Stormwater Solutions: De-Paving Paradise And Fixing Up Parking Lots

- Katie Songer, Restoration Project Manager

Question: Where does rain go when it falls on the ground?

Answer: Across the pavement, into storm drains, through underground pipes, and, in many cases, into Johnson Creek. …In developed areas, that is.

In natural settings, rainwater filters into the soil, seeping through spaces between soil particles the same way water moves through the soil in a potted houseplant. Some groundwater is then taken up by vegetation. Some remains in the ground, winding up in aquifers. And some travels gradually to the surface again, finding its way into springs such as those that feed Johnson Creek.

But in urbanized areas, impermeable surfaces like roads, parking lots, roofs, and even compacted soil send water rapidly into ditches and city stormwater systems, where it travels through pipes that send it shooting into creeks and rivers from the outfalls lining the banks. When it rains, it pours—urban stormwater reaches streams much more quickly than natural groundwater, wreaking hydrological and biological havoc.

Gushing urban stormwater causes creeks to rise more rapidly than under natural settings. This phenomenon is called flashiness. A stream is flashy if it receives a lot of water from impermeable surfaces rather than from steadier, slower natural sources such as springs. (Think "flash" like quick—the water reaches the creek in a flash.) High, flashy flows lead to bank erosion and potentially increase flooding. Frequent flashiness also stresses wildlife—in high flows, fish and invertebrates expend valuable energy fighting the current, making refuge habitat like backwaters and large woody debris even more critical.

Flashy stormwater brings temperature swings, because surface water temperature varies more than groundwater temperature. Unbuffered by the ground and exposed to the air and the sun, surface water is warmer than groundwater in summer and colder in winter. In contrast, groundwater tends to remain at a steady temperature year round, usually the average annual air temperature of the local area. In Portland, this means groundwater temperature hovers around 54° F. (In Wisconsin it's in the 40s; in Florida it's in the 70s!) Since urban stormwater doesn't seep into the ground, influxes of stormwater bring frequent, strong fluctuations in temperature that add to the stressors for wildlife.

Last but definitely not least, flashy surface water washes sediment and toxics into streams. Picture the first rain after a long, dry summer. It's refreshing…but in urbanized areas, it carries all the spilled auto grease and oil from the last few months, along with whatever else lingers on the pavement. In natural conditions, soil filters many toxics out of the water. Impermeable surfaces prevent that process, sending the toxics right into Johnson Creek.

Is there any hope of saving the creek from such disaster? Yes! Stormwater solutions abound in our area, and every landowner (and sometimes even renters) have the opportunity to help. Downspout disconnection allows roof water to flow into lawns rather than into storm drains. Rain gardens and green roofs collect water for slow seepage and use. And in streets and parking lots, vegetated filter strips, bioswales, and permeable pavements help collect overland flow and send water into the ground. These and other innovative practices can reduce the amount of water in the storm system, thus reducing streams' flashiness, erosion, flooding, temperature problems, and pollution.

Stormwater management is a way for landowners and residents throughout the watershed to positively impact Johnson Creek. You don't have to live by the water to improve it—managing for stormwater is one way everyone can improve water quality. If you live in an urban area and are interested in learning more, check out your city's stormwater management program to find out about local resources.

This year, JCWC is initiating a new stormwater program as part of our ten-year Action Plan. We're beginning to work with businesses, schools, and churches in our watershed who are interested in "greening" their parking lots, adding features like vegetated filter strips or reducing impermeable surfaces. These larger landowners have opportunities to make a dramatic, positive impact on Johnson Creek, benefitting both the wildlife and the watershed community.

Cities are hard on streams. But by being creative and working together, we can go a long way towards reducing our urban impacts, and stormwater management is a critical part of that work.

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