

Water in Green River and Newaukum Creek is Too Warm

Streams in these watersheds need your help!

Cool streams are important for water quality in the Middle and Lower Green River Watersheds. Water quality standards are established to protect the most sensitive beneficial uses of local waters: salmon and trout spawning, rearing of young, and fish migration. As water temperatures heat up, typically during summer lower-flow periods, fish become physically stressed and are more likely to get diseases. This can also affect fish respiration because warm water doesn't hold as much oxygen—critical for salmonid life stages, as colder water. If temperatures get above the lethal limit (77°-78°F), most salmonids will die or become dangerously stressed.



Federal and state laws require corrective actions for impaired waters. More importantly, most Washington citizens take seriously our responsibility to protect and restore our waterways now and for those in the future.

What affects stream temperature?

Factors that affect stream temperature can occur from both natural and human-causes in the watershed. These include:

- Solar radiation—related to latitude, time of year, time of day, cloud cover, and how much shade is available to block the sun which heats both water and air.
- Stream depth and width, flow rate, and overall volume of water.
- Availability of cooler groundwater flowing into streams.

WHY IT MATTERS

Warm water holds less oxygen and can harm fish and other aquatic creatures. Parts of the Green River and its tributaries, including Newaukum Creek, serve as important migration corridors and spawning and rearing areas for salmon species that require cold waters for optimum health and survival. Additionally, warm water may be a factor in the presence of bacteria, viruses, and other human pathogenic organisms.

These water bodies are too warm, fail Washington's water quality standards, and cause thermal stress to fish during various life stages. Affected species include Puget Sound Chinook and Bull Trout (both "threatened" under the Endangered Species Act), coho, chum, pink, sockeye, and steelhead/rainbow and cutthroat trout.

Ecology is seeking comment on the plans for improving these water bodies thru June 23, 2011. We will hold a public meeting at 6:30 p.m. at the Auburn City Hall on June 14.

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.

Streamside vegetation is the key!

Trees and shrubs create important shade. Their removal increases the amount of sun that can hit and warm water, and reduces cool microclimate zones near streams and rivers. In considering the many decisions we make in choosing our watershed land management activities, the absence of such plants is the *major* factor that increases stream temperatures. *Tree removal reduces the amount of shade on the water and allows more sun to heat the stream.*

Erosion: Another problem related to tree removal is the erosion arising from poorly-managed forest lands, agricultural areas, or construction sites that results in bank deterioration and landslides. These events can cause heavy sediment loads and flooding as they make streams shallower and wider. All this allows more sun on the water, reduces available high quality salmon spawning habitat, and affects how well colder groundwater interacts with surface waters to cool streams.

Water withdrawals: There are other human caused factors that increase stream temperatures too. Less water means warmer water. Water withdrawals for various purposes, including irrigation, reduce the amount of cool water stored in the ground to feed the local creeks during the summer when flows are already critically low. Reduced flows make streams slower and shallower, allowing them to become warmer during the dry summer months.

Impervious surfaces and wetland destruction: Areas of impervious surface such as pavement and wetland destruction, allow more runoff water to heat up and flow directly to waterways. (Remember the *hot tin roof* effect, and going barefoot over hot blacktop in the summertime?). And as wetlands disappear, the sponge effect that helps store precipitation and that contributes cool water in summer seasons is lost. This can also worsen seasonal floods.

Green River issues

The middle and lower sections of the river need more shade. Currently, the system of levees, low water flow, warm weather, and summer water temperatures create impacts that can become lethal for salmonids. Portions of the river below Howard Hanson Dam and upstream from Auburn need improvement, but below Auburn conditions worsen. Levees, roads, and development too near the banks of the river create serious problems. These areas fail to provide cooling vegetation and shade to block heat from the sun, have lost the capacity to provide habitat functions, and generally inhibit good water quality. Shade will help.

The Green was one of the most productive salmon rivers in the state, but at least one major salmon run has gone extinct and others are suffering.

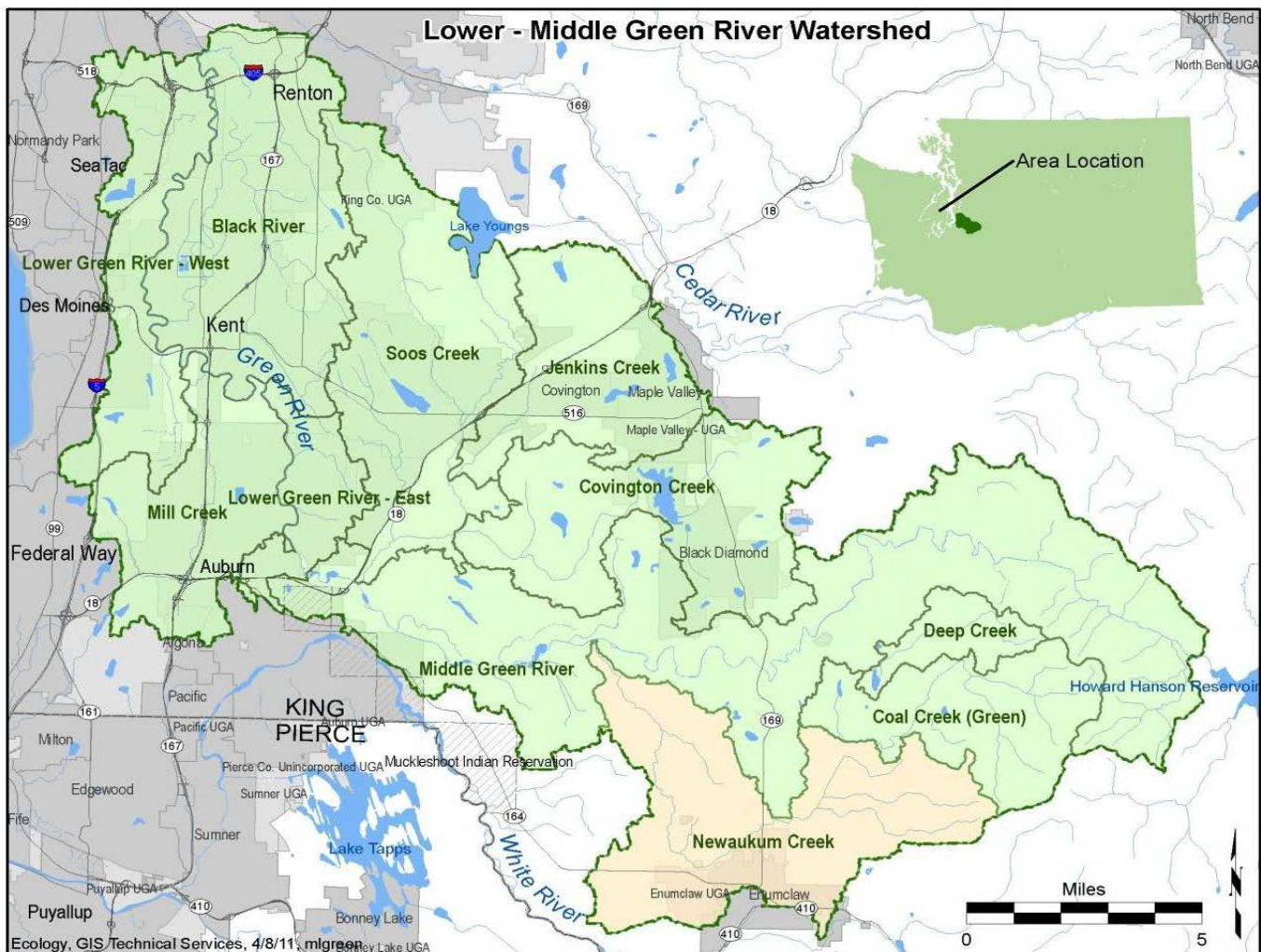


Tributary to Newaukum Creek

Newaukum Creek issues

Newaukum Creek is one of the major tributaries of the Green River and supports several salmon and trout (salmonid) species including Puget Sound Chinook. The creek is too warm during summer and may be harming these fish that need cold water to survive.

Maximum summer temperatures exceed the 16°Celsius (60.8°F) standard for salmon summer habitat. Ecology expects that plantings of streamside trees and shrubs for shade will improve stream temperatures. The middle *plateau reach* of Newaukum Creek or the Enumclaw Plateau needs the most shade.



Understanding and correcting problems

When a stream appears to be too warm, Ecology collects water quality data to confirm the problem and collaborates with others to understand and improve water quality. Ecology and its community partners used detailed monitoring data and analysis to develop computer models for the Green River and its tributaries. These models help us all understand how factors such as streamside vegetation, sunlight, wind speed, and stream flow relate to stream temperature.

Modeling results were used to help develop effective solutions that the local community can act on to lower stream temperatures during critical periods. These steps will improve water quality and help prevent loss of threatened and endangered fish species and other sensitive organisms.

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 Green River Watershed by taking at least one of the following actions to help reduce water temperatures in streams.

- **Protect and restore streamside vegetation:** Get involved in restoration projects to improve streamside (riparian) areas where streams have been straightened and channelized and trees have been removed. Trees shade the water, create cool microclimates, and increase stream bank stability. Restoration projects help prevent stream shallowing from sedimentation and widening from erosion, and can help re-establish connections with the natural floodplain and with cool groundwater resources. Woody debris, native plant material, and insects that fall into water can also provide food and habitat for fish.
- **Plant tree borders:** Streamside landowners can plant trees that shade streams and help reduce air temperatures by providing a cool microclimate near the stream. Plants also filter excessive amounts of sediments, fertilizers, or other nutrients from lawns and agricultural areas.
- **Conserve water:** Increased flow in streams helps keep the water cool. Practice wise use of water near streams to help protect flows during late-summer low-flow conditions. Reduce lawn areas for watering or use less-consumptive irrigation methods. Use deep soaks early in the morning or late in the evening to minimize evaporation and leave more water in the stream or in groundwater resources that ‘recharge’ stream flows.
- **Reduce impervious areas:** Less pavement near streams for roads or parking lots reduces precipitation becoming heated by the sun and allows a greater proportion to infiltrate cooler soils. This 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.

Developing action plans for the Green and Newaukum watersheds

Ecology’s plans to bring down stream temperatures for each of these watersheds were developed with help from local agencies, Native-American tribes, businesses, and residents. The coordinated and sustained efforts of all these groups are needed for these plans to be effective.

Review copies are also at local libraries for comment until June 23, 2011.

Send comments to:

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See: <http://www.ecy.wa.gov/programs/wq/tmdl/GreenRvrTMDLsummary.html>

Please consider coming to a public meeting to learn more:
Auburn City Hall Council Chambers June 14 at 6:30 p.m.