



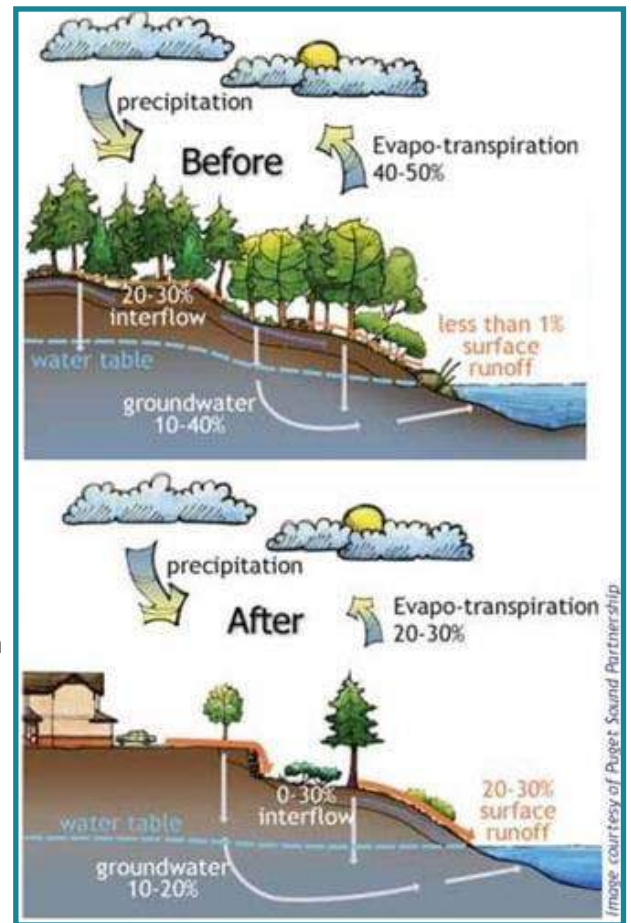
WATERSHED EVENTS

How do Watersheds Work?

Healthy watersheds collect, filter, store and slowly release precipitation. The importance of protecting good watershed function is difficult to overstate. When watersheds cannot capture, filter and store water, we see flooding during storm events and drought during dry spells, stream bank erosion due to volume and force of storm water run off, die off of aquatic organisms due to storm water pollution, and loss of habitat due to the reduction of coarse sediment supply. In urbanizing watersheds like Glenn and Gibson, we are seeing the amount of impervious surface increase with corresponding loss of watershed function.

Impacts of development

The conversion of farmland, forest, wetlands and meadows to rooftops, roads and lawns creates a layer of impervious surface in the urban landscape. Impervious cover directly influences urban streams by dramatically increasing surface runoff during storm events. Depending on the degree of impervious cover, the annual volume of storm water runoff can increase by two to sixteen times its predevelopment rate with proportional reductions in ground water recharge. *From the [Rapid Watershed Planning Handbook](#), EPA publication*



How Stormwater Regulations reduce impacts

The City of Salem's Storm Water Permit in 2012 required a study of storm water hydromodification (how alterations in land use change the hydrologic characteristics of streams) to Salem's streams and water quality and to develop strategies to address the changes. Current regulations require:

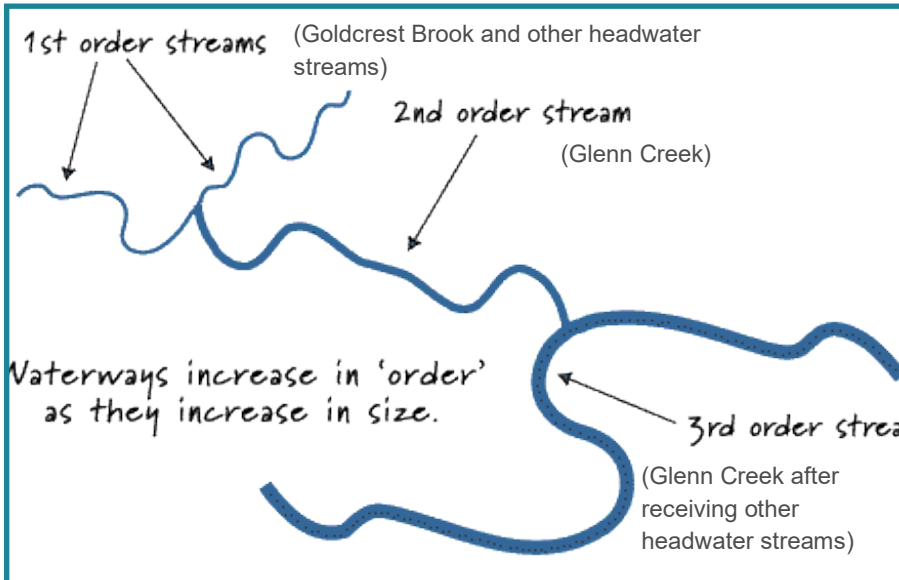
- Detain erosive flows by retaining post-development flows
- Required discharge rate \leq pre-developed discharge for 50% of 2 year, 24 hour storm
- Treatment of 80% of average annual rainfall
- Store 100 year storm event



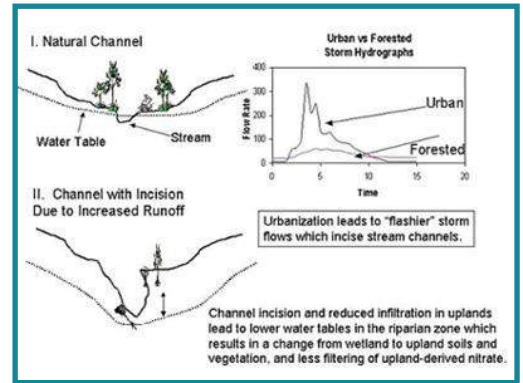
In This Issue

- The importance of small streams
- How West Salem streams are changing
- Preservation?
- Restoration?
- Good Neighbor Award

Photo courtesy of Peter Dalrymple, City of Salem



Goldcrest Brook, a first order stream, flows into Glenn Creek, a second order stream, which then becomes a third order stream as more streams flow into it



Changing streams

With development and hardening of the watershed, the physical characteristics of the stream channel change.

- The channels first deepen, then widen.
- The rocks and gravels that lined the bottom of the stream wash away, eliminating the habitat necessary to support aquatic life.
- Streamside vegetation no longer has soil or ground water, collapses and dies.
- Loss of streamside vegetation raises the water temperature, diminishing the oxygen level and making the water less able to support life. Streamside vegetation is critical habitat for most species. When lost, these birds, plants and animals no longer have a place.
- Water quality declines as pollutants from hard surfaces are picked up and washed through the streams. Water temperatures increase, dissolved oxygen levels decrease. Sediments suspended as fine particles increase turbidity.

The Importance of Headwater Streams

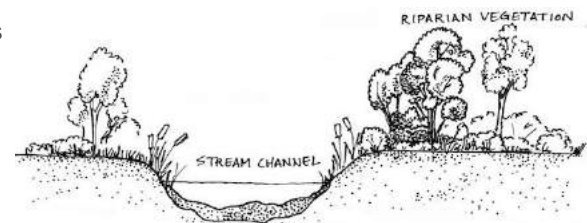
A stream that has no tributaries or branches is defined as a first order stream. When two first order streams combine, a second order stream is created. Headwater streams are defined as first and second order streams. These are the smallest streams, but they are crucial to watershed health because they dominate the watershed due to their numbers and length.

Headwater streams are typically short in length and drain relatively small areas but they are important because they comprise roughly 75% of the total stream and river mileage in the United States. While each headwater stream is short and narrow (Goldcrest Brook is 0.66 miles), they collectively represent a majority of the drainage network of any watershed. They are exceptionally vulnerable to development. It makes sense to focus on headwater streams in watershed preservation and restoration efforts.

How West Salem Streams are Changing

Because of increased development, West Salem's watersheds are changing and not in a good way. Recent stream studies show that our streams are becoming degraded. The stream channels are eroding due to higher and stronger flows from storm water that runs directly from paved and otherwise hardened surfaces into our streams.

Storm water erosion deepens and then widens our stream beds, removing the coarse sediments native to the stream bed along the way. This is important because native sediment is part of the habitat necessary for the many macroinvertebrates that support the web of aquatic life in the stream. That sediment also shields the stream bed from erosion. When that shield is gone, washed away by the force of the storm water flow, the stream channel begins to change.



Goldcrest Brook: developing a model

Because a concerned citizen noticed and then reported the rapid erosion of the streambank of Goldcrest Brook, the City of Salem is studying this headwater stream.

Findings include:

- Deeply incised channel
- Steep, slumping banks
- No coarse sediment
- Headcutting (small waterfalls in the stream bed)
- Exposed sanitary sewer laterals
- Bank failure (widening of the stream channel)
- Undermining of outfalls
- Roof drains throughout stream drain directly to stream
- Loss of streamside vegetation

Based on these findings, the City determined the need for a model to provide more information about the hydrology of Goldcrest Brook. The goals of the model include understanding the hydrological changes brought about by development, how to modify existing detention facilities so the problem does not become worse, how to stabilize the stream channel, and, if possible, restore better conditions to Goldcrest Brook



Goldcrest Brook fell through the regulatory cracks because:

- It is not in the FEMA mapped Special Flood Hazard Area
- Goldcrest Brook is residential development, exempting it from an SRC maintenance setback ordinance
- Riparian (streamside) vegetation is protected for 50 feet horizontally from the top of the streambank, but because this was formerly agricultural land, there was little to no native vegetation or trees along the streambank.

Goldcrest Brook (the blue line) map from Polk County ESRI file

What Can We do?

As a community, the City of Salem has taken action to strengthen storm water standards. Current standards specify retaining storm water flows, reducing the rate storm water is released, treating at least 80% of rainfall and storing a 100 year flood event. The study of Goldcrest Brook brought awareness of the need to protect streams with deeper riparian setbacks and better access to allow data collection and restoration. The need for better utility data collection was recognized.

As neighborhoods, we can protect and increase our tree canopy, especially within the riparian corridor. Trees reduce storm water runoff by capturing and storing rainfall in the canopy and releasing water into the atmosphere by evapotranspiration. Tree roots and leaf litter create soil conditions that promote infiltration of rainwater into the soil.

As neighborhoods, we can scrutinize proposed development. Through the neighborhood association and watershed council, we can ask that standards be met.

As individuals, we can try to capture every drop of water possible. Landscapes that include water capturing techniques such as rain gardens or vegetated swales and limiting impervious surfaces to a minimum can help protect our streams. Sweep your driveway rather than hose it, wash your car at a carwash that recycles their water, fix car leaks, clean up after your pets, properly dispose of hazardous household wastes, use bark or gravel for paths.



Good Neighbor Award

It is a challenge to run a gravel mining operation within sight of downtown Salem. Aside from the eagles and the osprey vying for the fish swimming in the gravel ponds and making sure your operation is secured and safe, when the call comes in to complain about gravel and mud on the road, you have to be ready to respond.

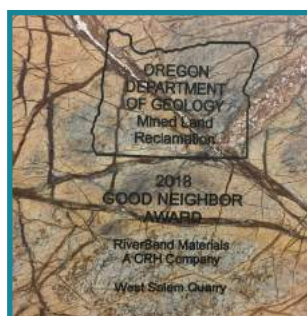
Mark Gregson, Site Foreman, and son Garratt Gregson, Aggregates Manager, rose to the occasion and for their quick response received the **2018 Mined Land Reclamation Good Neighbor Award.**

An early Monday morning call in February 2019 alerted the Department of Geology and Mineral Industries (DOGAMI) to mud and rock being tracked onto Riverbend Road. DOGAMI contacted Riverbend Materials, that contacted Mark Gregson.

Mr. Gregson quickly discovered the source of the soil was a residential construction site hauling soil from the site to the Riverbend Quarry for backfill. Riverbend hauled clean gravel base rock to the site so trucks were not running through the mud. Mr. Gregson then contacted a commercial sweeping company to clean the mud off of River Bend Road.



Engineered structure to prevent Willamette River channel migration



Contact Us

Give us a call for more information

**Glenn and Gibson
Creeks Watershed
Council**

P.O. Box 5005
Salem, OR 97304

(503) 362-6860

info@glenngibsonwc.org

Visit us on the web at
**https://
glenngibsonwc.org/**



Join us

We are always interested in new members or issues of interest to watershed health.

We meet at 5:30 pm on the 2nd Tuesday of every month in the Breezeway Room at Salemtowne
1800 Oakcrest Dr. NW,
Salem, OR 97304

