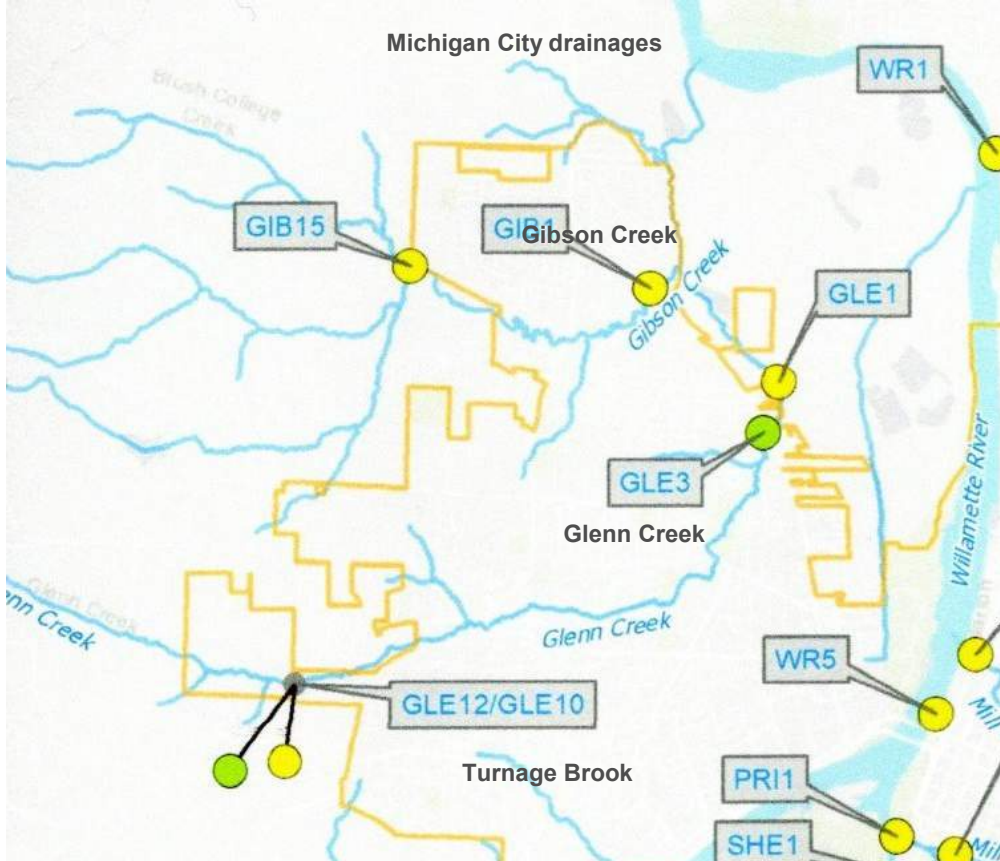


Watershed Events



Glenn and Gibson Creeks Watershed Council Newsletter

Summer 2021



There are 5 water quality monitoring stations in West Salem. The letters and numbers identify specific monitoring sites and stations.

How are we doing?

In this issue we take a look at the health of our watershed using information from the Oregon Department of Environmental Quality and the City of Salem

Focus will be on

- Water quality monitoring
- Effects of stormwater
- What we can do to maintain a healthy watershed



Continuous Instream Monitoring Stations in West Salem: **GLE 12** Upper Glen Creek at Hidden Valley Drive, **GLE3** Lower Glenn Creek at Wallace Road NW,

Monthly Instream Monitoring Stations in West Salem: **GIB15** at Brush College Road NW, **GIB1** at Wallace Road NW, and **GLE10** at Hidden Valley Drive NW and **GLE1** at Riverbend Road NW

What we know:

- Both Glenn and Gibson Creeks are listed on DEQ's 303d list for low dissolved oxygen and biological criteria <https://www.deq.state.or.us/wq/assessment/rpt2010/results303d10.asp>
- All Salem streams including Glenn Creek, Gibson Creek and their tributaries, are used as stormwater conveyances, impacting both stream structure and aquatic life. <https://www.cityofsalem.net/citydocuments/stormwater-master-plan-2020-FINAL.pdf>

City of Salem Monitoring

To comply with the requirements of their federal stormwater permit, the **City of Salem** monitors water quality within the city limits.

A summary follows, but for complete information, go to

<https://www.cityofsalem.net/Pages/stormwater-monitoring-helps-maintain-water-quality.aspx>

An automated sampler collects stormwater from the piped storm system for the duration of a selected rain event. These samples are analyzed for sediment, nutrients, and metals.

Grab samples from the pipes provide data on bacteria, pH, temperature, specific conductivity, turbidity, dissolved oxygen, insecticides, herbicides, fungicides, and mercury.

Instream monitoring: in stream monitoring stations report basic water quality parameters (pH, temperature, specific conductivity, turbidity, dissolved oxygen, and stream height) every 15 minutes, 24 hours a day, 7 days a week. They send out an alarm if a drastic change is detected, alerting staff to investigate.

Samples from 11 City streams and the Willamette River are collected once a month; analyzed for pH, temperature, specific conductivity, turbidity, dissolved oxygen, nutrients, and bacteria. This sampling has been done since July 2001, and is the City's longest set of water quality data.

Biological sampling

Stream assessment of different stream reaches is conducted periodically to gather information on aquatic insects, fish, and habitat within the stream.



Water Quality Limiting Factors

- **14% impervious surface watershed wide (varies by sub basin - Goldcrest Brook is 41% impervious)**
- **narrow stream setbacks**
- **Streams serve as stormwater conveyances**

How are we doing?*

• E.Coli

E. coli bacteria Summary: In 2019/2020, both Glenn and Gibson creeks generally tested low for *E. coli* bacteria, coming in under the *E. coli* bacteria Single Sample Criterion of 406 (count/100ml) set by Oregon DEQ. The downstream Glenn site (GLE1) saw the most exceedances (3) of the Single Sample Criterion.

E. coli bacteria comes from animal and human waste. Residents can help by picking up animal waste before the rain has a chance to wash it into storm drains and ultimately into the creeks.

• Dissolved Oxygen

Dissolved Oxygen (DO) Summary:

A good water quality reading for DO means that there is enough dissolved oxygen in the water to help fish and other aquatic animals breathe. Continuous data on Glenn Creek for 2019/2020 shows DO levels achieving Cold Water Criteria throughout the year. Both sites achieve and exceed Spawning Minimum Criteria (adequate levels of dissolved oxygen in the water to support spawning). They tend to fall below this level early in the year. Upper Glenn Creek site (GLE12) runs dry during summer and fall until rains start. Continuous data is not collected on Gibson Creek, but Grab sample data for 2019/2020 shows similar patterns.

Streamside residents play a vital role. A well shaded stream helps keep water cooler and cooler water is able to hold more dissolved oxygen. Residents can also help by ensuring that only stormwater enters storm drains and catch basins. Fertilizer runoff, for example, can contribute to low dissolved oxygen levels in streams.

* Information from City of Salem Department of Public Works



Gibson Creek at Brush College Park

Water Quality is affected by many things and is a good indicator of the overall health of a watershed. Healthy watersheds capture, filter, store and slowly release clean water. The higher the percentage of impervious surface (hard surfaces that will not allow water to percolate in and through) in the watershed, the lower the ability of the watershed to provide this natural water purification and storage.

In our urban and suburban watershed, a high percentage of the surface area is impervious. We live in dense neighborhoods filled with roofs, streets and lawns. Most precipitation falls and runs off, picking up pollutants from those hard surfaces. Surface pollutants include pesticides, oil, heavy metals, microplastic particles, animal waste, soil from construction sites, household chemicals, and soap

left on the pavement from washing cars. Even the part of our watershed that is not impervious likely has been altered in some way; through agriculture, timber harvest, gravel mining or some other use that has compacted the surface and lowered the ability of water to infiltrate into the soil. These non-urban uses come with their own set of pollutants that end up in ground or surface water.

Stormwater / Non point Source Pollution is the term used to characterize the rain and snow that falls on roofs, streets and roads, and other impervious surfaces, picking up the pollutants on the impervious surfaces and running into our streams either directly, or through the storm drain system emptying into our streams. In our watershed, the City monitors the impacts of stormwater on our streams.

Learn more at

<https://www.cityofsalem.net/citydocuments/stormwater-monitoring-plan.pdf>

Effects of Stormwater: Stormwater run-off affects water quality by the pollution it carries and by the physical impacts caused by the volume and force of the runoff. Erosion of the stream bank adds sediment to the water, increasing turbidity (cloudiness caused by particles often invisible to the naked eye). Turbidity affects aquatic life by reducing food supplies, degrading spawning beds and affecting gill function. The excessive force of stormwater entering the stream causes downcutting and destabilization of the stream bank. Gravels used by aquatic organisms for habitat and spawning are washed away. This scouring action washes away the material that acts to stabilize the stream structure. Goldcrest Brook is the best example of this in our watershed. This waterway has eroded to the point of threatening structures along the eroding banks. But Goldcrest Brook is not alone, all of our West Salem waterways are down cut. One way to check for this is to look at stormwater outfall pipe. If it was installed at the level of the stream bed, the distance from the existing stream bed to the pipe can determine the extent of the down cut.

Stormwater outfall into Glenn Creek currently about 12" above the existing streambed



Can stream structure be protected from the physical impacts of stormwater?

The City of Salem is authorized to discharge municipal stormwater to surface waters of the state from its stormwater system. Salem's permit requires implementation, adaptive management, and enforcement of its Stormwater Management Plan that is designed to reduce pollutants from stormwater to the maximum extent practicable, to protect water quality, and to comply with water quality standards and requirements of the Clean Water Act. The City balances management of urban streams to allow them to be as natural as possible within the limits of the narrow space allowed by the current 15' setback from the middle of the waterway. Removal of invasive species and replacement with native species is encouraged, as well as leaving as much habitat as possible and not interfering with natural stream processes. Streamside residents play a critical role in helping to maintain streamside habitat because much of the stream corridor is privately owned. Recommended actions include allowing a natural native buffer between stream and formal landscaping and removal of invasive plants.

Mitigation is the term for what the City does to minimize the impacts of both point and non point sources of pollution. In the City of Salem, stormwater utility fees help mitigate stormwater. Developers pay a stormwater development charge and are required to place infrastructure that captures and filters stormwater generated by new development. Riparian corridors have minimal protection, but are regulated to the extent that permits are required to remove trees and native plants within the riparian corridor.

Mitigation, con't

After 2014, ***Salem's stormwater discharge permit required the city to treat stormwater runoff for quality as well as quantity. The result is larger facilities with landscaping designed to filter stormwater prior to entry into receiving waters - our streams and rivers***

The City of Salem has a retrofit strategy and prioritization program that identifies detention facilities and other stormwater structures that can be retrofitted to include treatment of stormwater and retrofits those facilities when able. An example is the detention basin shown on the right. It started out as just a detention basin and was retrofitted to include the water quality swale at the bottom so it functions as both treatment and control. The City continues to look for more opportunities to improve detention facilities that were built to older standards, detaining only large storm events to now hold back water during smaller storm events that helps reduce erosive flows.



Part of the solution - this detention basin along Doaks Ferry Road NW is designed to treat water quality as well as retain storm water

What can we do?

Be Aware: Remember that everything we emit, use, drop, apply or otherwise leave on the ground, lawn, driveway, street, roof, car ends up in our streams. This includes herbicides and pesticides, fertilizer, motor oil, paint and paint thinner, animal waste, microplastics from tires, heavy metals from brake linings, construction materials. It is important to think about the ultimate destination of everything we use. **Street storm drains empty directly to our streams.**

Plant Natives and remove invasive species such as English Ivy and Armenian Blackberry: Native plants and trees are hardy. They are adapted to our climate and conditions and will require less water and no chemicals to thrive. They also support our native pollinators by providing food and habitat. Streamside residents play a critical role in helping to maintain streamside habitat because much of the stream corridor is privately owned. Allow a natural buffer between stream and yard, remove invasive plants, and plant with native plants, trees and shrubs.

Plant trees: In so many ways, trees are vital to the health of our watershed. Trees absorb pollutants and give back oxygen. They shade streams, lowering the water temperature and raising the level of dissolved oxygen. Their roots stabilize streambanks and provide aquatic habitat. Riparian forests are particularly important in carbon capture and storage as well as providing critical wildlife and bird habitat.

Rethink your Lawn: Lawns are monocultures generally maintained by chemicals that can wash into streams and contribute to water pollution. Gas powered mowers and blowers contribute to air pollution. Conventional lawns provide neither habitat nor nourishment. As an alternative, consider a mix of low growing pollinator plants to achieve the same landscaping effect. They will require less water and maintenance and will provide habitat for a variety of valuable insect life.

Consider a rain garden: A **rain garden** is a depressed area in the landscape that collects **rain** water from a roof, driveway or street and allows it to soak into the ground. Planted with grasses and flowering perennials, **rain gardens** can be a cost effective and beautiful way to reduce runoff from your property.

Pick up after your pet: E.coli shows up in our streams and it largely comes from animal waste. Use the handy mutt mitt dispensers bags and throw it all in the trash.

More information at: <https://www.cityofsalem.net/Pages/clean-streams-clear-choices-initiative.aspx>