Soos Creek watershed streams are too warm, have too little oxygen and aquatic habitat is degraded

Fish breathe oxygen in the water. Cooler water holds more oxygen in the form of dissolved oxygen. When water is too warm or has too little oxygen, local fish can face thermal stress and harm. Parts of Big Soos Creek and its tributary streams in King County exhibit unhealthy temperatures and oxygen conditions that cause them to fail Washington state water quality standards. Additionally, there is concern about degraded channel conditions in Soos Creek due to the effects of increasing urbanization.

The Soos Creek system serves as important migration corridors and spawning and rearing areas for several fish species—Chinook, coho, sockeye, chum, and pink salmon; steelhead trout and cutthroat trout—that all need cold water and healthy stream habitat during their various life stages. In Soos Creek, Ecology set standards for stream temperature at 16°C (60.8°F) and dissolved oxygen at 9.5 milligrams/liter to protect the streams for salmon and trout spawning, rearing, and migration. Portions of Big Soos, Jenkins, and Covington creeks must also meet a lower temperature standard of 13°C (55.4°F) from September 15 to July 1 to protect salmonid spawning.

Low water flow, warm weather, and summer water temperatures create impacts that can become lethal for salmon. Development too near stream banks creates serious problems. Fertilizers and other nutrients entering streams worsen these problems. Areas often fail to provide cool water and vegetation to shield the stream from solar warming. Streams lose the capacity to provide habitat functions, and excess nutrients may lead to algae blooms and generally reduce dissolved oxygen levels. Restoring flow, providing shade, and improving stream habitat will help.

MEETING INFORMATION AND SCHEDULE

A study team including Department of Ecology, the Muckleshoot Indian Tribe, King County, EPA, and contractor TetraTech is developing a Water Quality Improvement Report about how these waters can support beneficial uses.

A stakeholder meeting will be held on July 17, 2012, from 1:30–4 p.m. at Covington City Hall.

Please let Ecology know if you are interested in receiving more information about the Soos Creek studies and improvement plan.

Contact information

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Special accommodations

If you need this document in a format for the visually impaired, call the Water Quality Program at 425-649-7105.

Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.

What affects stream temperature and oxygen?

- Solar radiation related to latitude; time of year; time of day; cloud cover; and how much shade is available to block warming effects of the sun.
- Stream depth and width; channel complexity; flow rate; and overall volume of water.
- Availability of cool groundwater to seep into the stream.
- Stormwater runoff, sediment, fertilizers and other nutrients entering streams.

Example of altered stream hydrology

Soos Creek issues

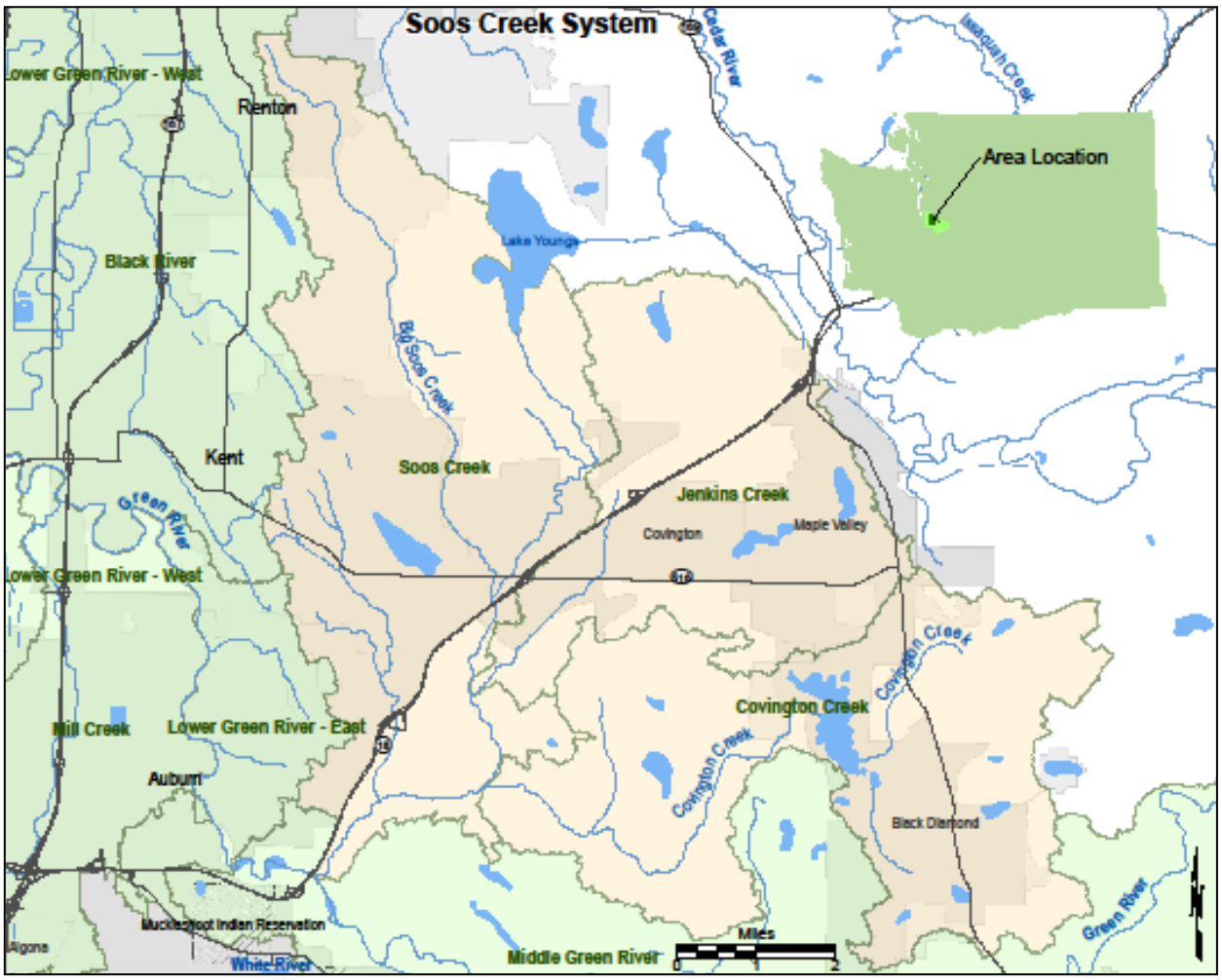
Solar heating: Trees and shrubs are important for shade, and their droppings help feed fish. When trees die and fall into streams, they create stream complexity supporting fish habitat. Altered urban streams often have streamside trees removed, can be channelized, and have lawn down to the streams edge. Tree removal exposes water to sun, and reduces cool microclimate zones near streams and rivers.

Water withdrawals: Other human-caused factors that increase stream temperatures include water withdrawals for various purposes, including municipal supply and irrigation. Well withdrawals can reduce the amount of cool water stored in the ground to feed local creeks during summer. Reduced flows make streams slower and shallower, allowing them to become warmer during the dry summer months.

Erosion: Winter stormwater runoff from impervious development results in high stream flows. High flows mean more runoff from polluted surfaces, more erosion, scouring, and sediment transport resulting in altered stream hydrology. Poorly managed construction sites, forest harvest areas, and agricultural areas can also contribute sediment runoff. Altered streams lack the natural stream mechanisms needed to sort gravels and create deep pools needed by fish for spawning and refuge. Sediment runoff also puts more nutrients in the water causing algae blooms and reduced oxygen.

Water storage: Floodplains and wetlands act to absorb, temper, and clean storm flows. Wetlands and floodplains can be lost and or become disconnected from streams by roads, houses, parking lots, and stream alterations. Detached or developed floodplains and wetlands can no longer do their job—to act like sponges, holding water in times when flows are high such as the winter, and be able to release the cooler stored water slowly during time of low flow or drought, typically during the summer months.

Impervious surfaces: Stormwater runoff from impervious surfaces such as roadways, roofs, and parking lots often flow immediately to streams. Impervious surfaces can cause loss of groundwater recharge, which reduces summer baseflow. A declining trend in late summer streamflows has been observed in some Puget Sound watersheds.



Understanding and correcting problems

When streams do not meet water quality standards or do not support designated beneficial uses, Ecology is responsible for developing a water quality restoration plan in collaboration with interested and affected parties. Computer modeling is often conducted to assist with development of the plan. Models can be an effective tool for evaluating potential water quality responses to potential restoration activities. In addition to modeling, monitoring may be conducted to further our understanding about water quality and stream habitat conditions. Additional monitoring is planned for the Soos Creek watershed, including the use of bio-assessment, which measures the relative health of aquatic organisms in the stream. This monitoring will be conducted at various locations throughout the watershed.

Results of these modeling and monitoring efforts will be used to develop meaningful targets for stream conditions and pollutant loading sources. These targets may be in the form of shade, water quantity, impervious cover, stormwater flow, and/or biological measures that will help guide and measure effectiveness of water quality restoration activities in the watershed.

What can we all do to reduce stream temperatures?

Citizens and organizations, including local governments, can act now to help protect and restore water quality in the Soos Creek Watershed by taking at least one of the following actions to help reduce water temperature and improve dissolved oxygen in streams.

Protect and restore streamside vegetation: Get involved in restoration projects to plant trees and improve streamside (riparian) areas where streams have been straightened and trees have been removed. Streamside trees shade streams and help reduce air temperatures by providing a cool microclimate near the stream and increase streambank stability. Plants help filter sediments, fertilizers, and other nutrients from streets, lawns, and agricultural areas.

Conserve water: Increased flow in streams keeps water cool. Practice wise use of water near streams to help protect flows during late-summer low-flow conditions. Reduce lawn areas for watering and use less-consumptive irrigation methods. Deep soak early in the morning or late in the evening to minimize evaporation and leave more water in the stream or in groundwater, helping 'recharge' streamflows.

Let streams meander and dead trees fall into streams: Letting streams wander allows stream channels to reconnect to floodplains and wetlands and helps prevent shallowing due to sedimentation and widening from erosion. Reconnected streams provide cool groundwater, woody debris, and insects that fall into water and provide food for fish.

Reduce impervious areas: Consider putting in a rain garden or using pervious pavement. Less pavement near streams reduces precipitation becoming heated by the sun and allows more water to infiltrate cooler soils. Reduced impervious surface throughout the basin recharges and conserves water in the ground for dryer seasons. Water allowed to infiltrate during storms does not run off to waterways so quickly and helps reduce flooding.

Keep nutrients and organic material out of streams: Use proper erosion control practice during construction activities. Keep grass clippings and other organic material out of streams. Prevent overuse and runoff of fertilizers. Keep soaps out of streams—if washing cars at home use biodegradable soaps and wash cars on lawns. Carefully manage domestic animals and livestock wastes; pickup, cover, and keep away from streams.

Developing an action plan for the Soos Creek watershed

Ecology needs help to develop a plan to bring down stream temperatures in the Soos Creek watershed. The implementation plan for Soos Creek temperature and DO TMDL will be developed with help from local government agencies, the Muckleshoot Tribe, EPA, businesses, and residents. The coordinated and sustained efforts of all these groups will be needed for these plans to be effective.

To receive future announcements of the status of the Soos Creek Watershed TMDLs, please contact:

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Email: joan.nolan@ecy.wa.gov; Phone 425-649-4425. See future updates at:
www.ecy.wa.gov/programs/wq/tmdl/SoosCreekTMDLsummary.html