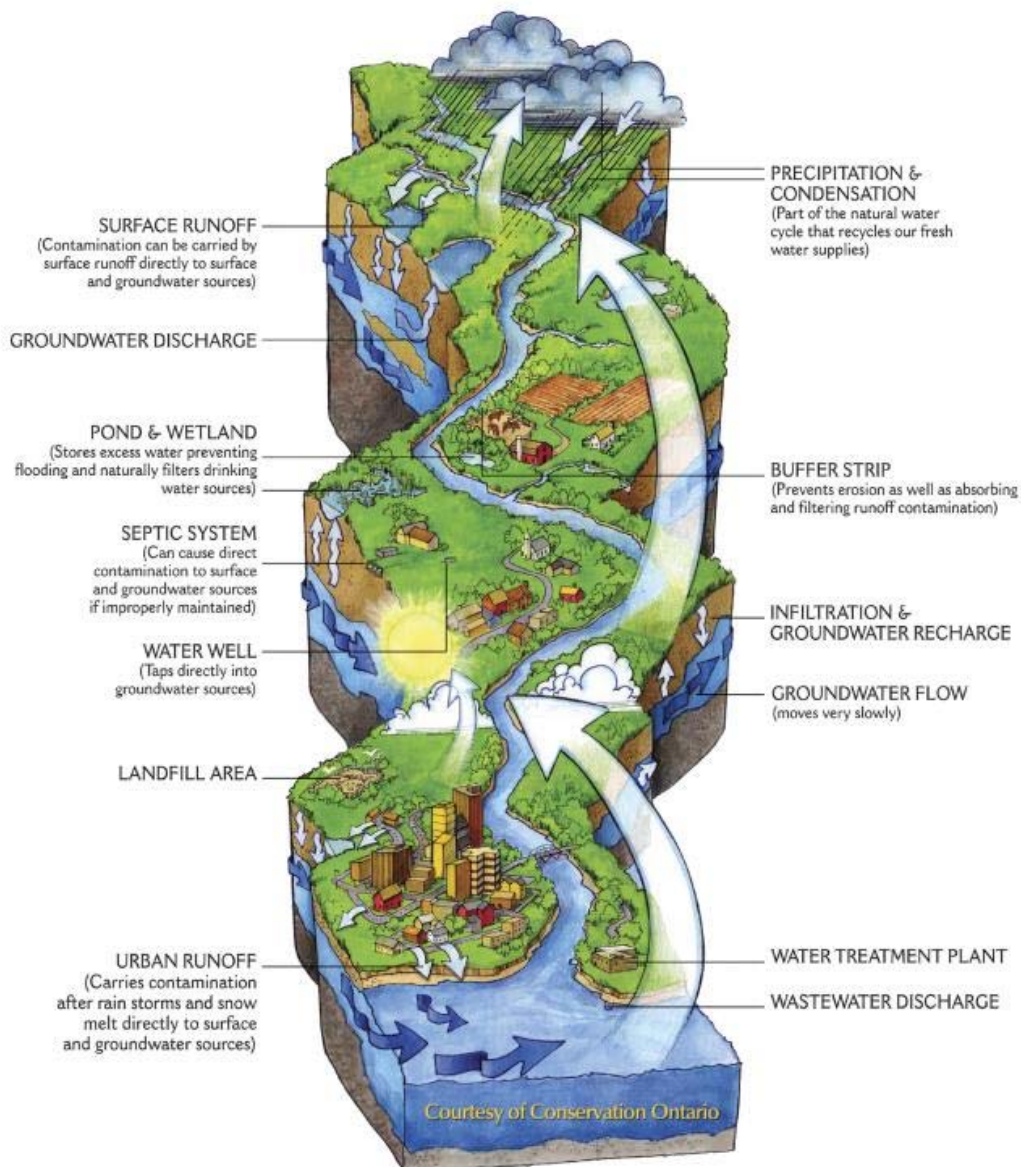
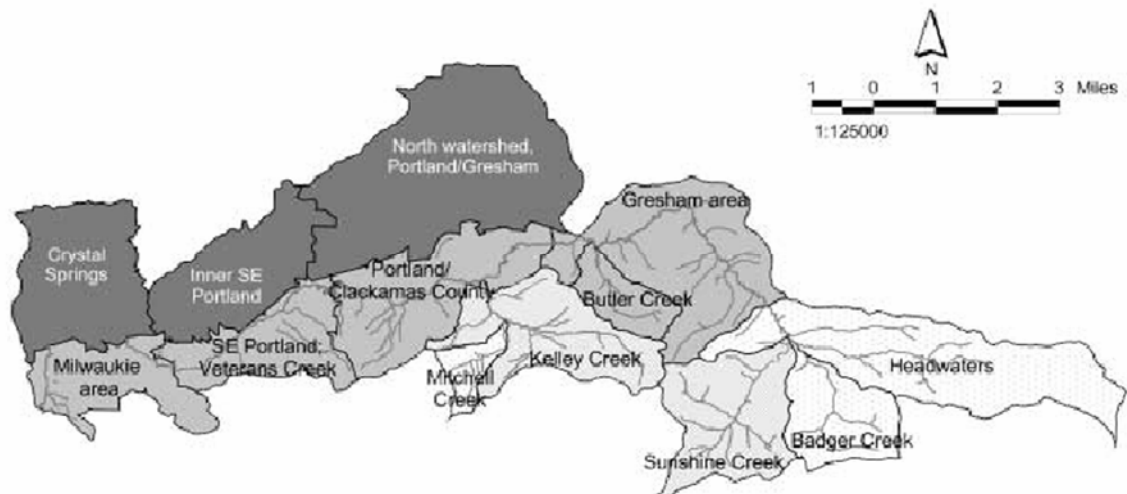


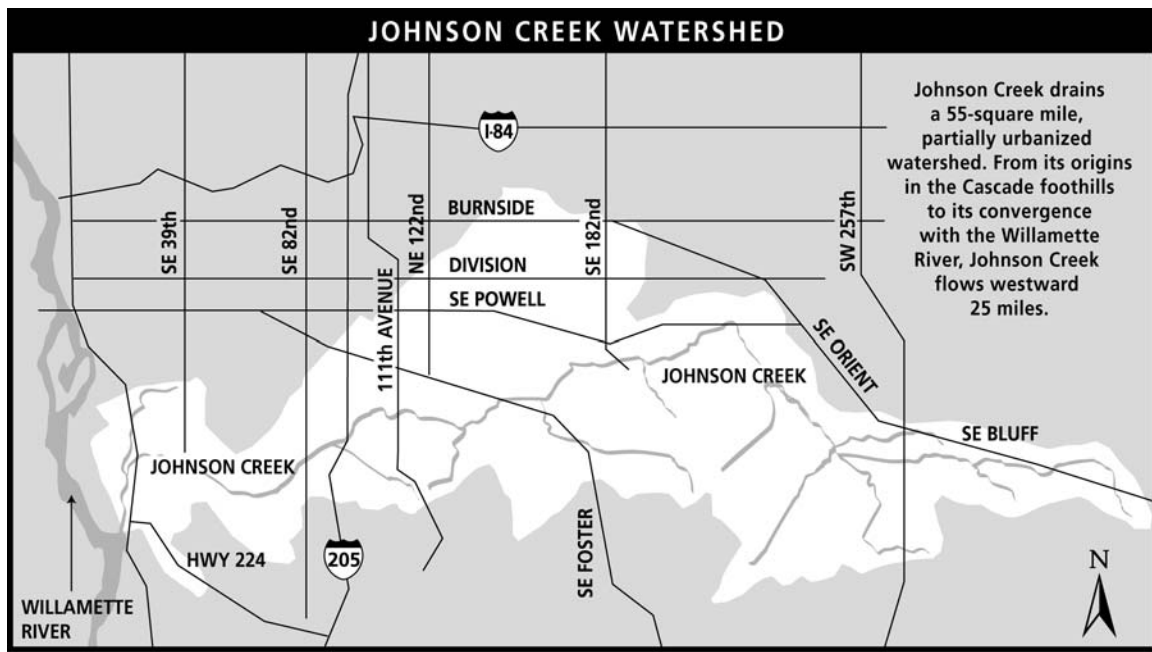
Johnson Creek Regional Information



A watershed is the entire area, from ridgetop to ridgetop, which drains into a river or stream.



Sub-watersheds of the Johnson Creek Basin



Johnson Creek Headwaters

The headwaters of Johnson Creek begin in the hills near the small, unincorporated area of Cotrell, southeast of Gresham in the foothills of the Cascades. The headwater region of the Boring Hills is around 750 feet above sea level. The creek flows westward approximately 25 miles to its confluence with the Willamette River in the city of Milwaukie. The watershed drains approximately 54 square miles (34,035 acres), and crosses six political boundaries—the cities of Gresham, Happy Valley, Portland, Milwaukie, and counties of Clackamas and Multnomah.

Some of the tributaries that feed into Johnson Creek are Crystal Springs Creek, Veterans Creek, Mitchell Creek, Kelley Creek, Butler Creek, Sunshine Creek, and Badger Creek.

Johnson Creek watershed is relatively flat topographically, and the slope of its mainstem, from headwaters to confluence, is atypical. A typical mainstem is characterized by a steeper slope at the headwaters, and a flatter slope towards the confluence.

Johnson Creek has more of a “geomorphologically” inverted condition.

Geology

Johnson Creek is a sub basin of the Willamette River, which drains the Willamette Valley. The Willamette Valley is a lowland that has accumulated a substantial thickness of sediment. The floodplain of Johnson Creek is thought to be a remnant of large glacial floods that occurred about 15,000 years ago. The ‘Missoula floods’ helped shape the Columbia River basin and the large, flat floodplain in the Lents area of the Johnson Creek watershed.

The basin-filling deposits of the Willamette Valley also include a substantial thickness of basalt lava that flowed into the region during the early stages of basin development. This lava, known as the Columbia River Basalt Group, occurs in the northern two thirds of the Willamette Valley. The basalt lava has been folded and faulted, and now forms a series of uplands that separate the Willamette Valley into a series of sediment-filled sub-basins. The basalt lava is exposed in the uplands separating the sub-basins, and lies beneath the valley-filling sediments in the intervening areas.

Soils

The Willamette Valley is an old volcanic and sedimentary seabed that has been overlaid with gravel, silt, rock and boulders brought by the Missoula Floods from Montana and Washington between 10,000 and 15,000 years ago. The most common of the volcanic type is red Jory soil, which is found above 300 feet elevation (as it had escaped the Missoula Floods deposits) and is between four and six feet deep. Anything below 300 feet elevation is primarily sedimentary-based soil.

History

Native Americans traveled and set up summer camps throughout the watershed as they fished, hunted, and foraged for seasonally available foods. Before urbanization, the Johnson Creek watershed was a diverse area of upland and wetland forests with extensive vegetative growth. As pioneers settled along the banks of Johnson Creek, large ancient trees were cut and sawmills were built. United States government land surveyors supposedly named Johnson creek after William Johnson, an 1846 pioneer who in the 1850's built a sawmill near what is now the Lents neighborhood.

Riparian vegetation was removed and the wetlands along the lower segment of the creek were filled. The middle floodplains were cleared for farming to take advantage of the fertile soil deposited by frequent floods. By the 1920s, residential areas began to replace nurseries and farms, a trend that still continues.

In 1903 the Springwater Division Line, which ran alongside much of Johnson Creek, was developed for rail service. In addition to passengers, the trains hauled farm products to Portland markets. Many communities developed along the rail line, including Sellwood, Eastmoreland, Lents, and Pleasant Valley. To encourage weekend rail use, the rail corporation developed destination parks, such as Oaks Amusement park, along the line. By 1990, the City of Portland had purchased much of the rail corridor. In the following years, Metro purchased additional portions of the line. The historic rail corridor is now the 21-mile recreational Springwater Corridor Trail that runs through the heart of the watershed, almost entirely along the creek.

One of the most significant changes in the watershed occurred in the 1930s when the Works Progress Administration (WPA) attempted to control flooding by widening, deepening, and rock-lining the creek, creating trapezoidal channel in 15 of the 26 stream miles. These actions disconnected the creek from its floodplain, degraded streambank conditions, and substantially altered Johnson Creek from its historical configurations. The actions did not, however, stop major flooding. Johnson Creek has flooded 37 times since 1942.

Salmon and trout were once plentiful in Johnson Creek, and at one time there was a small commercial fishery near SE 45th Avenue and Johnson Creek Boulevard. The last sightings of Johnson Creek "thick with salmon" range from the late 1940s to the early 1960s, although sightings of plentiful trout have been documented right up to the 1980s.

The largest flood known to date happened in 1964. Approximately 1,200 structures were flooded, and over the next several years many attempts were made to address flooding problems. Residents in the watershed were divided between those living in the floodplains and those living in the uplands. Heated debates over how flood control was to be paid for, what remedy or remedies should be implemented, and plans for reservoirs, channelization projects, and regional detention facilities sitting on the shelf.

The 1970s marked a period of residential growth in the watershed. Infill took place in the already densely urban areas. Many of the smaller farms in the upper watershed were converted to large nursery operations. The late 1980s through the 1990s brought several developmental pressures to the watershed. The activities include development on the slopes of the Boring Lava Domes, expansion of the urban growth boundary in the Kelly Creek tributary, urban renewal in Lents, and further infill of the frequently flooded areas along Johnson Creek.

Climate

The climate of the Portland area can be described as mild with seasonal variation. Part of the year our weather pattern can be described as Marine West Coast with mild wet, winters. Our summer weather, which is usually hot and dry, is closer to a Mediterranean climate pattern. The average high temperature is 63°F., average low is 47°F. There are 155 days of measurable precipitation and an average rainfall of about 44 inches.

Issues of Concern

72% of its 34,000-acre drainage area is inside the urban growth boundary

Water quality in Johnson Creek is listed as water quality limited for bacteria, summer temperature, and toxics. Commonly used pesticides and herbicides are not being detected at significant levels in Johnson Creek, although DDT and Dieldrin still linger after their banning in the 1970s.

Temperature can be dangerously high for salmonids in July, temperatures above 75° are lethal to steelhead and above 79° are lethal to salmon. Oregon DEQ has set a 64°F temperature limit for Johnson Creek.

Factors that affect WQ

- Removal of streamside vegetation
- Heated industrial discharges,
- Summer stormwater run-off, and shallow detentions of water may elevate stream temperature.
- High temperature combined with animal waste and fertilizer runoff can also deprive the water of dissolved oxygen, which can impair fish migration.

Water Quantity

Stormwater Run-off collects pollutants and sediments contributed by various upland activities. These pollutants and sediments affect the water quality of Johnson Creek.

Hydrology

Johnson Creek's stream channel, flow patterns, and flood plain capacity have been significantly altered by development. Flooding in Johnson Creek results from direct surface runoff and increased ground-water discharge and poses problems in residential, commercial, and public areas. Commercial and residential development in the basin has likely affected both the high-flow and low-flow hydrologic conditions in the basin. Fewer permeable surfaces available for stormwater infiltration, the more quickly stormwater reaches the stream channel – hence increasing the likelihood of flooding.

Instream Habitat

Channelization of Johnson Creek has significantly impacted the quality of instream physical habitat. Because the historical floodplain is disconnected or minimally connected to the creek through much of its length, flood flows cannot spread out and soak into the floodplain. Rather, flood flows are directed and concentrated into the main channel, increasing stream bed scour and degrading instream habitat for fish and other aquatic organisms. Floodplain fill and disconnection also eliminated off channel habitat along the mainstem. Off-channel habitat is extremely rare, and is a major component of current restoration projects like Kelly Creek. Johnson Creek has extremely low volumes of instream wood particularly large wood necessary for pool formation. In stream large wood is lacking because there are few large, mature trees along the stream banks. What large trees that do fall into the creek are often removed to prevent potential damage and flooding.

Fish

Fish communities in Johnson Creek include both native and non-native species. Most of the native species present are thought to be tolerant of warm water and disturbed conditions. These include red-sided shiners, sculpin, suckers, and speckled dace. Historically large populations of salmon inhabited Johnson Creek. Numbers declined dramatically once urbanization began and after the channelization work was completed.

Johnson Creek is one of the region's last free-flowing urban streams and has received Federal listing for native fish. High winter and spring flows can flush out spawning gravel, egg nests, and protective woody debris. Low summer flows force salmon into pools and intermittent tributaries that may dry up and strand them. Winter steelhead trout and Chinook Salmon populations that travel through the lower Columbia River basin have been listed as "threatened" species, coho and sea-run cutthroat trout have been proposed for listing.

Sensitive species

Sensitive species known to reside in the riparian areas of Johnson Creek include three salamander species (long toed, northwestern and Columbia), two frog species, and one toad species. Painted turtles have been identified in the upper watershed (east of 162nd Street). Other sensitive species have been sighted in the following specific areas: salamanders at Kelley Creek; great horned owls, red-legged frogs, hawks, and coyotes and Tall bugbane at Powell Butte.

Macroinvertebrates

Benthic macroinvertebrates are an important source of food for fish and other aquatic organisms. A study conducted by Portland State University in 1999 sampled sites monthly for diatoms, macroinvertebrates, and water chemistry. Benthic communities were found to be degraded in comparison to regional reference creeks within the same ecoregion.

Wildlife

Johnson Creek acts as a wildlife corridor for the passage of species not normally observed in large cities, including deer, coyote, bear, cougar, and many woodland and meadow birds. A large or exhaustive database of information is not available on wildlife resources and their habitat throughout the Johnson Creek watershed. It is believed that the diversity of wildlife species in the watershed has been significantly reduced. Large mammals were once common, such as black bear, bobcat, cougar, wolf, fox, elk, and coyote. Birds are the most abundant wildlife forms living in urban and rural areas within the watershed and Pileated woodpeckers have been observed in the Boring lava Domes forest.

Demographics

Population

Since the days of William Johnson, many, many people have built homes and businesses in the Johnson Creek watershed. In fact, now there are over 170,000 people that live in the Johnson Creek watershed. That means that about 3,150 people live in each square mile of this watershed! In the lower and middle reaches of the watershed, the land has been developed into homes and businesses, but in the upper watershed there are still many farms and farmhouses. Even though there are some farms in the watershed, most people classify Johnson Creek as an urban stream.

Land Use

72% lies within the urban growth boundary
Zoning by Percent

Single Family Residential	57%
Rural	8%
Multi-Family Res.	12%
Parks & Open Space	13%
Industrial	(0%)
Commercial	10%

Agricultural

Cultivated crops or pastures	50%
Tree and ornamental nurseries	29%
Cultivate Cane Crops	2%
Not classified	19%

Vegetation

The Willamette Valley ecoregion includes oak woodlands, grasslands (including oak savanna), wetlands (including wet prairies), riparian, and aquatic habitats. Historical accounts indicate that prior to European settlement, much of the Willamette Valley was covered by native grasses and forbs. The Calapooia people regularly set fires to improve hunting and travel. The fires helped maintain the valley's mosaic of grasslands, oak savannas, wet prairies and other open habitats. Since the 1850's, much of the Willamette Valley ecoregion has been altered by development (agricultural or urban, particularly affecting oak woodlands, oak savanna, grassland, riverine and wetland habitats.

The Johnson Creek watershed contains a mosaic of vegetation types, including agricultural lands, urban and suburban landscapes, upland forests, riparian woodlands, and wetlands. Because of extensive logging and clearing, remnants of predevelopment vegetation are rare. About 57 percent of the watershed is currently vegetated, including grass, trees, blackberries and all other types of vegetation.

Uplands

The forest that historically covered the Johnson Creek watershed ridges and lowlands was substantially cleared in the early 1900s for agriculture, timber production, and urban development. In the mid and late 20th century some areas such as the buttes and ridges in the south central and eastern part of the basin were left to regenerate into a second growth forest. Forest clearing of second growth has increased dramatically in recent years as housing development expanded from the lowlands onto the ridges and hillside slopes.

Wetlands

Over time, development and associated changes to the landscape have highly impacted the wetlands within the Johnson Creek Watershed. The remaining wetlands are extremely diverse. They range in size from the 19-acre Beggars Tick marsh in the Lents area, to many smaller emergent wetlands in the basin of less than a tenth of an acre. Many wetlands in the basin have good connectivity with undeveloped open space, upland habitats, and the Johnson Creek riparian corridor. Several significant areas of wildlife breeding and nesting are found in wetlands within the basin with dense breeding populations of amphibians, including red-legged frogs.

Riparian Areas

Channelization and development have greatly reduced riparian vegetation throughout most of the Johnson Creek Watershed. In most of the watershed, riparian vegetation is narrow, minimal, or lacking. Thirty-four percent of the watershed has little or no riparian vegetation present, and an additional 32 percent has riparian vegetation less than 100 feet wide. The riparian corridors are also highly fragmented by frequent road crossings. Generally, vegetation in riparian areas is dominated by blackberry or young native plants and lacks large mature trees. However, riparian area vegetation quality is improving. Local agencies and citizen groups have ramped up efforts to remove invasive and non-native plants and replant natives, creating more canopy closure.

Invasive Non-native Species

Invasive species currently are considered to be one of the primary causes of species becoming threatened and endangered, second only to habitat conversion.