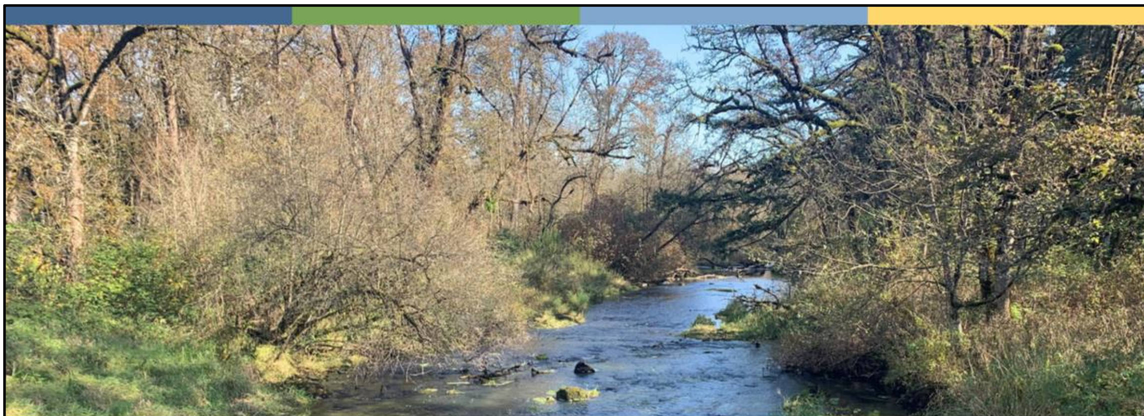

Lacamas Creek Source Assessment

May 5, 2021

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DEPARTMENT OF ECOLOGY State of Washington

I. Background
II. Source Assessment
III. Preliminary Results and 2021 Monitoring

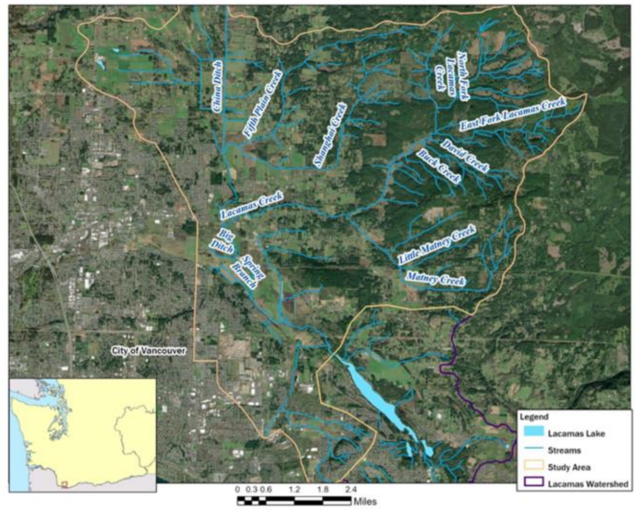
Lacamas Creek Watershed

Lacamas Creek's Major Tributaries:

- China Ditch
- Fifth Plain Creek
- Shanghai Creek
- Matney Creek
- Dwyer Creek

Mixed land uses

- Agriculture
- Commercial
- Residential
- Industrial
- Forested



The Lacamas Creek watershed is located in Southwest Washington in Clark County. The watershed makes up an area of 67 square miles that extends from Hockinson in the north down to the City of Camas in the south with Vancouver bordering the western edge. Lacamas Creek flows 18 miles from forested headwaters through rural, agricultural, and residential areas before entering Lacamas and Round Lakes, and also feeds Fallen Leaf Lake. Below the lakes, the creek flows to the Washougal River. There is also a fish passage barrier located at a dam below Lacamas Lake. Along with Lacamas Creek, the watershed has five major tributaries. China Ditch, Fifth Plain, and Shanghai Creek are located in the northwest section of the watershed, and, Matney Creek and Dwyer Creek are located in the lower watershed.

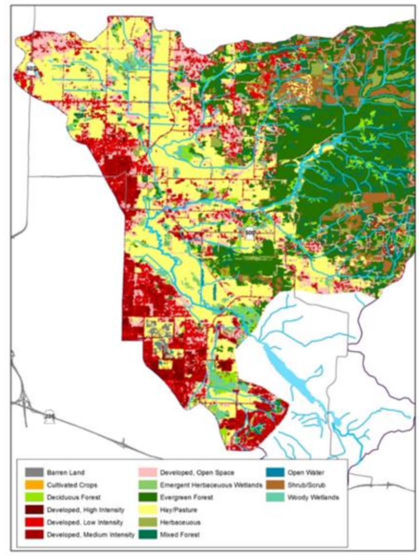
There are also many smaller creeks and channelized streams that flow to Lacamas Creek. These channels were built in the late 1800s to drain the wetlands to create areas for farms and to increase the volume of water to Camas paper mills. The largest of the man-made drainages include China Ditch, Spring Branch, and Big Ditch which all drain to Lacamas Creek. Because of this development and channelization, wetlands make up only 4% of the watershed. With fewer wetland areas to store runoff from rainstorms, higher volumes of stormwater funnel more quickly into streams, eroding stream banks and causing increased flooding in low-lying lands.

Lacamas Creek Watershed

Land Cover

- 35% forestland
- 25% pasturelands and ag lands
- 16% development

Only 22% of the watershed is publically owned



Currently, dominate land cover is forest, followed by pasturelands and agricultural lands, and then developed areas. There is definitely increasing development of high-density residential and commercial areas concentrated in the southern and western watershed near the Cities of Camas and Vancouver.

Only 22% of the watershed is public property. This means that implementation efforts for cleaning up the watershed will rely heavily on private landowners and encouraging voluntary action to use best management practices (BMPs) in order for there to be long-term water quality improvement.

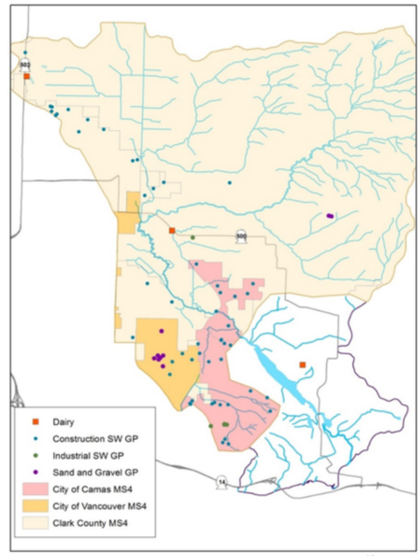
Lacamas Creek Watershed

Permits

- 71 Construction Stormwater General Permit
- 26 Industrial Stormwater General Permit
- 3 Sand and Gravel General Permit

Dairies-WSDA Dairy Nutrient Management Act

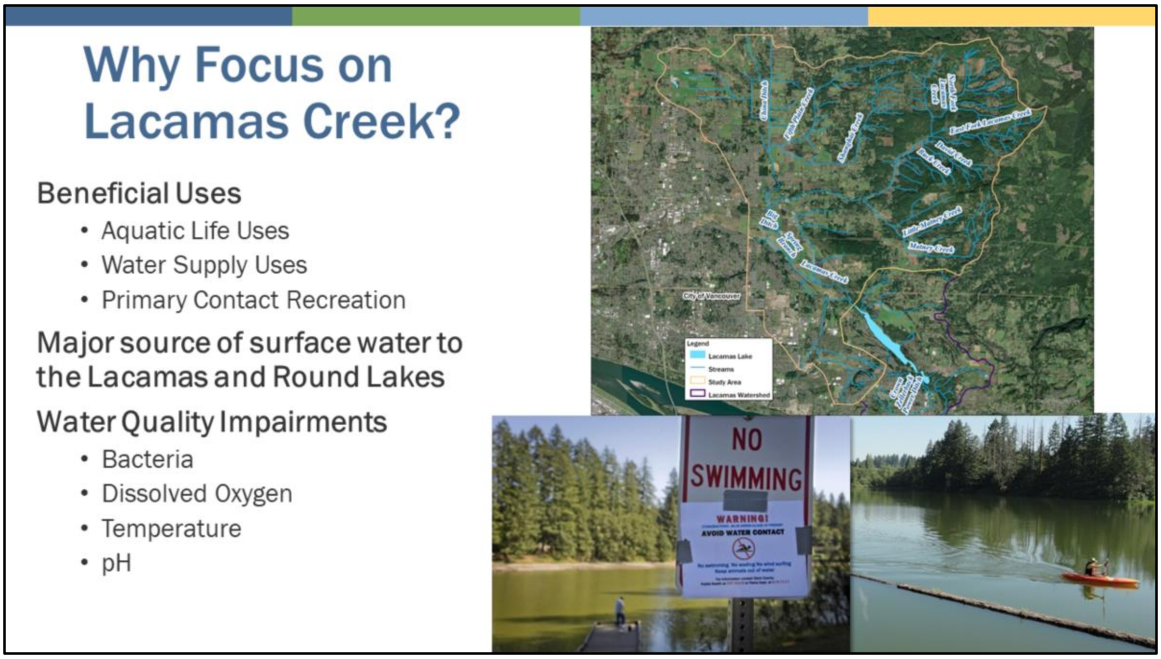
- Laglers Dairy – Large (551 to 900 acres)
- Anderson Dairy - Large (551-900 acres)
- Johnston Dairy LLC – Medium (121 to 300 acres)
  - *Decomissioned*



In terms of permits, the majority are construction stormwater general permits, which is clear indication of development and recent urbanization in the watershed.

There are currently two regulated dairies in the watershed, if you can see on the map the orange square represents dairies with Laglers in the northwest, Anderson in the middle of the watershed, and Johnston Dairy close to the east side of Lacamas Lake. These dairies are regulated by Washington Department of Agriculture's (WSDA) Dairy Nutrient Management Act, and they have inspections every 1.5 year to confirm there are no discharges to surrounding waterbodies, manure lagoons are contained. They go through thorough and frequent inspections.

Johnston dairy outside of the study boundary, but this one is no longer a functioning dairy and is not regulated by the WSDA. As a recent development, the owner of this dairy reached out to Ecology about properly decommissioning the manure lagoon to avoid mismanagement after the dairy shuts down and avoid potential discharge to the lake. We directed them to the Clark County Conservation District.



There are many reasons why we are focusing on Lacamas Creek. The creek provides beneficial uses, the creek could provide habitat for fish and supports natural wildlife. The creek is a potential source of water supply for agriculture, livestock and domestic use. Lacamas Creek is also a major input to the downstream Lacamas Lake, which is a popular area for recreation.

For this study, our study area shown by the yellow border ends where Lacamas Creek enters Lacamas Lake. This is a study boundary that was established by our predecessors who originally started this study years ago. Ecology focused on the watershed, since Lacamas Creek is a major input of surface water to those lakes and the water quality of the creek influences the water quality of Lacamas Lake. A Lake Diagnostics study monitored phosphorus levels in the lake and creek, and they determined that the nearly 96% of the phosphorous loading to Lacamas Lake originates from the Lacamas Creek and nonpoint pollution sources to that creek (Beak Consultants Incorporated and Scientific Resources Incorporated, 1985).

Also, the City of Camas has established an advisory committee focused on water clean-up efforts in the lake, and they are developing a lake management plan to monitor and assess lake water quality conditions and identify strategies to reduce harmful algal blooms. Camas plans to hire a consultant to complete the Lake Management Plan in summer of 2021 and start monitoring in the following years. This plan complements our work; Ecology will focus on targeting watershed sources of pollution from Lacamas Creek while the City and local stakeholders will focus efforts in the Lacamas Lake area. We hope this coordinated effort is an effective strategy to address pollution issues from multiple sources that are affecting both the watershed and the lakes.

Lacamas Creek and its tributaries currently do not meet Washington State's water quality standards for multiple parameters. bacteria, dissolved oxygen, pH and temperature. The impairment of multiple water quality parameters emphasizes the importance for prioritizing Lacamas Creek for water quality improvement.

Washington State Water Quality Standards

Parameter	Criteria
Bacteria	***To protect recreational use:*** *E. coli* and fecal coliform levels must not exceed a geometric mean (a type of average) over 100 cfu/100 mL. No more than 10 % of samples should exceed 320 cfu/100 mL for *E. coli* and 200 cfu/100 mL for fecal coliform.
Temperature	**To protect core summer salmonid habitat:** The 7-day average of the daily maximum temperature must not exceed 12 °C.
Dissolved Oxygen	**To protect core summer salmonid habitat:** Dissolved oxygen must not fall below the 9.5 mg/L.
pH	**To protect core summer salmonid habitat:** pH must be within a range of 6.5 to 8.5 pH units.

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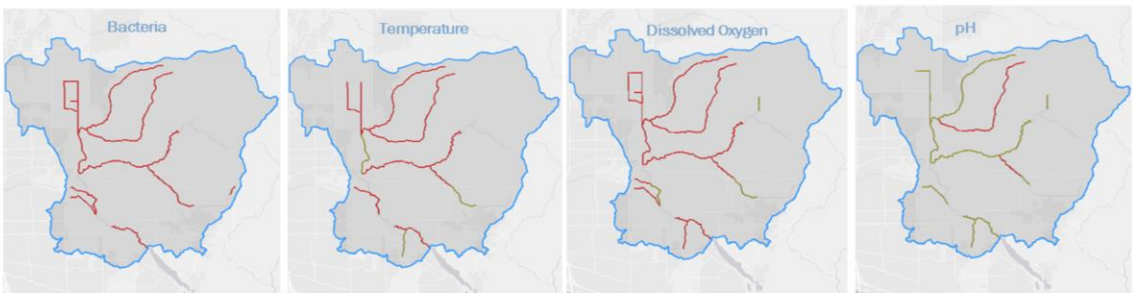
The creek provides beneficial uses, which includes in this watershed recreational use and aquatic life uses and the state establishes water quality criteria to protect those uses. These numeric criteria were designed to protect people who recreate in the waters (which includes swimming and boating) and to also protect aquatic life and important aquatic life cycles.

Ecology uses this criteria to evaluate our results and determine if the waterbody is meeting these standards.

Draft 2018 303(d) Listings



Bacteria
- Lacamas Creek
- Fifth Plain Creek
- Shanghai Creek
- Matney Creek
- Dwyer Creek
- China Ditch
- Big Ditch
- Spring Ditch

Temperature
- Lacamas Creek
- Fifth Plain Creek
- Shanghai Creek
- Matney Creek
- Dwyer Creek
- China Ditch
- Big Ditch

Dissolved Oxygen
- Lacamas Creek
- Fifth Plain Creek
- Shanghai Creek
- Matney Creek
- Dwyer Creek
- China Ditch
- Big Ditch
- Spring Ditch

pH
- Shanghai Creek
- Matney Creek

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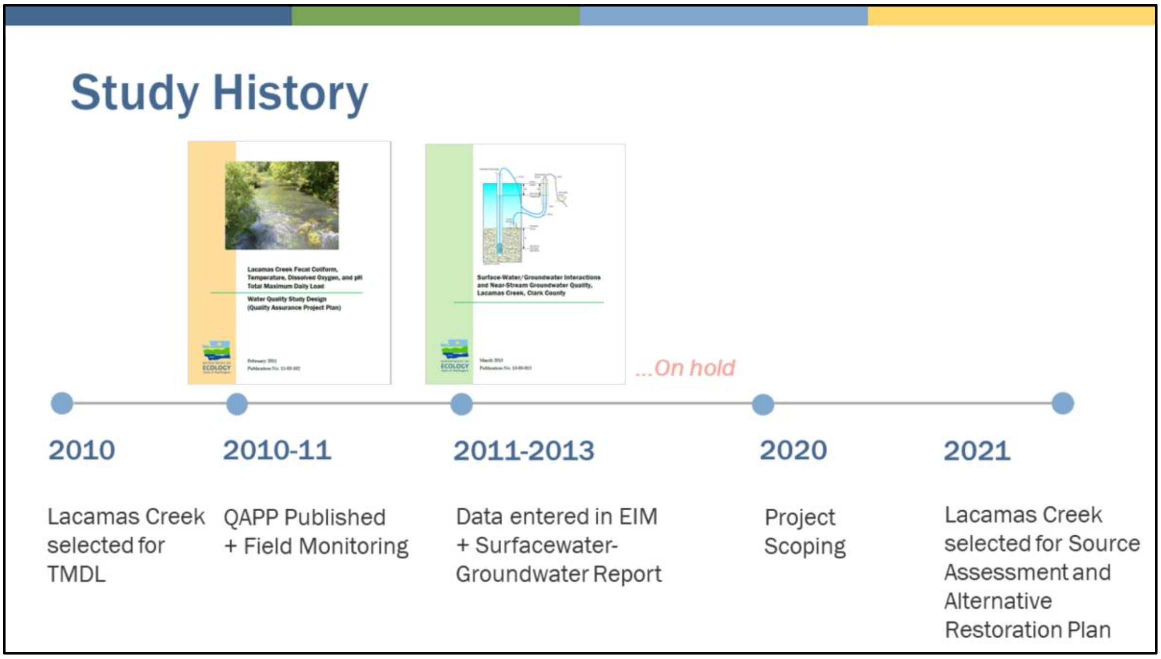
Ecology just released a draft 2018 water quality assessment and a draft 303(d) list, which a list of waterbodies that are considered impaired or do not meet water quality standards. This assessment involved reviewing **recent** data from 2006-2017 which includes the data initially collected for Ecology's Lacamas Creek study. This new review resulted in the listing of new tributaries and stream segments that were not previously listed at the start of this study. The assessment shows the need to evaluate these parameters and further assess the conditions across this watershed.



Here we have a timeline of the progress of the TMDL. Field work was finished by 2011. The groundwater assessment was completed to determine how groundwater influences stream flows and water quality in Lacamas Creek, and a report was published in 2013 summarizing those findings. Yet, a complete assessment of the surface water quality conditions was not completed due to schedule limitations and staff turnover.

It was selected as a worthwhile project to scope out considering that so many resources devoted to this study and the amount of valuable water quality data. Sheelagh McCarthy did an initial scoping of data and a preliminary review of the bacteria data. Just earlier this year, we proposed it to our management team, and we received approval to move forward with the source assessment and **water quality alternative restoration plan**, also known as a **Water Clean-Up Plan.**

Lacamas Creek TMDL

Objective:

- Identify pollution problems.
- Determine how much pollution needs to be reduced to achieve clean water.

2010-11 Monitoring:

Survey type and frequency	Dec (2010)	Jan (2011)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FC bacteria sampling	2	2	2	2	2	2	2	2	2	2	2	2
Piezometer water level measurements and thermistor downloads	1*	1*	1*	1*	1*	1	1	1	1	1	1	1*
Air and surface water thermistor downloads						1	1	1	1	1	1	
Stormwater'					1	1	1	1	1	1	1	1
Dissolved oxygen, pH, and nutrient synoptic surface water and groundwater sampling^								1		1		
Time-of-travel (dye) study								1		1		
Habitat and channel geometry								1	1			
Periphyton sampling										1		

* If possible. Water levels may be too high to access some piezometers.
' Weather permitting. The goal is to sample one summer storm for nutrients and FC and three fall through spring storms for FC.
^ Includes Hydrolab and benthic flux chamber deployment

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Due to the historical water quality impairments, Lacamas Creek Watershed was considered a high priority watershed and was selected for a TDML or total maximum daily load study in 2010. This basics of a TMDL study is to identify pollution problems in the watershed and then calculate the amount of pollutant needed to be reduced to achieve clean water and bring the waterbody into compliance.

This involved an intensive monitoring plan:

- Sampling was conducted at 30 fixed sites and 9 investigative sites for FC bacteria.
- dissolved oxygen, pH and nutrients were also collected for well surveys of surfacewater and groundwater to determine how groundwater influences water quality.
- Continuous temperature.
- Riparian habitat data and channel measurements.
- Flow monitoring.
- Storm sampling during a single dry season storm and at least 3 wet season storms to see the impact of stormwater runoff on water quality.

In summary, Ecology has done an extensive data collection effort already in this watershed.

Source Assessment Study Goals

1. **Complete** the assessment of data collected in **2010-11.**

2. **Collect** additional bacteria data in 2021.

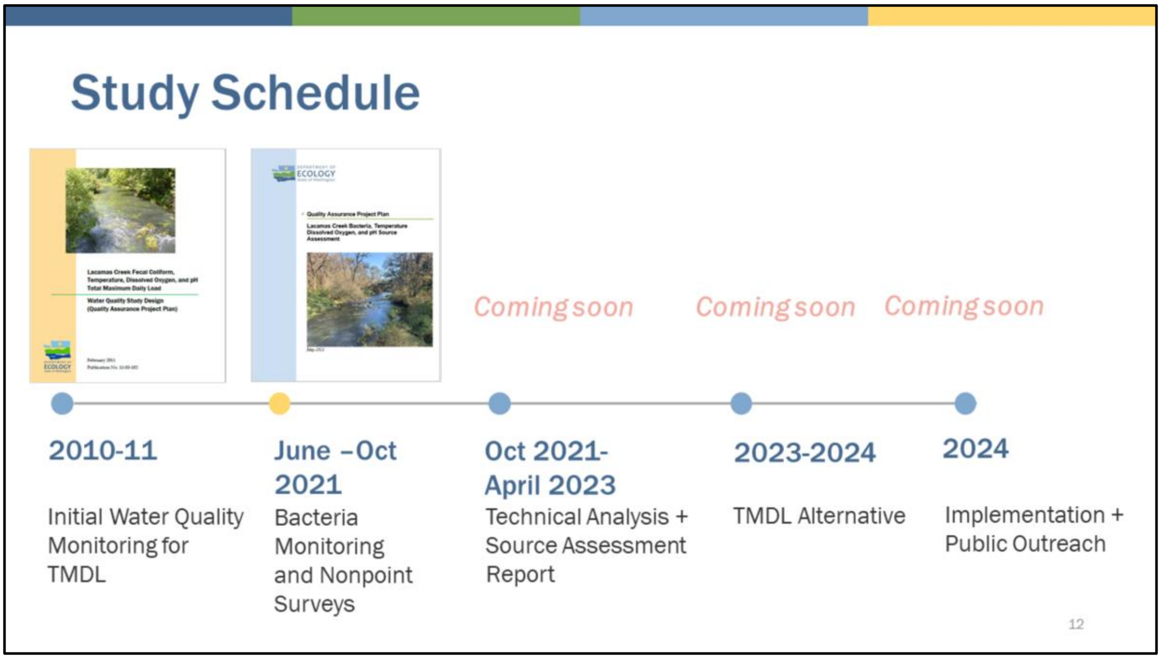
3. Develop a ***Source Assessment*** for Lacamas Creek.

4. **Identify priority areas** for water quality improvement.

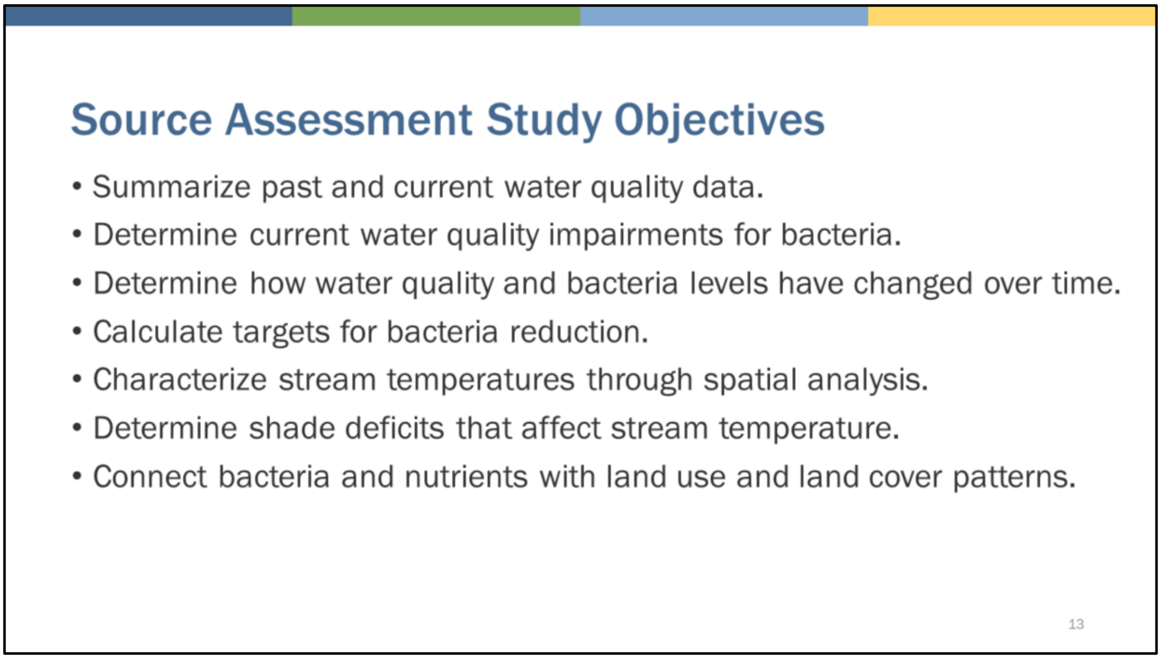
5. Support development of ***TMDL Alternative Restoration Plan*** for Lacamas Creek.

A source assessment is a comprehensive evaluation of the sources that are primarily from nonpoint pollution. A source assessment study can serve as a standalone report or provide the foundation for a future water quality cleanup plan.

The specific goals of this source assessment are to complete the evaluation of the 2010-2011 water quality data. We also will collect additional bacteria data this summer to find current sources of pollution and evaluate changes since the initial data collection. The technical analysis of both datasets will be used to develop a source assessment report, which will identify priority areas for water quality improvement. This source assessment will serve as the technical foundation for the Lacamas Creek TMDL alternative restoration plan.



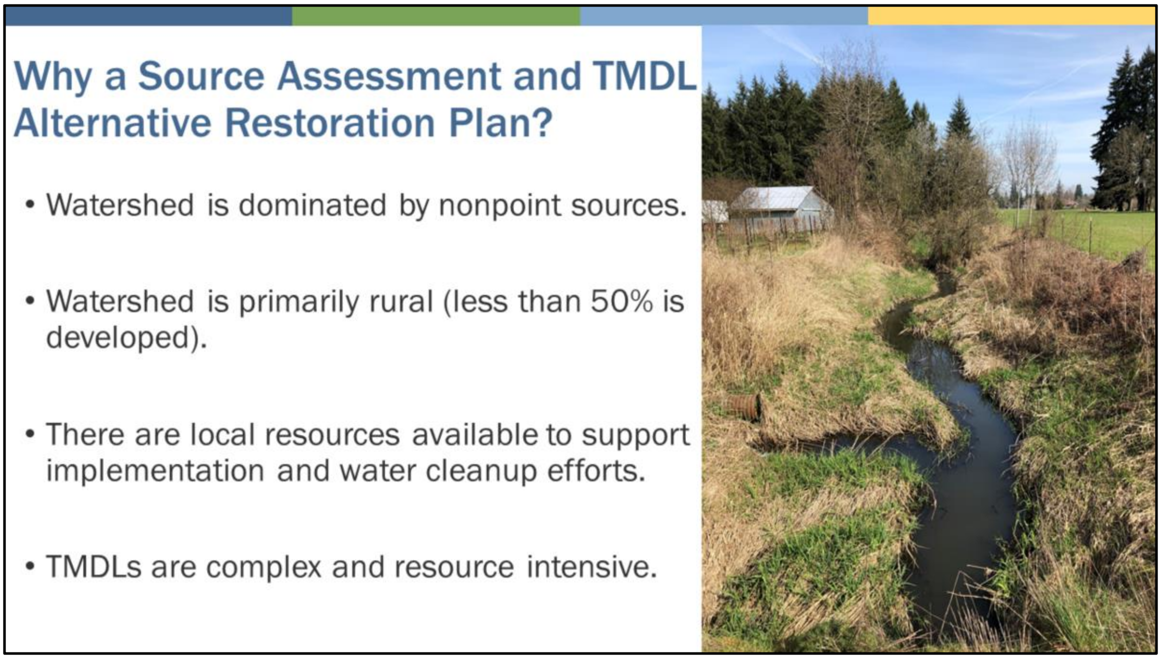
We are almost at the point of starting the additional supplementary bacteria monitoring this summer 2021. Sheelagh and I will complete the technical analysis and Source Assessment report by 2023. Then Devan will step in TMDL Alternative restoration plan. Which will help guide and provide recommendations for future Implementation and outreach.



These are the specific study objectives we hope to achieve from our technical analysis.

- We want to summarize the past and current water quality data.
- With the new data collected this summer, determine current bacteria impairments with updated *E.coli*.
- Compare past to the current data to determine changes over time.
- Determine FC concentration targets should be set to reach water quality standards for each site.
- Characterize stream temperatures through spatial analysis using GIS to show areas with temperature impairments
- Develop shade analysis to determine areas with shade deficits that affect stream temperature
- The evaluation of bacteria and nutrient data will also involve a land use summary to connect the data to land use and land cover patterns on a tributary and subwatershed level. This will help us piece together potential pollution sources.

We hope to complete this multi-parameter assessment and package all of this as a deliverable in our final Source Assessment report.



This study started as a TMDL and we are completing this study as a source assessment and Alternative restoration plan. We are going to achieve the similar objectives: identify pollution problems and calculate the amount of bacteria that needs to be reduced in an area.

The main difference between a TMDL and alternative restoration plan is that Alternatives restoration plans are suitable for addressing nonpoint sources of pollution especially in a more rural landscape. Official TMDLs work well to address urban watersheds dominated by point sources, primarily industrial dischargers and WWTPs. However, TMDLs struggle to adequately address nonpoint sources, since they function by point source regulations. Due to the rural landscape and the limited industrial discharges, the water quality challenges in the watershed are likely associated with nonpoint pollution.

Another crucial component of addressing nonpoint pollution is that there are be local resources available to support implementation and water cleanup efforts. There are several local partners already have established programs to address these nonpoint issues. For example, Clark County Pollution Identification and Correction program, Poop Smart Clark, provides technical and financial support to encourage best practices and voluntary compliance to fix problems related to agriculture and septic systems.

TMDLs have proven to be complex and resource intensive and a lot of time is needed for the approval processes. By adopting a source assessment design, this study can start implementation and water cleanup efforts much sooner.

Nonpoint Pollution Sources

- Dog parks
- Wildlife
- Golf courses
- Livestock
- Manure piles and application in fields
- Animal boarding facilities
- Septic tanks
- Stormwater runoff

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In preparation for this study, we've done initial surveys throughout the watershed and noted relevant nonpoint observations. It's clear from initial surveys this watershed has potential nonpoint sources to consider, and we hope to track the impact with our bacteria sampling.

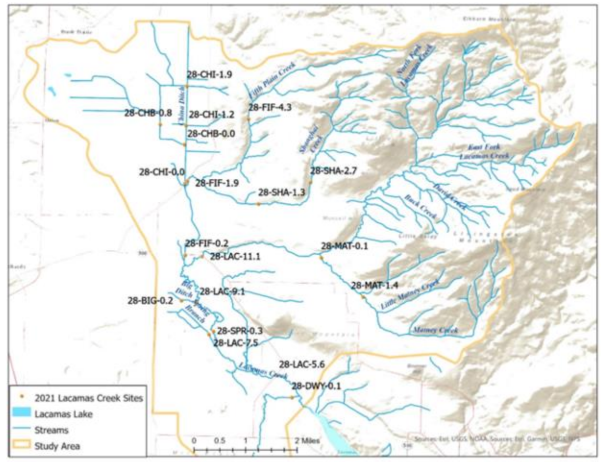
2021 Source Assessment Bacteria Monitoring

Network of 19 Fixed Sampling Sites

- Sampling June-October, ***twice a month***.
- Sampling ***fecal coliform*** and ***E. coli.***
- Focused in areas with historically high bacteria levels.

Investigative Sampling Sites

- Added based on bacteria results.



For the planned field work for this summer, Ecology will collect *E. coli* and fecal coliform at a fixed-network of 19 sites, twice a month from June to October. These are sites that were previously monitored by Ecology. Opportunistic sampling at investigative sites will happen on a need-to basis in order to explore potential areas of concern and sources of pollution.

2021 Monitoring

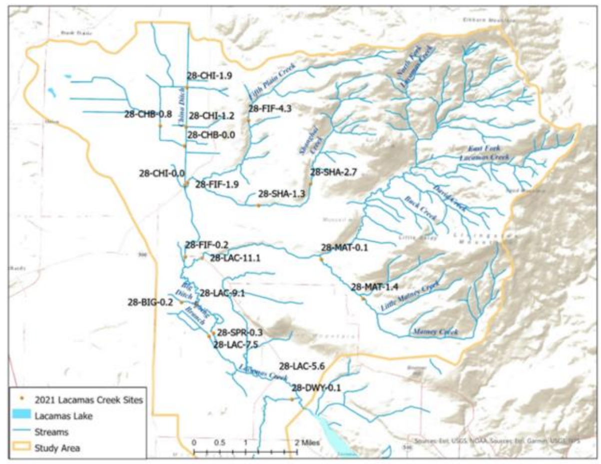
- Ecology's Ambient Monitoring Program:

  WQ Station 28I120 - LACAMAS CREEK AT GOODWIN ROAD

  Sampling October 2020 - September 2021, **once a month** for:
  - E. coli and Fecal coliform
  - Nutrients

    Nitrate+nitrite, Ammonium, Total nitrogen, Total phosphorus, orthophosphate
  - Suspended solids, Turbidity
  - Metals
  - Dissolved Oxygen, pH, Conductivity, Temperature

- Clark County LISP Monitoring
  - Matney Creek- most downstream site
  - Sampling once a month



In addition to our planned field work, Ecology's Ambient Monitoring Program lead by the Freshwater Monitoring Unit has been collecting samples and measurements at a site located right before Lacamas Creek enters Lacamas Lake. The data collected at this site will be complementary to this source assessment by providing current water quality data at a downstream location and providing valuable nutrient data from a site right above the lake. We will be including this data in our source assessment to determine current water quality conditions at this site.

Clark County has collected monthly FC and water quality data at a long-term Matney Creek site since 2001 as part of a long term index monitoring program which is an effort to track water quality trends in important watersheds across Clark County. They will continue to collect monthly samples at Matney Creek this summer.

There is already foundational data from Ecology and Clark County that will serve as a guide for this planned monitoring and helped us prioritize where we should sample.

Preliminary Results

- Dry season bacteria exceedances at a majority of sites
- High fecal coliform levels at:
  - China Ditch
  - Shanghai Creek
  - Fifth Plain Creek
  - Big Ditch

  Results supported by Clark County fecal coliform monitoring

Preliminary results:

https://storymaps.arcgis.com/stories/9da4d4afbb06449d85c67b932776911a/edit

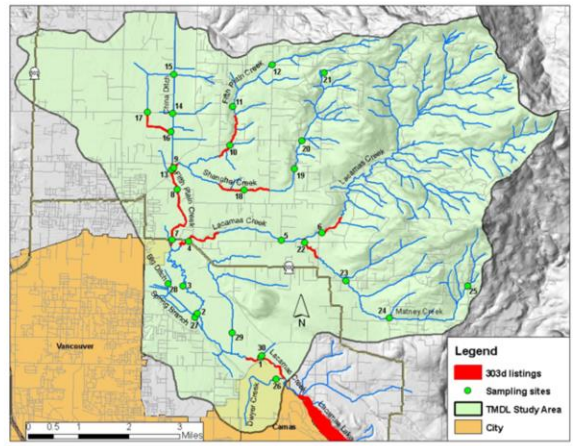
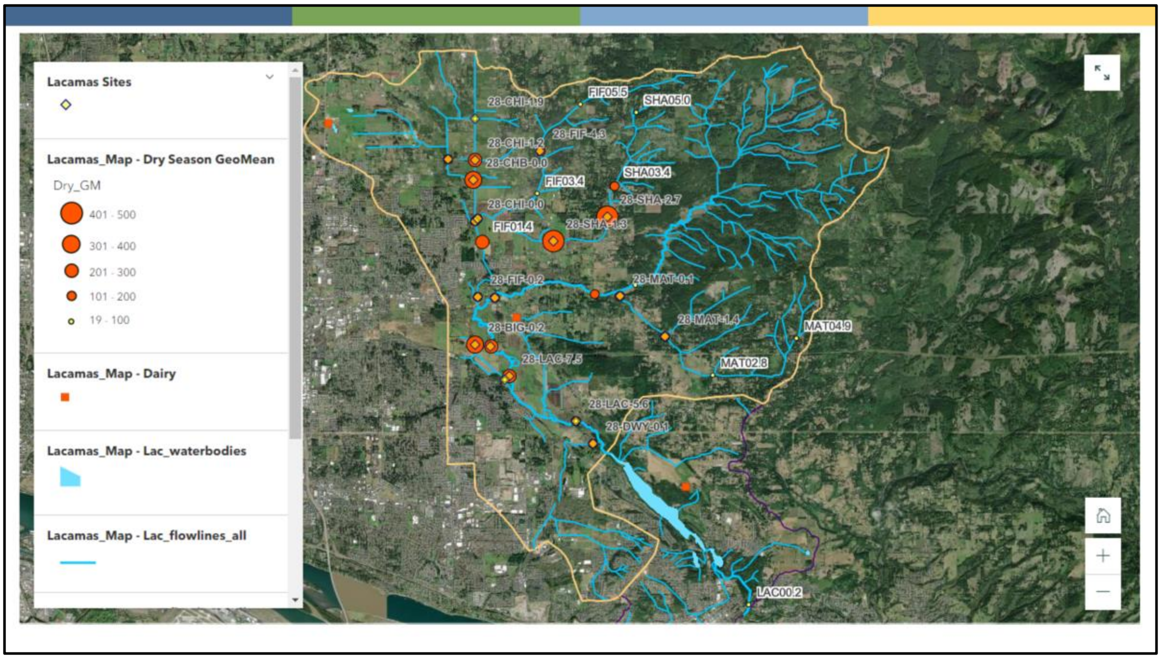


Figure 3. Fixed-network sampling locations in the Lacamas Creek watershed.

To prepare for this study, Sheelagh McCarthy has already done the initial scoping and review of Ecology's bacteria data. She found that most of the exceedances happened during the dry season over the summer. This is why we are focusing on summer monitoring since it was shown to be a critical season. And she was able to find the high priority areas that had the highest exceedances.

Clark County has provided more recent fecal coliform data that confirms there still are high levels of bacteria in these areas of concern.



**Story map will be published once approved; for now here is a snapshot of the map.*

The golden diamonds represent where we will be sampling this summer.
The bacteria data from 2011 is represented as a circle which represent dry season Geometric mean: this is an average of fecal coliform from June to October of 2011.
Study area outlined in yellow ends right at the confluence with the lake.

China Ditch

China Ditch is located in the northwest corner of the watershed located in Hockinson and Bush Prairie. It was one of the areas that was heavily channelized. Some of the study's highest bacteria levels were detected here. The highest geomean calculated for a core site **in this area** was at the most downstream location of a tributary that flows to the main China Ditch Channel. Upstream of this tributary is Hockinson Meadows Park, an open leash dog park with evidence of wildlife. Further upstream in between the channelized tributaries is the golf course, hobby farms, and Lagler's dairy. Investigate samples will be collected along these areas; they were not chosen as core sites due to low flow conditions already this April.

Fifth Plain Creek and Shanghai Creek

Both China Ditch and Shanghai Creek flow to Fifth Plain Creek which flows to Lacamas Creek. We are sampling upstream and downstream of the confluences of both to see their potential influences.

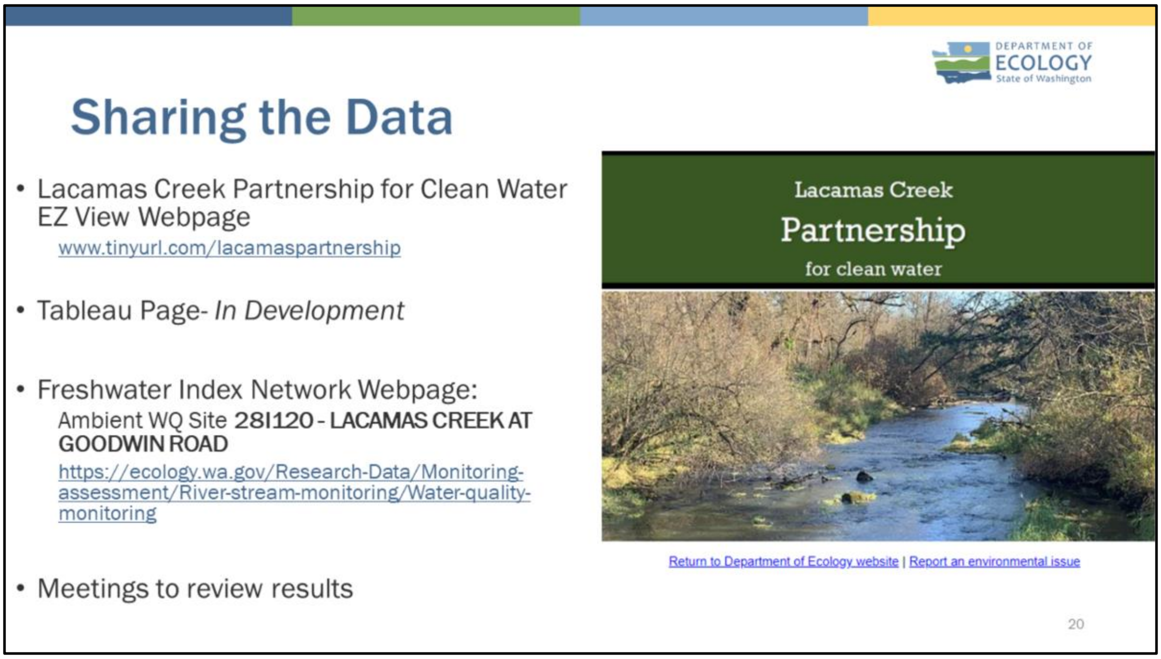
Shanghai Creek is another high priority stream, since the highest geomeans out of all core sites were found at the two downstream sites. The landscape of this area is more forested with private properties right up to the bank.

Lacamas Creek, Big Ditch, Spring Branch
Lower in the watershed, Fifth Plain enters the mainstem of Lacamas Creek as do smaller channelized streams, such as Big Ditch and Spring Branch. We're interested in seeing the bacteria influences of these ditches, since the highest bacteria levels in Lacamas Creek were located at these two sites below Big Ditch. Big Ditch had the next highest geomean in the watershed following Shanghai Creek. In this area, we have a dairy upstream of Spring Ditch and Andersen Dairy is just east of these sites.

Matney Creek
One of the eastern tributaries to Lacamas Creek that we're including in our monitoring is Matney Creek. In 2011, there weren't as high fecal levels compared to the surrounding tributaries, but both of the downstream sites exceeded criteria for the dry season. More recent data has shown higher levels of bacteria. Clark County has collected monthly FC data at a long-term Matney Creek site. Their data has shown exceedances in the annual geometric mean over the past 3 water years. We hope to further explore that creek by sampling upstream of a tributary to find potential sources of bacteria.

Lacamas Creek and Dwyer Creek
We will be sampling at the most downstream location of Lacamas Creek twice a month, which had lower bacteria than the upstream sites. This could be due to dilution from additional inputs of surface water.
In addition to our sampling efforts, the Ambient Monitoring Program will be collecting monthly bacteria, nutrients and metal samples including in-situ measurements of conventional water quality parameters.

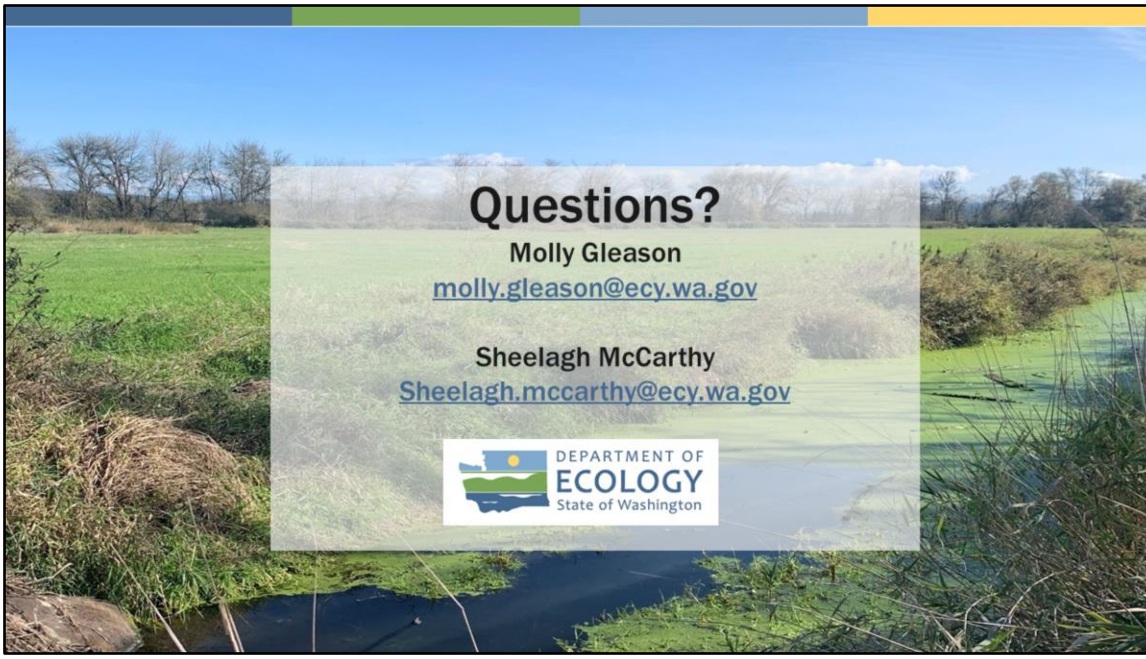
We are also collecting bacteria at Dwyer Creek which is another input of surface water to Lacamas Lake. There weren't as many high bacteria levels at this site, but it's would be comprehensive to include all major inputs Lacamas Lake. Dwyer Creek runs through the Camas Meadows Golf course. And on the other side of the lake, Johnston Dairy is no longer licensed, and a well-managed decommissioning of it's manure lagoon could prevent a direct discharge to Lacamas Lake.



A Lacamas Creek Partnership page was created to be a repository for all information related to this project. We have posted the relevant publications such as the older TMDL QAPP, the groundwater study, and I expect the QAPP for this source assessment to up there by early June. Devan has also created a great FAQ sheet which provides quick overview of our study plan which can be used for outreach.

A link to that tableau page will be posted on that partnership page that will be in development once we start gathering data. The monthly data collected by Ecology's Ambient Monitoring at their Freshwater Index Network Webpage. Results are typically updated 2-3 months after sampling.

My hope is to continue small scale workgroup meetings with Lacamas partners to review the results and maybe even start early implementation efforts if we we're seeing some obvious signs of bacteria pollution. This meeting will also be useful to keep in touch on how the lake management plan is developing and other going-ons in the watershed. So we are developing a communication plan to determine the logistics and frequency of that meeting and will be in touch at least by June with more information about how those workgroup meetings are going to proceed.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DEPARTMENT OF
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State of Washington

TMDL

- A total maximum daily load is a CWA-defined allocation of pollutant loads that will meet water quality standards.
- TMDLs establish the loading capacity of a waterbody and set wasteload allocations for point sources and load allocations for nonpoint sources.
- TMDLs work well to address urban watersheds dominated by point sources, primarily industrial dischargers and WWTPs.

Water Quality Alternative Restoration Plan

- An Alternative Restoration Plan is focused on implementing corrective actions directly, rather than relying on modelling or the assignment of load allocations and wasteload allocations.
- When waters are clean enough to meet water quality standards, they are delisted.
- Alternative Restoration Plans work well to address rural watersheds dominated by nonpointpoint sources.

2021 Sampling Sites

Site	Waterbody	Latitude	Longitude	Description
28-FIF-0.2	Fifth Plain Creek	45.67198	-122.49457	5th Plain Ck at 4th Plain Rd NE (SR 500). Most downstream Fifth Creek location.
28-CHI-0.0	China Ditch	45.69203	-122.49551	China Ditch at NE Ward Rd and 172nd Ave intersection.
28-FIF-1.9	Fifth Plain Creek	45.6928	-122.49449	5th Plain Ck at NE Ward Rd and 172nd Ave intersection.
28-CHB-0.0	China Ditch	45.70299	-122.49603	China Ditch tributary at Hokinson Meadows Park.
28-CHI-1.2	China Ditch	45.70839	-122.4956	China Ditch at intersection of NE 172nd Ave and NE 119th St.
28-CHB-0.8	China Ditch	45.70848	-122.50595	China Ditch tributary at NE corner of Hokinson Meadows Park.
28-CHI-1.9	China Ditch	45.71945	-122.49564	China Ditch north of 131st St on NE 172nd Ave.
28-FIF-4.3	Fifth Plain Creek	45.71064	-122.47061	5th Plain Ck at Sliderberg Rd and 122nd Circle.
28-SHA-1.3	Shanghai Creek	45.68683	-122.46579	Shanghai Ck at NE 202nd Ave.
28-SHA-2.7	Shanghai Creek	45.69327	-122.4452	Shanghai Ck at NE 222nd Ave.
28-DWY-0.1	Dwyer Creek	45.63267	-122.45051	Dwyer Ck at golf course maintenance shop.
28-LAC-5.6	Lacamas Creek	45.63878	-122.45697	Lacamas Ck at Goodwin Rd.
28-LAC-7.5	Lacamas Creek	45.65071	-122.4825	Lacamas Ck upstream of Spring Branch off 182nd and 38th.
28-SPR-0.3	Spring Ditch	45.64985	-122.48429	Spring Branch Ck near 182nd Ave and 38th Way.
28-BIG-0.2	Big Ditch	45.65913	-122.49566	Big Ditch near Lacamas Ck.
28-LAC-9.1	Lacamas Creek	45.65872	-122.4895	Lacamas Ck near Big Ditch.
28-LAC-11.1	Lacamas Creek	45.6717	-122.48783	Lacamas Ck at 4th Plain Rd NE (SR 500).
28-MAT-0.1	Matney Creek	45.67218	-122.4401	Matney Ck at NE 68th St.
28-MAT-1.4	Matney Creek	45.66142	-122.42297	Matney Ck at NE 53rd St.

The table represents the Ecology's site list for bacteria sampling in 2021. *The final list will be confirmed in the final Lacamas Creek Source Assessment QAPP.*

Preliminary analysis of 2010-11 fecal coliform data

DEPARTMENT OF ECOLOGY State of Washington

Site	Waterbody	Annual Geometric Mean	Annual % Exceed	Wet Geometric Mean	Wet % Exceed	Dry Geometric Mean	Dry % Exceed
LAC00.2	Lacamas Creek	18	5%	18	8%	19	0%
LAC05.6	Lacamas Creek	74	16%	50	14%	123	18%
LAC07.5	Lacamas Creek	99	28%	53	14%	221	45%
LAC09.1	Lacamas Creek	82	32%	37	14%	227	55%
LAC11.1	Lacamas Creek	55	16%	32	14%	108	18%
LAC13.3	Lacamas Creek	29	8%	11	0%	104	18%
LAC14.8	Lacamas Creek	19	8%	6	0%	74	18%
BIG02.0	Ditch	109	40%	47	14%	315	73%
DWY00.1	Dwyer Creek	45	10%	27	0%	126	29%
GOL00.0	Unnamed Tributary	5	0%	3	0%	68	0%
MAT00.1	Matney Creek	54	7%	28	0%	150	18%
MAT01.4	Matney Creek	53	20%	22	0%	162	45%
MAT02.8	Matney Creek	25	8%	9	0%	96	18%
MAT04.9	Matney Creek	28	8%	12	0%	87	18%
SPR00.3	Spring Branch Creek	62	8%	44	7%	97	9%
CHB00.0	China Ditch Tributary	71	20%	19	0%	379	45%
CHB00.8	China Ditch Tributary	29	12%	9	0%	124	27%
CHI00.0	China Ditch	55	16%	30	7%	120	27%
CHI01.2	China Ditch	87	28%	41	0%	229	64%
CHI01.9	China Ditch	36	12%	18	0%	86	27%
FIF00.2	Fifth Plain Creek	56	13%	33	4%	115	26%
FIF01.4	Fifth Plain Creek	83	24%	36	7%	238	45%
FIF01.9	Fifth Plain Creek	72	18%	39	0%	186	45%
FIF03.4	Fifth Plain Creek	41	8%	21	0%	97	18%
FIF04.3	Fifth Plain Creek	41	20%	15	0%	153	45%
FIF05.5	Fifth Plain Creek	15	4%	5	0%	58	9%
SHA01.3	Shanghai Creek	156	44%	74	21%	402	73%
SHA02.7	Shanghai Creek	157	44%	69	14%	453	82%
SHA03.4	Shanghai Creek	53	24%	23	7%	151	45%
SHA05.0	Shanghai Creek	16	5%	10	0%	39	14%

This table represents the preliminary fecal coliform data analysis and comparison to the water quality criteria for Primary Contact Recreation. The numeric criteria were calculated for the year, for the wet season (November- May) and dry season (June-October). The Primary Contact Recreation criteria are as follows:

1) Geometric Mean should not be above 100 cfu/100mL.

2) No more than 10% of samples, or any single sample when less than ten, should exceed 200 cfu/100 ml.

Exceedance of the criteria is represented in red. A final statistical analysis of these FC results will be a part of this source assessment.

Environmental Report Tracking System (ERTS)

RCW 90.48.80

It shall be unlawful for any person to throw, drain, or otherwise discharge into any of the waters of this state, or to cause, permit, or suffer to be thrown, run, drained, allowed to seep or otherwise discharged into such waters any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of the department, as provided for in this chapter.

- Two ways to report an environmental problem:
  - Call 360-407-6300
  - Visit http://www.ecy.wa.gov/reportaproblem.html
- Reports can be anonymous or confidential
- May be distributed to other/multiple agencies such as Washington State Department of Fish and Wildlife, Washington Department of Agriculture, and local jurisdictions

The following slides provide examples of issues that can be reported to Ecology.

What's the Problem?

Runoff from agricultural field flowing to ditch that connects to a nearby stream.

What's the Problem?

Muddy runoff from a barn exiting property, which may contain livestock manure.

Before

Limited exclusion fencing to prevent cattle accessing the waterway. Heavy use area at the corner of the property may be releasing contaminated runoff (possibly with cattle manure) to waterway.

After

Exclusion fencing erected to prevent cattle from directly accessing the waterway. Heavy use area at corner of property filled to reduce contaminated runoff.

What's the Problem?

Erosion on stream bank increases sediment in the waterway.

What's the Problem?

Muddy runoff from a construction site entering a stormwater drain.

What's the Problem?

Illicit discharge of toilet paper from a pipe to a stormwater ditch that flows to a nearby creek.