

**SALMON CREEK TOTAL MAXIMUM DAILY LOAD:
REPORT ON May 21, 2009 MEETING
(July 15, 2009)**

Participants

Denise Smee, Clark Conservation District
Jeff Schnabel, Clark County Clean Water Program
Tom Gonzales, Clark County Public Health
Jeff Wittler, Clark Public Utilities
Bernadette Graham Hudson, Lower Columbia Fish Recovery Board
Tom Pinit, Kennedy/Jenks
Mark Cullington, Kennedy/Jenks
Elaine Huber, City of Battle Ground Public Works
Thom McConathay, citizen
Ben Dennis, Salmon Creek Watershed Council
Scott Collyard, Department of Ecology
Anita Stohr, Department of Ecology
Rod Schmall, Department of Ecology
Brett Raunig, Department of Ecology
Ryan Paulsen, Department of Ecology
Kim McKee, Department of Ecology
Betsy Dickes, Department of Ecology
Tonnie Cummings, Department of Ecology

Meeting Objectives

- Review results from Department of Ecology's (Ecology) status and trends analysis of water quality data collected in the Salmon Creek watershed between 1988 and 2008.
- Discuss process and timeline of Ecology's pilot project to conduct an innovative and streamlined temperature Total Maximum Daily Load (TMDL) in the Salmon Creek watershed.
- Discuss implementation activities and accomplishments since November 2007 relative to the Salmon Creek fecal coliform and turbidity TMDL Detailed Implementation Plan (DIP).

Background

Salmon Creek flows from the foothills of the Cascade Mountains west to Lake River which in turn flows into the Columbia River. The Cascade foothills are generally forested while the lower drainage is primarily urban. The city of Vancouver lies just south of lower Salmon Creek, and several small towns lie along the tributaries and central plains of the basin (Figure 1). These middle reaches contain a mixture of small towns, large and small-scale farms, pasture, and homes. The basin is highly urbanized near Vancouver, with many small subbasins already heavily developed. These subbasins often experience problems with stormwater runoff, inadequate buffer vegetation, erosion, and sedimentation.

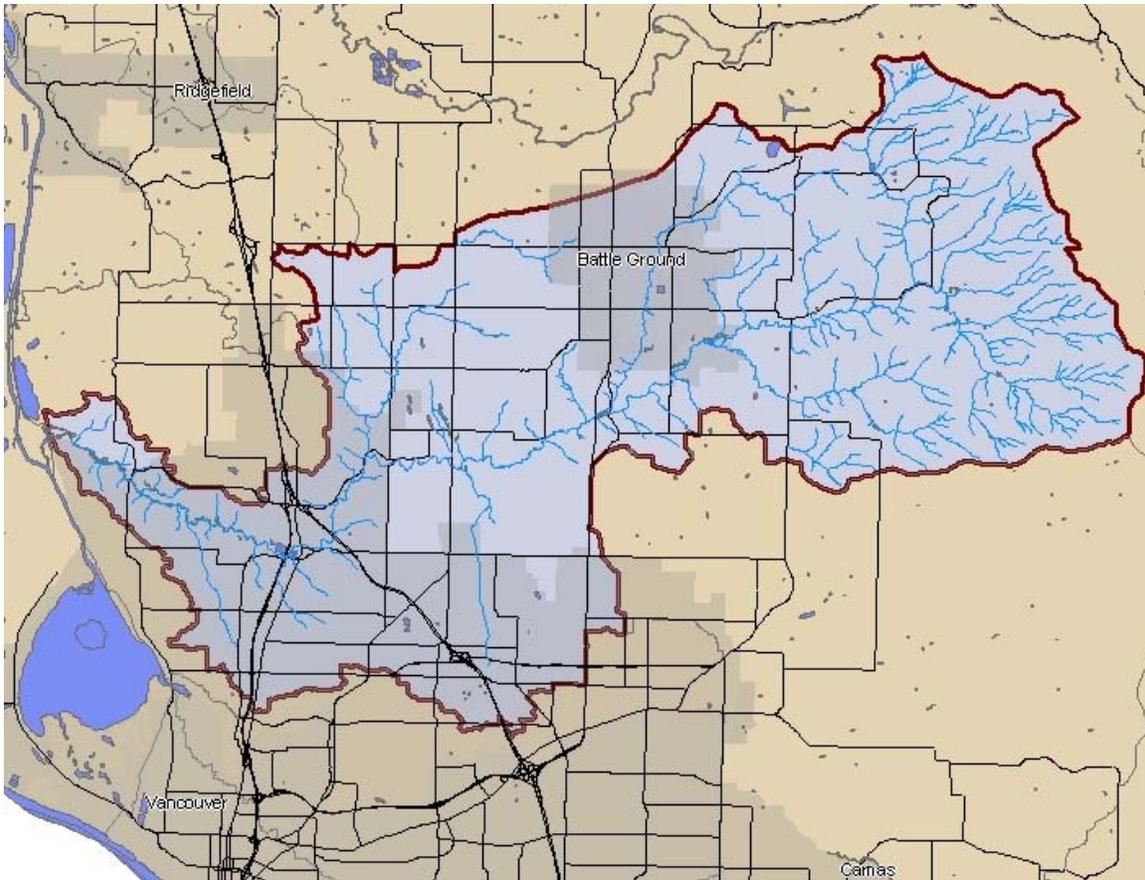


Figure 1. Map of the Salmon Creek watershed (courtesy of Clark County Clean Water Program).

Elevated levels of fecal coliform were measured in the basin as early as the 1980s. Using water quality data collected by local government agencies during 1988 through 1994, Ecology staff conducted modeling to determine the pollution reductions necessary to bring Salmon Creek into compliance with water quality standards for fecal coliform and turbidity. The modeling results were described in a 1995 Ecology report. In a 2001 report, Ecology discussed, in general, the agencies and activities that would contribute to cleanup efforts. More information on responsible agencies and specific activities was provided in Ecology's 2005 DIP for the Salmon Creek watershed. Control measures focus on 1) reducing the amount of animal waste entering the creek, 2) locating and eliminating sources of human fecal coliform contamination, and 3) reducing the amount of sediment entering the creek from stormwater and farming, forestry, and construction activities. Salmon Creek also exceeds water quality standards for temperature, pH and dissolved oxygen; those parameters have not yet been addressed in a cleanup plan.

The first adaptive management meeting for the Salmon Creek fecal coliform and turbidity TMDL was held on November 7, 2007 (see the meeting report at <http://www.ecy.wa.gov/programs/wq/tmdl/SalmonCr/SalmonCr110707MtgRpt.pdf>). Responsible agencies have implemented a number of activities outlined in the DIP including extensive water quality monitoring, stormwater infrastructure improvements, riparian restoration, and education and outreach to small acreage landowners and

homeowners with on-site septic systems. At the November 2007 meeting, stakeholders suggested that Ecology compile and analyze existing data to determine if there have been any changes in water quality in Salmon Creek over the years. The group also agreed to formally request that Ecology consider using the Salmon Creek watershed for a pilot project involving development of an innovative, fast track temperature TMDL. Ecology's Environmental Assessment Program (EAP) agreed to do both projects.

Water Quality Data Analysis Project

Scott Collyard of EAP gave an overview of his analysis of the 20-year water quality dataset compiled for 8 monitoring stations in the Salmon Creek watershed (see <http://www.ecy.wa.gov/programs/wq/tmdl/SalmonCr/SalmonCrDataAnal052009.pdf>).

A final project report detailing the analysis and results will be available in August 2009. Highlights of Scott's presentation are as follows:

- He congratulated advisory committee members for their accomplishments in the watershed including long-term collection of high quality data, completion of a number of implementation activities, and an obvious commitment to work cooperatively to facilitate the cleanup plan.
- Turbidity levels have improved significantly in the watershed to the point that delisting for this water quality parameter is warranted.
- Fecal coliform concentrations have decreased significantly at all monitoring sites; however exceedances still occur at 7 of the 8 sites.
- Fecal coliform concentrations are higher in the dry season (May through September) than the wet season (October through April). A similar situation has been documented in other watersheds in the state. The seasonal difference suggests the source of fecal coliform is chronic in nature and concentrations are diluted by wet season flows.
- A comparison of fecal coliform concentrations with land use/population density in the Salmon Creek area showed subwatersheds with greater human impact, e.g., Cougar Creek, had higher fecal coliform concentrations.
- Both nitrate-nitrogen and total phosphorus data showed significantly decreasing trends at 6 of the 8 monitoring sites. Concentrations in the Salmon Creek watershed were not indicative of substantial anthropogenic influence.
- Dissolved oxygen (DO) and pH exceedances occurred at all monitoring sites. Given that exceedances occurred at the uppermost, relatively unimpacted site, it is possible that Salmon Creek has naturally low DO and pH levels.

Innovative Temperature TMDL

Anita Stohr of EAP gave a presentation on the innovative temperature TMDL project that will begin in fall 2009 (see Anita's PowerPoint presentation at <http://www.ecy.wa.gov/programs/wq/tmdl/SalmonCr/InnovSalmonCrPres052109.pdf>).

Highlights of Anita's presentation are as follows:

- The innovative temperature TMDL will meet all of the U.S. Environmental Protection Agency (EPA) requirements but will use information gained from past projects to streamline production of a report. This process will allow energy and resources to be focused on implementing cleanup actions rather than conducting a study.

- Almost all temperature TMDLs conducted in Washington to date have resulted in load allocation targets that are equal to system potential shade (mature riparian vegetation), and Ecology assumes this would also be the result for Salmon Creek.
- Ecology will use soil survey data, along with aerial photography and LiDAR, to calculate system potential shade.
- A shade curve will then be developed that is based on the estimated relationship between riparian shade, channel width, and stream aspect at the assumed maximum riparian vegetation condition. The shade curve provides the riparian shade targets for restoration efforts.
- Ecology's goal is to have an EPA-approved temperature TMDL and implementation plan by fall 2010.

TMDL Accomplishments from November 2007 through May 2009

Clark Conservation District (District):

- Completed a report and a GIS-based map for its Ecology grant-funded regional livestock inventory (see the report at <http://www.ecy.wa.gov/programs/wq/tmdl/SalmonCr/CCDfinalrptlivestkinventgrant.pdf>). The project provides a general overview of areas in the county with high concentrations of livestock indicating where the District should focus livestock-related outreach efforts.
- Currently developing a handbook entitled "Rural Living in Clark County" that will provide information on practices rural landowners can follow to minimize impacts on water quality and other natural resources.
- Successfully competed for a FY2010 Centennial Fund grant to provide outreach to livestock owners in Clark County on water quality protection.
- In June 2008, the District submitted a proposal to the Clark County Board of Commissioners asking that they approve a special property assessment to provide a stable source of funding for District activities. Unfortunately, the assessment was not approved.

Clark County Clean Water Program:

- Continued implementing its Phase I NPDES Municipal Stormwater Permit and updating its Stormwater Management Plan annually. The stormwater ordinance and manual were adopted in January 2009 and the ordinance went into effect on April 13, 2009 (see <http://www.clark.wa.gov/environment/stormwater/management/code.html>).
- Continued preparing Stormwater Needs Assessment reports which compile summary information relevant to stormwater management, propose stormwater-related projects and activities to improve stream health, and assist with adaptive management of the county's Stormwater Management Program. Reports have been completed for the mainstem of Salmon Creek, Curtin Creek, Mill Creek, and Cougar Creek and are available at <http://www.clark.wa.gov/environment/stormwater/streamhealth/streams.html>. The remainder of the Salmon Creek watershed will be assessed this year.
- Working with a local salmon proponent to locate cold water refugia in the Salmon Creek watershed.

- Developed the Canines for Clean Water Program, an outreach effort that encourages pet owners to clean up and properly dispose of pet waste.
- Unfortunately, budget shortfalls have forced the county to discontinue its Salmon Creek water quality monitoring program as well as support for its countywide volunteer monitoring program.

Clark County Public Health:

- Continued implementing its On-site Septic System Operation and Maintenance (O&M) Program (see <http://www.clark.wa.gov/public-health/septic/index.html>). Program accomplishments include:
 - Inspection of approximately 9,000 septic systems during the first year. O&M specialists (inspectors) found a 33 percent deficiency rate, with about 3 percent of those deemed critical deficiencies. Seventy five percent of the critical deficiencies were corrected within 6 months.
 - Ten homeowners took advantage of a zero percent loan offered by the county to fix failing septic systems.
- Continued finding previously unknown septic systems and adding them to the inspection and maintenance program database.
- Developed an outreach video about septic system inspections. (see <http://www.cityofvancouver.us/cvtv/cvtvindex.asp?section=25437&folderID=2187>)
- Completed a field manual in March 2009 and held 2 training workshops on the manual with septic system O&M specialists.

Clark Public Utilities (CPU):

- Since November of 2007, eight restoration projects, totaling 30 acres of trees planted and 700 feet of bank stabilized, have been completed in the watershed.
- With the watershed becoming more urbanized, properties are being subdivided, making it more difficult to find potential large restoration sites. To that end, Clark Public Utilities prepared a brochure to recruit homeowners to partner with CPU for restoration projects.
- Successfully competed for a FY2010 Centennial Fund grant for additional riparian restoration in Salmon Creek.
- Partnered with the City of Battle Ground to provide assistance and guidance to a local church group that has adopted Woodin Creek.
- Enlisted the Stream Stewards to conduct water quality monitoring near CPU restoration sites.
- Worked with the Washington Department of Fish and Wildlife and Clark County to conduct redd surveys and wildlife monitoring on restored sites.
- Conducted an Earth Day tree planting that attracted 300 people and 16 organizations.
- Worked with school groups to provide hands-on activities along Salmon Creek.

Lower Columbia Fish Recovery Board

- In December 2008, a new watershed management rule was adopted for the Salmon-Washougal River Basin that establishes instream flows in the watersheds to protect natural resources, closes subbasins to future withdrawals, and specifies conditions

for accessing the water reserves (see http://www.ecy.wa.gov/programs/wr/instream-flows/lewis_salmon_washougal.html).

- Working with Clark County to develop a process to track permit-exempt wells.

Washington Department of Fish and Wildlife (information provided by Donna Bighouse prior to the meeting):

- Continued administering the Washington State Hydraulic Code by reviewing Joint Aquatic Resource Permit Applications and issuing Hydraulic Project Approvals.
- Continued reviewing SEPA applications to evaluate potential impacts on fisheries resources of the state and priority habitats and species.
- Hired a Growth Management Act/PHS biologist to oversee issues associated with critical area ordinances and priority habitats and species.
- Currently monitoring salmon to determine if last summer's replacement of the Kline Line Bridge over Salmon Creek affected fish passage to upstream areas.

Washington Department of Natural Resources (information provided by Rex Hapala prior to the meeting):

- Continued reviewing Forest Practices Applications.
- Continuing Road Maintenance and Abandonment planning and implementation.

Department of Ecology:

- Continued enforcing the state Water Pollution Control Act.
- Continued issuing NPDES permits under the Clean Water Act.
- Continued fulfilling responsibilities relative to municipal and construction stormwater permits.
- Continued providing assistance to local interests in obtaining grant and loan funds for implementation activities.



Table 1. Goals and Accomplishments Associated with Salmon Creek Fecal Coliform and Turbidity Total Maximum Daily Load Detailed Implementation Plan (accomplishments since November 2007 are in bold; details on previous accomplishments can be found in the November 2007 meeting report at <http://www.ecy.wa.gov/programs/wq/tmdl/SalmonCr/SalmonCr110707MtgRpt.pdf>).

Agency/Organization	Goals	Accomplishments
Clark Conservation District	Reduce fecal coliform and turbidity input from farm operations through education and technical assistance	Between 1999 and summer 2007: <ul style="list-style-type: none">- held 83 educational workshops and farm tours.- developed and distributed a number of educational publications.- mailed information to 1,747 landowners.- acquired a manure spreader and developed a manure exchange program.- provided technical assistance to over 120 landowners.- completed 21 Conservation Management Plans.- installed 1,851 feet of livestock exclusion fencing.- provided funding for planting of 9,815 riparian trees and shrubs.- provided three 8-12 week courses on stewardship of small acreage farms.- created a website for the conservation district.- installed one off-channel livestock watering facility.- developing 30 Small Farm Management and Resource Conservation Plans.- developing best management practices curriculum for high school students.- conducting livestock survey.- providing continuing education for real estate agents. <ul style="list-style-type: none">- completed a regional livestock inventory in 2008.- developing a guidebook for rural landowners.- received a grant in 2009 to fund outreach to livestock owners on water quality issues.

	Reduce pollutants in stormwater through education and outreach	<p>Through November 2007:</p> <ul style="list-style-type: none"> - provided 98% of funding support for the WSU Clark County Watershed Steward Program. - provided 75% of funding support for WSU Small Acreage Program. - awarded model/merit farm signage to 9 landowners. - conducted 10 farm tours. - conducted 2 small Acreage Expos. - conducted stormwater assemblies at 25 schools in the watershed. - examined every stormwater outfall in Mill Creek and Curtin Creek to detect illicit discharges. <p>- developed Canines for Clean Water outreach program in 2008.</p>
Clark County Public Health	Reduce fecal coliform input from on-site septic systems	<p>Through November 2007:</p> <ul style="list-style-type: none"> - mailed information to over 7,000 homeowners. - held 12 maintenance and operation workshops. - surveyed 584 homes to verify status of septic systems. - ensured correction of 36 failing systems. - tested 12 sites with suspected water quality violations. - added 4,000 sites to the Operation and Maintenance database. - provided one homeowner with a loan to replace a failing system. - in October 2007, county passed an ordinance to strengthen regulations related to on-site septic systems. <p>November 2007 through May 2009:</p> <ul style="list-style-type: none"> - continued implementing On-site Septic System Operation and Maintenance (O&M) Program.

		<ul style="list-style-type: none"> - continued adding previously unknown systems to database. - developed an outreach video on the program. - developed a field manual and held two training workshops for O&M specialists.
Clark Public Utilities	Work with landowners to reduce fecal coliform and turbidity input by restoring riparian areas	<p>Through November 2007:</p> <ul style="list-style-type: none"> - 10,000 linear feet of livestock exclusion fencing installed. - 2,500 feet of diked and channelized stream reconnected to the floodplain. - 121,820 trees planted in riparian areas (116 acres; 23,280 feet of stream length). - approximately 125 restoration projects were completed and seven planned as of October 2006. <p>November 2007 through May 2009:</p> <ul style="list-style-type: none"> - 8 restoration projects completed. - 30 acres of trees planted. - 700 feet of streambank stabilized. - prepared recruitment brochure to solicit additional homeowners for restoration projects. - received grant in 2009 to fund additional restoration projects in the watershed. - partnered with city of Battle Ground to provide assistance on a stream adoption program. - partnered with Water Stewards to monitor water quality at restored sites. - partnered with Department of Fish and Wildlife and Clark County to conduct fish and wildlife monitoring at restored sites. - conducted the annual Earth Day tree planting.

<p>Lower Columbia Fish Recovery Board</p>	<p>During development of the various fish recovery strategies, provide data on stream restoration needs</p> <p>Prioritize and fund projects for stream restoration</p>	<ul style="list-style-type: none"> - completed Limiting Factors Analysis, determined restoration priorities, and developed habitat restoration workplan prior to November 2007. - a new watershed management rule was adopted in December 2008 that establishes instream flows. - working with Clark County to develop a process to track permit-exempt wells. - WRIA 27/28 Watershed Plan completed in 2006. - WRIA 27/28 Detailed Implementation Plan completed in 2008; monitoring strategy under development.
<p>Washington Department of Agriculture</p>	<p>Reduce fecal coliform input from livestock by inspecting dairy farms and managing dairy permits and non-dairy permitted facilities</p>	<ul style="list-style-type: none"> - unknown
<p>Department of Ecology</p>	<p>Provide technical assistance to municipalities for stormwater program</p> <p>Provide assistance to local interests in obtaining grant and loan funds</p> <p>Issue NPDES permits under the Clean Water Act</p> <p>Enforce state Water Pollution Control Act (RCW 90.48)</p>	<ul style="list-style-type: none"> - filled a new position dedicated to municipal stormwater in 2007. Assistance is ongoing. - ongoing - ongoing - ongoing - conducting effectiveness evaluation of TMDL activities in 2009.
<p>Washington Department of Fish and Wildlife</p>	<p>Administer the Washington State Hydraulic Code (RCW 77.55) through Hydraulic Project Approvals.</p>	<ul style="list-style-type: none"> - review about 50 hydraulic permit applications for the watershed each year.

	<p>Provide technical assistance to the public and other agencies on reducing sediment delivery from projects conducted within waters of the state.</p> <p>Provide technical assistance to local municipalities by updating and revising Critical Area Ordinances and Priority Habitats and Species</p>	<p>- review about 300 SEPA applications for the watershed each year.</p> <p>- in 2008-2009, began monitoring near Kline Line Bridge to determine if bridge replacement affected upstream access for salmon.</p> <p>- filled a new position dedicated to growth management act issues in 2008.</p>
Washington Department of Natural Resources	Reduce sediment input by implementing Forest and Fish Act requirements with private and state forest landowners	<p>- 478 Forest Practices Applications were reviewed for the Vancouver WAU between January 1995 and October 2007; 48 of those applications were reviewed between 2005 and 2007. Review is ongoing.</p> <p>- In DNR Pacific Cascades Region, 2,322 RMAPS were reviewed and 349 miles of forest road abandoned from 2001 to 2006. Activities are ongoing.</p>
Natural Resource Conservation Service	<p>Provide technical guidance for Clark Conservation District</p> <p>Provide technical and financial assistance to farmers</p>	<p>- unknown</p> <p>- Prior to November 2007, two landowners received funding for manure storage to reduce runoff to creek.</p>