



# NONPOINT SOURCE SUCCESS STORY

## Washington

### Targeted Implementation Reduced Bacteria Levels in Stearns Creek

#### Waterbody Improved

Bacteria from nonpoint sources caused violations of state water quality standards in Stearns Creek, a tributary to the Upper Chehalis River in western Washington, south of Puget Sound. As a result, Washington State Department of Ecology (Ecology) added Stearns Creek to the 2002 Clean Water Act (CWA) section 303(d) list of impaired waters. Ecology staff partnered with state and county agencies, tribes, and local residents and businesses to find and fix the sources of bacterial pollution in Stearns Creek. In 2018–2019, Ecology staff worked closely with local property owners to establish bracket-sampling locations, collect weekly samples, and review new data results. During this time, a collaborative approach to voluntary implementation of best management practices (BMPs) helped to improve water quality quickly and at low cost.

#### Problem

Stearns Creek is in western Washington, south of Puget Sound (Figure 1). This small stream is just west of the city of Chehalis, within the Chehalis River watershed in Lewis County. Fecal coliform bacteria concentrations showed seasonal increase during the summer months.

Data collected in 1998–1999 showed that Stearns Creek violated the applicable fecal coliform water quality standard, which called for a geometric mean of 100 colonies (col)/100 milliliters (mL) of water with no more than 10% of samples greater than 200 col/100 mL. As a result, Ecology added Stearns Creek to the 2002 CWA section 303(d) list of impaired waters for failing to support its primary contact recreation designated use. In 2004, Ecology developed a total maximum daily load (TMDL) for the Upper Chehalis River watershed, which included Stearns Creek. The TMDL noted that a 55% reduction in bacteria would be required for the creek to meet standards.

The Chehalis Tribe ambient water quality monitoring program identified bacteria exceedances in Stearns Creek and shared their data with Ecology's Southwest Regional Office nonpoint staff. Data collected in 2017 indicated that Stearns Creek contained high concentrations of bacteria when compared to other streams in the watershed. This prompted Ecology staff to develop a pollution identification and correction project in 2018–2019 to trace the possible sources of pollution contributing to the water quality exceedances. During a Stearns Creek watershed assessment

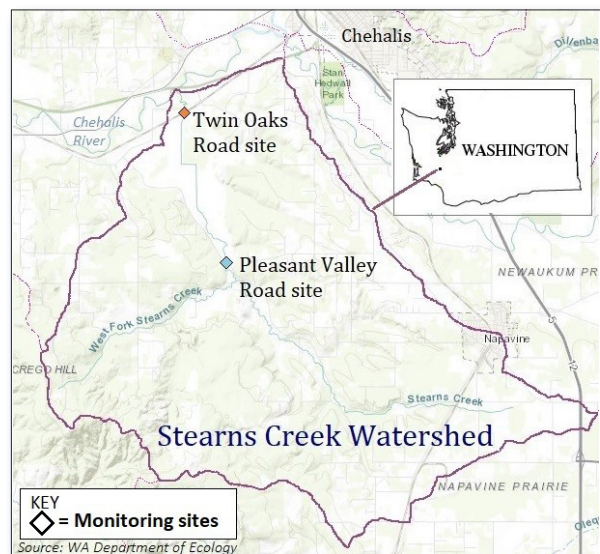


Figure 1. Stearns Creek is in western Washington.

in 2018, Ecology identified potential bacterial sources that included agriculture (e.g., livestock), wildlife and wastewater from human activities.

The Stearns Creek Valley has a long history of agriculture in Lewis County; some families have lived in this area for up to seven generations and remain strong stewards of the land. Many residents initially were cautious about working with the state government and allowing staff to conduct water sampling on their property. However, with effective partnership-building and transparency in data and project goals, the local residents slowly bought into the project.



Figure 2. Landowners installed fences along the creek to exclude livestock from the riparian areas.

## Story Highlights

The Chehalis Tribe Water Quality Coordinator and Ecology staff collaborated on monitoring efforts in Stearns Creek in 2018–2019 to find bacteria sources. The tribe shared their monthly sample data with Ecology to track any improvements in water quality. Staff from both organizations collected samples at the Pleasant Valley Road/Stearns Creek site and 2.5 miles downstream at the Twin Oaks Road/Stearns Creek site (see Figure 1). Data collected by both organizations showed that exceedances continued to occur at the downstream site during the summer months.

Ecology monitored upstream and downstream of multiple suspected bacteria sources (i.e., bracket sampling) in August 2019 to isolate locations where bacteria entered the creek. Local residents received these data, and many opted to voluntarily implement BMPs at problem spots. BMPs included 3,000 linear feet of new fencing along Stearns Creek to prevent cattle from directly accessing the creek (Figure 2), new pasture management with rotational grazing efforts, and refined manure application methods. Project partners also identified locations of potential septic system failures and referred them to the Lewis County Environmental Health Department for repair.

Ecology staff work in many different watersheds to find and fix sources of pollution affecting surface and ground water quality. With limited staff covering a large area, the keys to success for the Stearns Creek project (and other watersheds), have included: (1) building strong partnerships with local property owners and federal, state and local organizations; (2) conducting bracket water quality sampling to identify hot spots; and (3) sharing data and working directly with the

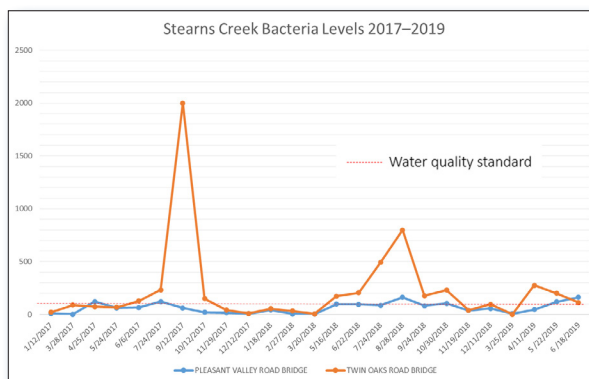


Figure 3. The magnitude of bacteria spikes at the downstream monitoring site dropped during the project period.

landowners to help them understand the impact of their current operations on water quality and to encourage long-term behavior change to prevent future pollution.

## Results

Data provided by the Chehalis Tribe indicate that bacteria levels in Stearns Creek were very high in the summer of 2017 and have declined since then, although some bacteria spikes continue to occur (Figure 3). Data showed that average bacteria concentrations have dropped from an average of 627 col/100 mL in 2017 (April–August) down to 214 col/100 mL in 2019 (June–October)—a drop of about 65%.

Given the immediate drop in bacteria concentrations, Ecology nonpoint staff planned to continue using data from the Chehalis Tribe to track progress in this watershed. However, the tribe could not consistently conduct monthly sampling data in 2020 due to staffing limitations during the COVID 19-pandemic. The tribe plans to continue monitoring in 2021.

## Partners and Funding

Many partners contributed to reduction of bacteria in Stearns Creek, including the Confederated Tribes of the Chehalis Reservations, Washington State Department of Ecology, Washington State Department of Agriculture, Lewis County Environmental Health Department, Lewis Conservation District, the Port of Chehalis, and Stearns Creek landowners. Landowners funded the BMPs they implemented on their own properties. Ecology used annual CWA section 319 funding to support salaries for nonpoint source staff working on the pollution identification and correction project.



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