counterparts:

- Feb 4 – Whatcom Clean Water Program agency partners received preliminary sampling results from 2/2
- Feb 5 - DNMP staff conducted follow-up sampling. Results showed elevated results from the US-Canada border downstream through Fishtrap Creek.
- Feb 6 – DNMP coordinated with Whatcom Clean Water Program partners and contacted B.C. Ministry of the Environment to report the apparent significant discharge to Pepin Creek drainage.
- Feb 9 – DNMP provided FC sampling results to B.C. Ministry of the Environment Emergency Management (EM) program. The EM program contacted representatives in Abbotsford and Langley Township.
- Feb 10 – DNMP follow-up sampling on Canadian side of border resulted in 210 FC/100mL.
- Feb 18 – A provincial Environmental Protection Officer contacted DNMP staff with follow-up sampling results. Only one ditch draining to Pepin Brook had resulted in a fecal coliform count above U.S. standards. (230 FC/100mL). Pepin Brook at the border was 54 FC/100mL.
- Mar 3 – B.C. Ministry of the Environment personnel contacted DNMP staff. DNMP staff started a round of five sampling events at four stations to meet the Canadian regulatory minimum of five samples within 30 days to determine a geometric mean.

Canadian authorities did not identify a source to explain the early February very elevated FC levels. DNMP staff will continue to sample in Pepin Creek at the border.

Surveillance flights - DNMP staff led two aerial surveillance flights during the quarter.

- January flight - Of 15 dairies viewed in Bertrand and Kamm drainages, DNMP staff observed one dairy issue of concern. Of 16 non-dairy livestock operations photographed, DNMP staff referred five properties to Ecology for follow-up due to pollution concerns.
- February flight - Of 11 dairy operations viewed in Bertrand and Kamm focus areas, two had observable pollution concerns. DNMP photographed and referred one non-dairy property to Ecology for follow-up.

Department of Ecology (Ecology) conducts routine sampling, source identification sampling (SIS) and compliance sampling in focus sub-basins. Focus sub-basins include Bertrand, Kamm and Scott Ditch. Ecology added Scott Ditch as a focus area in early March 2015. See Figures 3-5 for results from routine sampling.

Ecology inspectors use results from SIS to help determine location of fecal coliform pollution sources within specific reaches of stream, from individual properties and from specific sources within properties. Potential human-influenced pollution sources targeted for correction in focus areas include failing onsite sewage systems, non-dairy livestock, and/or land application of manure.

Ecology conducts most SIS during storm events; SIS sampling during the quarter was primarily focused in the Kamm Creek sub-basin (see Fig 6 for summary).

Fig 3 - Ecology routine fecal coliform sampling results - Bertrand

Date	B1	BEMC 1.8	BE9.1 Bertrand @ border	BECCO.2 Cave Creek @ border	BEDF2.2
1/14	37	100	72	20	32
2/2	27	54	92	27	40
3/9	25	46	270	35	19

Fig 4 - Ecology routine fecal coliform sampling results - Kamm

Date	K0	MD1	K2	K3	MD2	K6
1/14	35	60	20	14	460	9
1/27	280	320	320	35	3700	14
2/2	94	200	35	44	300	2000
2/20	44	44	12	2	530	2
3/9	72	250	30	23	3600	50
3/23	310	350	96	12	3400	

Fig 5 - Ecology routine fecal coliform sampling results Scott Ditch

Date	SD1	SD2	SD3	SD4	SD5	SD6	SD7	SD8
3/9	390	52	17	25	28	280	30	66
3/30	440	430	270	15	62	682	72	86

Ecology inspectors participated in an aerial surveillance flights with DNMP staff. The surveillance flight resulted in Ecology confirming one landowner had installed recommended best management practices (BMPs) and two properties had ongoing polluting conditions. Ecology inspectors used aerial photos to:

- Communicate concerns to eight landowners.
- Contact, inspect and confirm significant pollution discharges from a beef cattle operation in the Silver Creek sub-basin. Ecology recommended the landowners contact Whatcom Conservation District (WCD) for help in addressing polluting conditions. After assessing options, landowners chose to remove cows from the property.
- Refer a property in Kamm Creek drainage to the EPA. EPA attempted to inspect the property, but landowner was not available.

Fig 6 - Ecology source identification sampling summary - Kamm Creek

1/23	Sampled Morman Ditch and tributaries upstream of MD2 in response to high results during routine sampling (see Fig 3). SIS results narrowed source location to dairy heifer facility on Hampton Rd.
1/27	Sampled Kamm Rd and Timon Rd tributaries
2/2	Sampled upstream and downstream of Hampton Rd dairy heifer facility. High fecal coliform results support possible pollution source within property.
3/10	Sampled multiple points within dairy heifer facility property. Results indicate possible lagoon source.
3/20	Samples collected from catch basin indicate high fecal coliform concentrations coming from Timon Rd farm property. Ecology sent warning letter. Aerial photos identified another property as potentially polluting; SIS results showed high fecal counts in the 500s.
3/23	Sampled runoff from farm that denied access to Ecology inspectors. Result was 250 FC/100mL.
3/25	Sampled tributaries to Kamm Creek at Kamm Rd due to two upstream farms with visibly poor conditions likely to contribute pollution. Results ranged from 430-590 FC/100mL.
3/30	Sampled outflow of dairy heifer facility upstream of MD2. Results was 8,700 FC/100mL

Nooksack Indian Tribe (NIT) Natural Resources Department staff collect water quality data at fixed locations monthly in the Nooksack watershed. Fig 7 reports FC sampling results (FC/100mL) this quarter.

- SW11 = Fishtrap Creek at Northwood Rd bridge
- SW12 = Fishtrap Creek at Flynn Rd bridge
- SW13 = Bertrand Creek at H St bridge
- SW14 = Bertrand Creek at Rathbone Rd bridge
- SW15 = Tenmile Creek

Fig 7– NIT fecal coliform sampling results Nooksack watershed

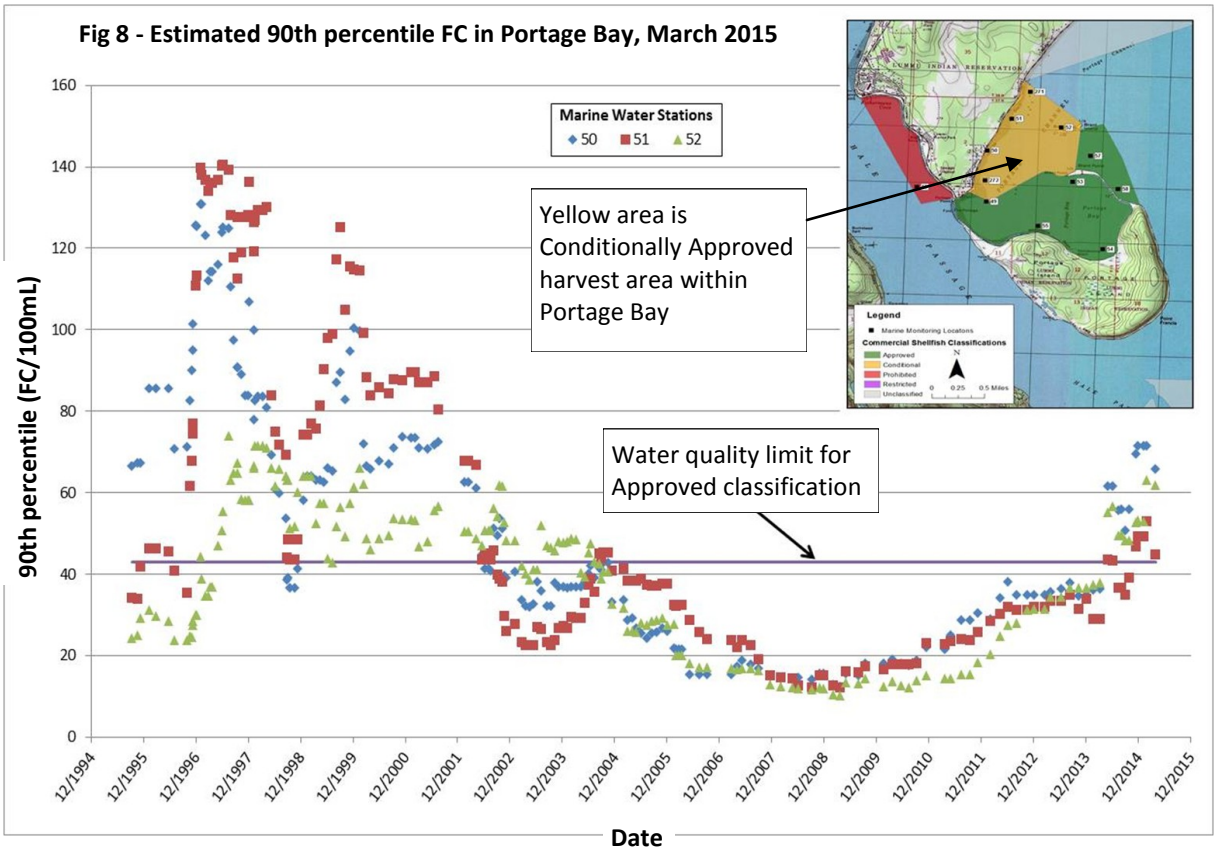
Date	SW11	SW12	SW13	SW14	SW15
1/14	10	72	98	235	3
2/3	28	3100	400	100	215
3/30	54	340	380	490	46

Lummi Nation Natural Resources staff also collect water quality samples in the lower reaches of the Nooksack River watershed.

Portage Bay shellfish growing area downgrade - To protect public health, Lummi Nation in September 2014 voluntarily closed 335 acres of the tribe's Portage Bay shellfish growing area to commercial, ceremonial and subsistence shellfish harvest. This closure was in response to three marine water quality stations failing the National Shellfish Sanitation Program (NSSP) FC water quality standards. Continued high FC counts in Portage Bay led to five marine water quality stations failing the NSSP standards by the end of 2014.

In March 2015, the state Department of Health finalized the downgrade of 496 acres of Portage Bay growing area from Approved to Conditionally Approved. The Conditionally Approved area is closed to harvest for six months of the year, from April-June and October-December annually (see Fig 8 for FC data trend and map).

To view a larger, interactive map based viewer, see https://fortress.wa.gov/doh/eh/maps/OSWPViewer/index.html. The map shows growing area classifications, marine water quality, commercial harvest site locations and other data. (For recreational shellfish harvesting on public and private beaches go to http://www.doh.wa.gov/ShellfishSafety.htm.)



DRAYTON HARBOR WATERSHED

Monitoring fecal coliform density

Whatcom County Public Works (Public Works) coordinates regular monitoring of FC at approximately 30 fixed location sites within the Drayton Harbor watershed. A map of routine sampling sites and monitoring results since January 2013 can be viewed from the Public Works Natural Resources webpage at http://www.whatcomcounty.us/1072/Water-Quality.

As part of Whatcom County's pollution identification and correction (PIC) program, Public Works conducted weekly monitoring at 24 sites in Drayton Harbor focus areas of Lower Dakota Creek, Loomis Trail and Brown-Malloy drainages throughout the reporting period. Water quality data is shared with landowners.

Nooksack Indian Tribe (NIT) also collects water quality data at sites within the Drayton Harbor watershed to supplement data collected by Public Works in PIC focus areas. Figures 9 and 10 report NIT FC sampling results at sampling sites within the Drayton Harbor watershed.

Fig 9– NIT fecal coliform sampling results

	California Creek sub-basin								
	Brown-Malloy							Loomis Trail	
Date	SW26	SW28	SW29	SW30	SW31	SW44	SW46	SW37	SW41
1/5	2300	220	480	290	9800	5000	7800	4500	
1/6									90
1/19	210	114	50	52	430	330	220	63	30
2/11	3300	33	74	54	104	72	44	23	40
3/11	104	20	260	23	340	220		76	108
3/25	600	490	360	510	420	837	480	137	450

Fig 10– NIT fecal coliform sampling results

	Lower Dakota Creek sub-basin				
Date	SW19	SW20	SW21	SW22	SW38
1/6	2200	550	746	520	2600
1/20	23	41	20	27	48
2/10	230	210	200	140	200
3/26	1128	420	250	240	400

Public Works staff has characterized land use in the three Drayton Harbor focus areas. Upstream of areas with consistently elevated fecal coliform levels, Public Works identified potential pollution source properties with non-dairy livestock and outdated septic system evaluations and worked with Whatcom Conservation District and County Health to follow up with property owners.

Drayton Harbor shellfish growing area - The state Department of Health's annual growing area review examined data through December 2014 and concluded that all stations in the harbor's Conditionally Approved harvest area met Approved water quality standards when the area is in Open status. The growing area is closed annually during the months of January, November and December due to FC levels above water quality standards.

During the three-month Closed period, all stations in the Conditionally Approved area are impacted but improving. Station 6 is "Concerned" with a 90th percentile of 21.6 FC/100mL (see https://fortress.wa.gov/doh/eh/maps/OSWPViewer/index.html for map and more information for the commercial shellfish growing area).

At the end of March 2015, local media announced the pending recreational shellfish harvest in West Drayton Harbor. For the first time since 1999, starting April 1, the public can legally harvest clams, mussels and oysters in a section of West Drayton Harbor. The season is scheduled to remain open until October 31 unless there is an emergency closure due to a spill (e.g. wastewater, manure, oil) or to high shellfish biotoxin levels.

2. PROPERTY ASSESSMENTS & RESULTS

Ecology *(non-dairy livestock properties)*

In addition to sampling for fecal coliform and conducting inspections, Ecology inspectors interact with landowners to track pollution sources, communicate data and help landowners make improvements to correct pollution sources. Landowner contacts included 39 phone calls, letters and emails and eight meetings. Ecology issued one warning letter during the quarter to a landowner in the Anderson Creek drainage.

Ecology inspectors completed 11 initial inspections and 4 follow-up inspections this reporting period:

- Nine initial inspections of properties within the Nooksack watershed
- One initial inspection in Lummi Bay watershed
- One initial inspection in Drayton Harbor watershed
- Follow-up inspections occurred on properties in Bertrand, Fishtrap, and Kamm focus areas

During the quarter, Ecology inspectors confirmed that landowners implemented 11 best management practices (BMPs) to prevent manure-contaminated muddy areas from discharging to waterways, control animal access or proximity to waterways, and improve timing and placement of land-applied manure to prevent pollution discharge to waterways. Active management by landowners also included collecting and properly storing manure to prevent polluted runoff to waterways.

See Appendix Table 1 for a summary of Ecology inspector response to 11 Environmental Report Tracking System (ERTS) reports.

Department of Agriculture Dairy Nutrient Management Program (DNMP)
(dairy operations)

DNMP inspection activity included 11 inspections of dairy operations within focus areas of Bertrand and Kamm sub-basins (see Fig 11 for summary).

Countywide, outside of focus areas, DNMP staff conducted 13 routine inspections, three follow-up inspections and seven investigations. Staff determined two ERTS reports were unfounded.

DNMP enforcement activity included warning letters, Notices of Correction and Notices of Penalties:

- 7 Warning Letters to producers addressing -
  - ERTS report submitted by Ecology related to poor pasture/animal management
  - ERTS report submitted by Ecology for land application of solid manure to areas that flood/saturated field conditions
  - Identified facility discharge, but corrected prior to visit
  - Application of solid manure to field that subsequently flooded
  - Problem with silage leachate collection system
  - Lack of lagoon management
  - Incomplete containment with potential to discharge
- 3 Notice of Correction to producers addressing:
  - Manure lagoon overtopping
  - Lack of livestock exclusion fencing (prevent livestock access to surface water)
  - Lack of complete manure containment

- 2 Notice of Penalty to producers addressing:
  - Manure lagoon leak that discharged to surface water
  - Discharge to surface water; producer appealed the penalty and settlement proceedings are underway

U.S. Environmental Protection Agency (EPA)
In late March, EPA issued a compliance order and a $7,500 penalty to a dairy operator in the Fishtrap Creek watershed for violations of the Clean Water Act. The order and penalty resulted from a pollution discharge observed by EPA staff during a 2013 inspection of the dairy facility.

Whatcom County Public Works/ Whatcom Conservation District *(Pollution Identification and Correction (PIC) program)*

Landowner contact in Drayton Harbor watershed- Public Works staff sent 456 letters to residents in the Drayton Harbor focus areas to introduce the County-led PIC program. Signed by the Whatcom County Executive and Whatcom County Council Chair, the letter invites all residents to be a part of the effort to reduce fecal coliform levels in neighboring waterways through addressing sources such as septic systems, livestock, pets and urban wildlife.

Following the introductory letter, Public Works staff sent 50 letters to properties with non-dairy livestock. The letter offered non-regulatory technical assistance from WCD to assess potential livestock-related bacteria sources.

WCD followed up with contact to 38 landowners, 22 of whom are participating in the non-regulatory technical assistance program (see Fig 12 for activity summary).

One landowner in the Brown-Malloy focus area has worked with WCD to identify an exclusion fencing project and submit an application for County cost-share funds.

In March Whatcom County hired a full-time employee in the Planning and Development Services department to support enforcement of the county's

Fig 11– DNMP focus area inspection summary

Bertrand sub-basin	
Inspection Type	**Outcomes**
Routine	Warning letter concerning pasture management. Referred to WCD for help with manure containment at remote facility.
Routine	No issues identified.
Routine	Regulatory technical assistance regarding silage leachate collection.
Investigation	Recommendation for Enforcement pending for lack of complete manure containment.
Investigation	Regulatory technical assistance regarding fall and winter manure applications.
EPA Joint Inspection	Warning letter regarding silage leachate collection system.
Nutrient Application Assessment Report	Regulatory technical assistance regarding manure application viewed during aerial surveillance.
Kamm sub-basin	
EPA Joint Inspection	Lagoon leak to ground identified, stopped prior to inspection. Recommendation for Enforcement pending.
Investigation	Facility discharge identified, fixed prior to inspection.
Follow-Up	Closing of investigation on self-reported facility discharge at milking facility.
Follow-Up	Lagoon assessment of storage capacity and management plan.

Fig 12– County-led PIC program activity summary

Drayton Harbor focus area		
# landowners participating in technical assistance program	22	
# of farm plans completed	2	
# of BMPs installed	2	BMPs include irrigation management and nutrient management
# of BMPs planned	5	BMPs include prescribed grazing (1.3 acres), roof runoff structure, livestock exclusion fencing (1860 ft), nutrient management (5 acres), and irrigation management (1 acre)
Portage Bay focus area		
# landowners participating in technical assistance program	3	

Critical Areas Ordinance Conservation Program on Agricultural Lands program. Whatcom County also added a full-time employee in Public Works to assist with landowner contacts, water quality monitoring, and tracking progress.

Landowner contact in the Lower Nooksack/Portage Bay watershed -
To begin County-led pollution identification and correction (PIC) work within the Fishtrap Creek drainage, Public Works characterized land use in the sub-basin using historic data and through discussion with the North Lynden Watershed Improvement District (WID).

WID members, Public Works staff and WCD staff are working on a collaborative monitoring and community engagement process for the Fishtrap drainage. The process will include a strategy for contacting landowners near locations where monitoring results show high concentrations of FC bacteria.

Public Works staff sent 330 letters to residents in the Fishtrap Creek focus area to introduce the County-led PIC program.

Whatcom County Health Department (WCHD) *- (on-site sewage system (OSS) operation & maintenance)*

Public Works and WCHD staff continued to coordinate a program offering rebates to residents who participate in on-site sewage system (OSS) operation and maintenance workshops. Workshop participants who subsequently have their OSS inspected, pumped or otherwise maintained (e.g. installation of new baffles, risers and lids) are eligible for a $100 rebate from Whatcom County.

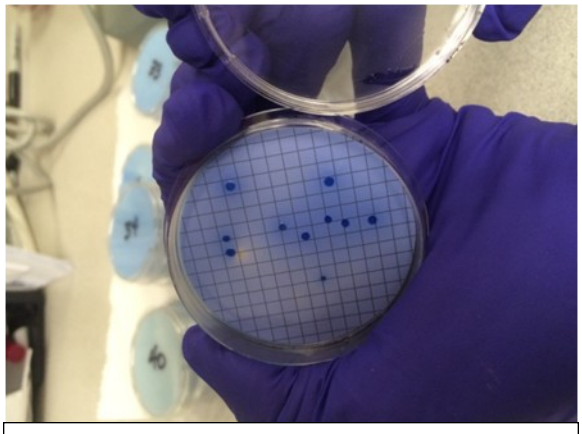
Whatcom County residents submitted 24 rebate applications during this reporting period. A total of 70 landowners have received a rebate through this program.

3. OTHER ACTIVITIES

Outreach, collaboration and coordination

As part of PIC program efforts, staff from WCD and Whatcom County departments of Public Works, Planning and Development Services, and Health meet monthly to review progress, successes, challenges and next steps in order to adapt the program and landowner contact strategies based on field experiences and community discussions.

- Public Works staff made presentations to the Whatcom County Council, shellfish protection district advisory committees, the Whatcom County Agriculture Advisory Committee, Watershed Improvement District (WID) members, Haynie Grange members and to attendees of the Bellingham Bay Symposium.
- WCD staff presented information to WID members, Drayton Harbor Shellfish Advisory Committee, and Haynie Grange members. Staff also attended and answered questions at an Agricultural Advisory Committee meeting and at shellfish protection district advisory committee meetings. At community events, WCD staff hosted informational booths at Wings over Whatcom in Blaine, at the North Sound Environmental Conference, and at the annual WCD native plant sale.
- WCD produced and distributed a Winter 2015 newsletter to



Fecal coliform bacteria from a water sample form colonies to be counted by the lab technician

3000 landowners. The newsletter included information about the locally-led PIC program and opportunities for non-regulatory technical assistance.

- Public Works and WCD staff have created and updated educational materials and websites to provide landowners with information about water quality in neighborhood creeks and options for improving and protecting water quality.
- Washington Conservation Commission continued facilitating a Coordinated Resources Management (CRM) process with the WIDs, WCD, Washington Dairy Federation and Whatcom County. The CRM process seeks to engage community members and to work on resource improvement solutions in the Nooksack watershed. County Public Works, County Health, WCD, DNMP and Ecology staff are working with WID members in a technical advisory role to promote PIC program effectiveness.
- DNMP staff provide information to producers and the local community about the program's work. Staff participated in a Portage Bay Shellfish Protection District subcommittee meeting and a Tenmile Clean Water Project meeting, both which featured dairy nutrient management planning as the topic.
- In response to community questions about *Klebsiella* as a component of fecal coliform (FC) bacteria being measured in local waterways, several Whatcom Clean Water Program partners met in this quarter to discuss and better understand FC laboratory analysis methods. A Washington Department of Health fact sheet regarding *Klebsiella* and its relationship to commercial shellfish classification is included in this report as Appendix Figure 1.
- In February, Ecology staff met with representatives from the Cattlemen's Association (Whatcom and Skagit counties) to discuss water quality improvement efforts and partnership opportunities. At a March Whatcom Cattlemen's Association meeting, the group discussed a draft guidance[1] document produced by a statewide Agriculture and Water Quality Advisory Committee. The guidance describes how Ecology field staff evaluate streamside vegetation and document site conditions known to contribute to water pollution.
- In March 2015, a Whatcom Watersheds Information Network (WWIN) meeting featured FC pollution reduction projects and programs as a topic. State Department of Health staff presented Whatcom Clean Water Program (WCWP) FC pollution reduction efforts to the group.

  In addition to WCWP, five other groups presented FC bacteria pollution reduction programs focused on areas of Whatcom County from the north in the City of Blaine (Drayton Harbor and Semiahmoo Bay watersheds) to the south in North Chuckanut Bay watershed. Four of the programs target urban/suburban FC bacteria pollution sources such as sewer leaks/cross connections, dog waste, and urban wildlife.

The Drayton Harbor/Semiahmoo Bay Water Quality Enhancement Project (http://ci.blaine.wa.us/804/Cain-Creek) was one fecal coliform bacteria reduction project featured at a March WWIN meeting.

[1] An online version of the draft guidance document can be viewed from a Department of Ecology Clean Water on Agricultural Lands webpage (http://www.ecy.wa.gov/programs/wq/nonpoint/Agriculture/Wtrshedsurveys.html). Click on the "draft guidance" link within the **Landowner resources** section (http://www.ecy.wa.gov/programs/wq/nonpoint/Agriculture/GuidanceDocdraftJan2015Clean.pdf).

Appendix Table 1 - Ecology Environmental Report Tracking System (ERTS) report summary

Lower Nooksack sub-basins	Source of report	Action	Status
Silver Creek	WSDA – aerial surveillance	Inspected and confirmed significant polluted discharges from beef cattle operation. Landowner met with Whatcom Conservation District (WCD).	Landowner chose to remove livestock from the property. Resolved.
Anderson Creek	WSDA – improper manure application	Inspected and confirmed manure discharge. Issued warning letter.	Landowner agreed to use better manure application practices in the future. Follow-up required.
Kamm Creek	WSDA – aerial surveillance	E-mailed landowner reminding of agreement to remove livestock from saturated pastures discharging to streams, and to implement BMPs for heavy use areas by March 30.	No response from landowner. Follow-up required.
Kamm Creek	WSDA	Contacted landowner regarding application of solid manure to field too close to surface water.	Landowner agreed to avoid high-risk manure applications. Follow-up required to ensure use of proper setbacks.
Fishtrap Creek	WSDA	Conducted two inspections. Landowner agreed to implement recommended setbacks from surface water and to work with WCD.	Conditions have not improved. Follow-up required.
Tenmile Creek	Anonymous – cattle access to saturated pasture	Conducted inspection. Confirmed cattle had access to saturated pastures flowing to Tenmile Creek. Landowner removed cattle from saturated pastures and is working with the WCD.	Landowner agreed to submit a farm plan to ECY within 30 days. Follow-up required confirming farm plan development & implementation.
Tenmile Creek	Anonymous – horse boarding facility discharging polluted runoff	Conducted inspection. Owner agreed to contact and work with WCD to prevent polluted runoff from flowing to adjacent surface water.	Follow up required
Tenmile Creek	WSDA – possible improper manure application to berry field	Met with landowner on site. Follow-up verified that no manure was applied.	Resolved
Tenmile Creek	WSDA – heifer operation applied manure to field that was then flooded	Conducted inspection and observed from road. Sampled runoff to confirm pollution discharge.	Owner agreed not to apply manure to frequently flooded area during wet season. Follow- up required to ensure proper application practices.
Fourmile Creek	WSDA – manure pile placed in close proximity to surface water	Inspected and confirmed a large manure pile with no BMPs in place to prevent polluted runoff to a nearby ditch flowing to Fourmile Creek. Landowner installed a berm to prevent polluted runoff and indicated the pile was temporary.	Poor pasture conditions have not improved. Warning letter pending.
Drayton Harbor sub-basin	**Source of report**	**Action**	**Status**
California Creek	WSDA – cattle confined in close proximity to surface water	Conducted inspection and found no evidence of polluted runoff.	Follow up required to observe summer pasture conditions

Appendix Figure 1—*Klebsiella* fact sheet

Klebsiella

How this bacteria relates to commercial shellfish classifications

Washington State Department of Health

In the Environment

Klebsiella are one of many bacteria categorized as fecal coliform bacteria. They can be found in animals, people, water, soil, and plants. About 30 to 40 percent of all people and animals have *Klebsiella* in their intestinal tract, which come out in feces. There can be up to 100,000,000 *Klebsiella* per gram of feces (American Water Works Association, 1999).

Potential Public Health Impact

Klebsiella can make people sick, and even cause death, when ingested in large numbers or by people who have a health condition that makes them vulnerable (i.e. immunocompromised). Many studies have shown that, in general, strains of this bacterium from plants, soil, or water are as likely to cause illness as those from animals or people (Struve, 2004). Estimates are that ingesting 100 ml (about 3 oz.) of drinking water containing 35 *Klebsiella* per ml could be a risk to susceptible people (American Water Works Association, 1999). Foodborne illness outbreaks linked to *Klebsiella* have also been reported (from contaminated iced tea (Tauxe, 1996) and turkey (Rennie, 1990)).

Relationship to Commercial Shellfish Classifications

National Shellfish Sanitation Program (NSSP) rules require the use of fecal coliform bacteria when evaluating marine water quality for the classification of commercial shellfish harvesting areas. Fecal coliform bacteria are used as an indicator of the potential presence of harmful bacteria or viruses.

We received guidance from the U.S. Food and Drug Administration (FDA) on the evaluation of wastewater containing *Klebsiella* bacteria (i.e. from pulp mills). The key points of FDA's guidance (FDA, 2003) on application of the NSSP rules related to this issue include:

- The NSSP does not allow a State Shellfish Control Authority to distinguish among types of fecal coliforms when making regulatory decisions. We must treat *Klebsiella* the same as other fecal coliform bacteria – there are no criteria for exceptions in NSSP rules.
- We measure indicators, not actual pathogens. Using fecal coliform bacteria as an indicator organism provides notice of many potentially harmful bacteria and viruses in the water. Fecal coliform is considered to be reliable indicator: it produces quick results, is relatively inexpensive, has reproducible results, and can be uniformly applied on an interstate and international basis.

References

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4. Struve, C. and K.A. Krogfelt. 2004. Pathogenic potential of environmental *Klebsiella pneumoniae* isolates. Environmental Microbiology (2004) 6(6), 584-590.
5. Tauxe, R.V. and M.L. Cohen. 1996. Bacterial contamination of iced tea. (Technical memorandum). Centers for Disease Control and Prevention, Atlanta, GA.