



BEST PRACTICES



Streams, Drought & Salmon

How can the rainy Pacific Northwest be experiencing a drought?

The Pacific Northwest has a lot of rain. It's what we are known for! It's also what helps nourish so many plants and trees in our iconic evergreen forests. With so much rain, how could Thurston County be experiencing a drought?

The average rainfall for Thurston County is 52 inches per water year. In the 2018-19 water year, we received only 39 inches of rain—just 3/4 the average rainfall for the County! When rainfalls are not meeting the county average, this is considered a drought. In addition, this past October and November of 2019 were even drier than the previous year. A dry year followed by multiple dry years is not good for our streams and salmon!

What does a drought mean for streams and salmon?

Low rainfall directly affects streams and salmon. Most streams in Thurston County depend almost entirely on rainfall to keep them flowing with cold water during our hot, dry summer months. The Nisqually River is the only exception, which also receives water from melting snow on Mount Rainier. For the rest of our waterways, less rain means less water to replenish our thirsty streams. Periods of drought also affect plants and trees that help shade our streams. In Washington State, we have been experiencing multiple years of lower than average rainfall and drier hotter summers. These drought conditions have affected our forests with increased losses of native trees including western red cedar, western hemlock and big leaf maple.

How do winter rains keep our streams flowing in the hot dry summer months?

Rainwater that soaks into the earth flows underground and eventually into streams, lakes and Puget Sound. The water flowing underground is called groundwater. It takes a few months for the groundwater to reach our streams. If you dip your hand (or foot) in one of our streams in the summer, the water is cold (even when it is hot outside). That's because the cold rain that soaked into the ground is insulated from the heat of the sun. The water is then gradually released into the streams keeping water levels up and temperatures cool. Less rain soaking into the ground, equals less stream flow and warmer streams.

Streamflow levels over the past summer and fall appear to be some of the lowest levels we've had on recent record. Over the last two years, we've seen chum waiting longer than usual to swim up McLane Creek in November and December due to low water levels. After they made it upstream, the water was barely deep enough for them to dig their nests and lay their eggs.

What is a Water Year? The water year generally begins at the start of the rainy season. For us in the Pacific Northwest, the water year begins Oct. 1 and ends Sept. 30 of the following year. Thus, the 2018-2019 water year began on Oct.1, 2018 and ended on Sept. 30, 2019.



Less water equals warmer temperatures

The sun heats shallow water faster than deeper water. Warmer stream temperatures affect salmon health and survival. Cooler temperatures are especially important during spawning and while eggs are developing in their gravel nests.

During the 2017-2018 water year, the temperatures in 11 of 19 streams that provide core summer habitat exceeded the maximum standard of 16.0°C (60.8°). More than ½ of the streams sampled were too hot!

What's even more concerning is that water temperatures in our streams appear to be increasing over time. Thurston County Environmental Health regularly gathers stream data, including stream temperatures. They looked at 11 years of stream temperature data for 31 sites and found that stream temperatures are increasing at 29 of the 31 sites. All 29 sites provide habitat for salmon at various stages of their lives.

Oxygen levels are decreasing too

Salmon and other animals that live in streams need oxygen just like humans. Most of them breathe or absorb dissolved oxygen (DO) from the water. In the 2017-2018 water year, more than half of the core summer habitat stream sites had DO levels below the minimum standard for salmon. Monitoring data from the past 11 years shows that DO levels are decreasing at 31 sample sites during the wet season. So, not only are oxygen levels too low now in our streams, but they are continuing to decrease over time.

What can we do to help streams & salmon?

No matter where you live, you can do something to help streams and salmon!

- Use less water on your lawn and gardens
- Plant native trees, shrubs and flowers that use less water
- Help rainwater soak into the ground by installing a rain garden or replace hard surfaces with permeable material (Visit nativeplantsalvage.org/rain-garden for more info.)
- Volunteer with Stream Team to plant trees! Trees growing along streams provide shade keeping the water cooler.

By using less water and helping more water to soak into the ground, more cold water can flow underground into our streams creating a safe and healthy habitat for salmon! To learn more or to get involved, visit www.streamteam.info.

Source: Stream Team News, Spring 2020



Core Summer Habitat

Streams designated as core summer habitat for salmon provide habitat for:

- Spawning
- Emerging of fry
- Finding food
- Resting

Warmer temperatures affect young salmon by:

- Lowering the supply of oxygen
- Developing smaller yolk-sacs (which is a salmon's first supply of food)
- Increasing risk of deformity
- Allowing higher rates of bacteria and viruses
- Lowering survival rates

