

**Little Bear Creek Basin Planning
Snohomish County Public Works
Technical Workshop**

Wednesday Nov. 2, 2016, 9:30 am – 11:30 am
Brightwater Community Meeting Room
Woodinville, Washington

Attendees:

Last Name	First Name	Organization-Agency
Adman	Eric	Sno-King Watershed Council
Bain	David	Sno-King Watershed Council
Brees	Curt	Cross Valley Water District
Costello	Casey	Washington Department of Fish & Wildlife
Daniels	Logan	Snohomish County Parks & Recreation
Gariepy	Daniel	Washington State Department of Ecology
Johnson	Jennifer	Equine Life Solutions
Kessler	Bruce	King County (Brightwater)
Kubo	Josh	King County
Loch	Andy	City of Bothell
Marshall	Kristin	Snohomish Conservation District
Nelson	Carol	King County (Brightwater)
Sleight	Randy	Snohomish County Planning & Development Services
Smith	Robyn	Equine Life Solutions
Strom	Eric	SnoKing Watershed Council
Shadel	Jonathan	King County (Brightwater)
Strandberg	Terri	Snohomish County Planning & Development Services
Yap	James	Snohomish County Parks & Recreation
Ramm	Sheryl	Equine Life Solutions
Lubliner	Brandy	WA Dept of Ecology
Schmitt	Doug	KC Brightwater
Kyle	David	Trout Unlimited
Schulte	Carrie	ECY

Snohomish County Surface Water Management

Arthur Lee, Snohomish County, Surface Water Management
Bill Lief, Snohomish County, Surface Water Management
David Ojala, Snohomish County, Surface Water Management
Frank Leonetti, Snohomish County, Surface Water Management
Gregg Farris, Snohomish County, Surface Water Management
John Hermann, Snohomish County, Surface Water Management
Karen Kerwin, Snohomish County, Surface Water Management
Keith Hume, Snohomish County, Surface Water Management
Logan Daniels, Snohomish County, Surface Water Management
Mary Hurner, Snohomish County, Surface Water Management
Peggy Campbell, Snohomish County, Surface Water Management

NHC Consulting Team

Patty Dillon, Northwest Hydraulic Consultants (NHC)
Tamie Kellogg, Facilitator, Kellogg Consulting
Aimee Bullock, Meeting Summary, Kellogg Consulting

Meeting Overview

At this meeting, Snohomish County Public Works Surface Water Management Division (SWM) presented Little Bear Creek water quality data summaries in preparation for the development of the Basin Plan, required by the National Pollutant Discharge Elimination System (NPDES) permit.

Welcome, Introductions and Workshop Purpose

Facilitator Tamie Kellogg welcomed everyone and led the introductions. She reviewed the meeting agenda and noted the logistics of the facility.

Context & Project Goals

Project manager, Arthur Lee thanked the Brightwater hosts and introduced the project team. He provided an overview of the project background, planning process and meeting purpose, making the following key points:

- The purpose of today's meeting is to share information that the project team has analyzed, and to discuss modeling and potential strategies that will help restore stream flow and water quality.
- The watershed-scale stormwater plan we are preparing is required by Washington State Department of Ecology (Ecology) in compliance with the County's NPDES Phase 1 permit and is due to Ecology on September 6, 2017

Q&A from this section

Q: When the plan is complete will it be advisory or a requirement?

A: Snohomish County is required by the Department of Ecology to produce the plan. It is not clear what Ecology may require in the future. The County may use portions of the plan to guide actions in the watershed.

Q: Who, internally, makes the final decision on whether or not the plan gets implemented?

A: –The plan recommendations will be considered as part of SWM’s annual work plan, which is planned and prioritized during the annual budget process. To the extent that the plan recommends actions by other divisions, departments or agencies, they will have their own processes for consideration of potential implementation.

Q: What is the planning horizon?

A: The plan is modeled based on a build-out scenario using the 2015 Snohomish County Comprehensive Plan. The Comprehensive Plan has a 20-year horizon, to 2035.

Water Quality Results & Targets

John Hermann, Snohomish County SWM water quality specialist, gave a presentation on water quality results, which included concentrations of dissolved copper and zinc, fecal coliform and temperature study results and made the following key points:

- The Little Bear Creek watershed does not exceed state standards on metals.
- The watershed exceeds state standards on temperature during summer and winter months, within the 10-year timeframe. Modeled future conditions remain the same or decrease.
- The watershed currently exceeds the standard on fecal coliform.

Q&A from this section

Q: Does the model take into account the increased traffic?

A: Yes, we were able to capture the load of the run off from the roads in the model.

Q: Does the model get updated to include the increase in traffic over time?

A: No, the model only addresses changes in land use.

Q: What are the temperatures in the various regions on the map?

A: They are 16.5-17 degrees celcius on average. It varies by region throughout the year.

Q: How did you select your parameters of the sample core pollutants targets?

A: Each of these targets are a state standard and commonly found in stormwater.

Q: How much stream water quality data did you collect?

A: We collected about ten years worth of data sets. We have more monitors running full time in the last three years so we have a large amount of recent information.

Q: What is the plan based on for modeling future conditions?

A: We started with the 2015 Comprehensive Plan existing policies and adopted requirements to project future conditions. The Comprehensive Plan guides the areas of potential redevelopment.

Q: How are the temperature exceedances expressed in the findings?

A: They were calculated on a seven- day running average.

Q: So, every day you get a seven-day average, did you look at that annually or by month when you ran the averages?

A: It was wrapped up and averaged. We use a seven-day average of maximum daily temperatures. This is computed daily for the seven-day window centered around each date.

Exceedances consider the value for each day, so if we have a particularly warm week, we could have seven (or more) exceedances for that one period. There are days in the summer when the value is much higher than the threshold, and days when it is much lower depending on where you are in the basin.

Q: Was the temperature study spread out over times of day?

A: The model produced hourly temperature data, but the seven-day average of maximum temperatures was calculated using the maximum daily temperature from each day. A detailed look at hourly temperatures is not part of this study.

Q: Was the fecal coliform analyzed for major source?

A: No.

Q: Does the model account for climate change?

A: The actions that we're talking about to address temperature are the same actions we would recommend to deal with climate change. The permit does not require us to address climate change. King County is conducting a climate change study that we will review, but it is not included in this planning effort.

Q: Can you provide an example of a type of land use development that will lower water temperature?

A: Low impact development (LID) provides a good example. The current stormwater treatment requirements of LID include flow control, containment and infiltration.

Q: Did you identify areas that are infeasible for infiltration?

A: Yes. Areas with soils that are not suitable for infiltration or with known high groundwater were assumed to have no infiltration in the scenarios that have been modeled, and will not have infiltration BMPs recommended.

Q: Did you include stream shade as a form of temperature mitigation?

A: We did consider it in the plan, but not as an element of development. There is a shade parameter in the model related to stream reaches. This was not assumed to be affected by development, which occurs outside of stream buffer areas, but impacts of increasing shade through buffer restoration will be explored.

Q: Is there any biological rationale for the seven-day average?

A: That range comes from Washington State Administrative Code (WAC) and is based on the fish lifecycle. The code requirements were established by studies. The thresholds for impacts to fish are identified in state code. Twenty-two degrees Celsius or higher can be lethal. We don't see those levels of exceedances in this stream even on our highest days.

Biological Results & Targets

Frank Leonetti, SWM habitat specialist, gave a presentation on B-IBI (Benthic Index of Biotic Integrity) and relationship to flow. He stated that B-IBI standards are not included in the Washington Administrative Code (WACs) and the County has chosen 90% of forested condition as the target for this watershed.

Q&A from this section

Q: Can you explain the metrics of pulse count, high pulse range and flashiness index?

A: A pulse count is based on whether daily average flow is equal to or greater than two times the long term daily mean flow. Flow exceeding two times the annual mean is considered a high pulse event.

High Pulse Range is equal to the number of days “of the water year” (October through September) when the pulse counts occur – days between first occurrence and last occurrence up to maximum of 365 day range.

The Richards-Baker Flashiness Index is a number that is calculated based on the yearly sum of all day-to-day average daily flow changes (absolute values) divided by the yearly sum of all daily flows. The Flashiness Index does not have units. It does describe a pattern of flows increasing or decreasing, in terms of their flashiness. For instance, how quickly the flow increases and decreases. The Department of Ecology asked us to identify three parameters.

Q: Did you consider other channel characteristics that could affect the bugs, other than flow, for instance sediment or large woody debris (LWD)?

A: Yes, this is a challenging analysis to pursue and we are taking those into account.

Q: How did you choose 90% forested as a target?

A: That goal was provided by the Department of Ecology.

Q: For the B-IBI, are there any attributes about the ten metrics that suggest which bugs are more impaired, so that you can attempt to boost scores?

A: We are looking at the individual metrics. There are five factors that drive the increase and five factors that do not fluctuate very much at all.

Among the ten metrics comprising the B-IBI index, we found for seven long term (12 years) sites that five metrics fluctuate more than five others, and it is the fluctuation in these five metrics that account for the interannual changes in BIBI scores by year. The five that fluctuate are Taxa Richness, EPT Richness, Long-lived Richness, Percent Dominant Score, Predator Percent Score. The five least variable metrics are Ephemeroptera richness, Tricoptera richness, Clinger Richness Score, Intolerant Richness Score, and Tolerant Percent Score.

The first five account for 90% of the variability in annual B-IBI scores during the 12 years and seven sites, and may be the metrics that are currently changing relative to observed changes in annual conditions (e.g., flow). This does not mean that the first five metrics are more important or are even higher scoring than the least variable five metrics. The greatest potential improvement would be in the Intolerant Richness Score. This review of score metrics allows for the evaluation of discrete metrics and potential response to annual flow changes to better understand biological response to inter-annual changes in flow.

Stormwater Strategy Analysis:

Patty Dillon, NHC, gave a presentation on how the project team will do the modeling, and what they expect to get out of it. NHC will use input data from the calibrated HSPF model to evaluate landscape-level structural BMPs and non-structural programs/actions. SUSTAIN, an optimization tool, will be used to allow determination of the combinations of strategies that will be cost-effective in meeting water quality treatment goals. The most promising solutions from SUSTAIN will be routed through the stream network in the HSPF model. NHC will be modeling closer to ten scenarios and will present full results of five different scenarios. Non-modeled strategies will also be considered for incorporation in the plan. NHC will include shading and buffer enhancement scenarios into the instream HSPF modeling.

Q&A from this section

Q: How are you considering the “over building” of lots? And who is monitoring that and its effectiveness?

A: Future development assumptions were based on the current comprehensive plan. Policy requirements for new development include surface water mitigation, such as retaining and infiltration.

Q: How will you adaptively manage the population increase in the basin?

A: Modeling represents fixed points in time, “snapshots” of different development levels. Our model was calibrated to land use from 2013, including existing facilities. We also have a pre-development scenario with all forest land cover and a future scenario representing full development (build-out) under the current Comprehensive Plan. Surface Water Management (SWM) does some monitoring and it is used for many different purposes. It could be used to gauge the impact of development over time but we are not currently studying that. We do contribute the data that we collect to a regional effort of monitoring by the Department of Ecology.

Q: How are you going to take in to consideration new data you may collect in the future?

A: Snohomish County collects long term ambient water quality data in Little Bear Creek for the purpose of tracking status and trends. This data has also been used to develop the TMDLs for Little Bear Creek. Future data will continue to be used to track status and trends and monitor exceedances of water quality standards in Little Bear Creek.

Q: How do you quantify the extent of the Best Management Practices (BMPs) in the model?

A: Using GIS screening, we establish a realistic boundary of appropriate space available in each of the treatment areas for each of the BMPs. This represents an upper limit in the SUSTAIN model. The amount determined for each BMP will be less than or equal to that, as determined by the optimization.

Q: How have you determined your participation rate in programs for things like citizen rain gardens?

A: We’ve looked at participation in similar past programs and we looked at the amount of land available for that type of BMP. Then we included those estimates in our modeling scenarios. First, we have to identify how much we need and then we will work out how we’re going to make it happen.

Q: Is the goal or standard you are trying to achieve for modeling 100% forested?

A: No, the goal is to meet the permit standards on metals, fecal coliform and hydrologic conditions consistent with 90% of forested B-IBI, estimated from hydrologic metrics.

Q. Where can we go online to explore the “structural type” strategies that a homeowner can do to help create some of these solutions?

A: A couple of structural type strategies would include the:

- Conservation District, which has funding specifically for agriculture or hobby farm structural solutions
- County’s Savvy Septic program offering loans or grants to assess and maintain septic systems

Plan Development & Next Steps

Arthur Lee thanked everyone who participated in the workshop, and provided the following information on next steps:

- Written Comments: A few comment cards were received at the workshop and County staff have followed up as appropriate to provide information.
- February 14, 2017 - Technical Workshop#2 , 9:00 a.m. at Brightwater.
- Spring 2017 – Public meeting to share the Draft Little Bear Creek Basin plan.
- Technical reports will be available on the project website in 2017 as they are finalized.