



Our mission is to promote restoration and stewardship of a healthy Johnson Creek Watershed through sound science and community engagement.



BRUCE MACGREGOR

Johnson Creek Watershed Council 2015 TO 2025 ACTION PLAN

JOHNSON CREEK flows west for 26 miles from the agricultural foothills of Mount Hood near Boring, to where it enters the Willamette River just upstream of Portland. Elevations range from near sea level to 1,100 feet. Numerous springs and 50 inches of annual rainfall provide streamflow to the creek and its tributaries, which flow through parts of five cities and two counties. The creek provides water for agriculture and a picturesque setting for recreation, supporting both people and natural resources.

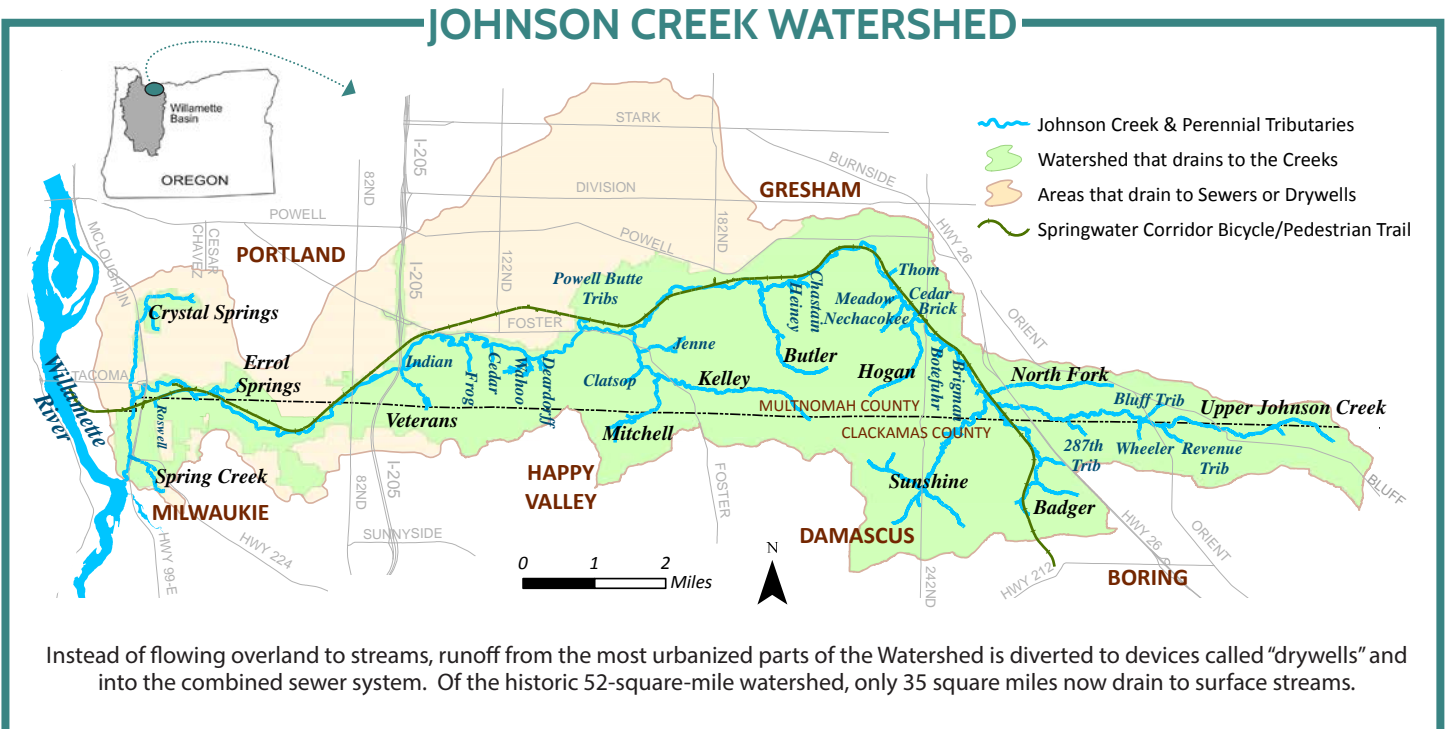
HISTORICALLY, ancestors of the Confederated Tribes of the Grand Ronde lived in this area. In the 1800's, immigrants settled here,

building several mill dams on the creek by 1852 and a railway by 1890. In the 1930's, the lower 15 miles of Johnson Creek were channelized and lined with rock, which cut off floodplains, eliminated gravel bars, and destroyed streamside forests.

OVER THE PAST TWENTY YEARS, major efforts have begun reconnecting Johnson Creek to its floodplain and protecting and restoring important fish and wildlife habitat. Hundreds of streamside acres have been reforested with native shrubs and trees. Over 4,600 acres of parks and natural areas have been established in the watershed. A 21-mile bicycle and pedestrian path now follows the

creek for much of its length. Called "Junk Creek" not long ago, now Johnson Creek is one of the few urban streams in our region where salmon spawn, year after year.

LOOKING FORWARD, climate change and development will compound the impacts of summer droughts, heat-waves, and higher-intensity rainstorms on aquatic life. But there is hope – modeling has shown that large-scale floodplain restoration and habitat enhancement projects may counteract many of these impacts on salmon and trout. The long-term solution is a shared positive vision and active community stewardship for a healthy Johnson Creek.



This Plan summarizes the best available information for fish, wildlife, and natural conditions and sets our course for the next 10 years.

2015 WHY A NEW PLAN?

Together, we've accomplished the majority of our previous Action Plan's recommendations¹. Hundreds of projects have been implemented throughout the watershed over the past decade² by the Council and partner organizations. Projects ranged from removing fish passage barriers and improving in-stream fish habitat to reconstructing off-channel flood storage, enhancing wetlands, and re-establishing native riparian forests. While continuing to maintain these investments, it's time to embark on a new set of priority projects.

Stronger relationships with our partners have led to greater collaboration and integration of our planning and monitoring efforts. Long-term monitoring and recovery of a watershed that is managed by five cities, two counties, Metro, and multiple state and federal agencies, requires intense, basin-wide coordination. We also work closely with private landowners, businesses, academics, and other non-profits and "friends-of" groups throughout the Watershed.

More people volunteer and connect with the Council than ever before. With a full-time Volunteer and Outreach Coordinator, electronic and paper communications reach thousands of people monthly. In 2014, over 1,300 people volunteered their time to improve the Watershed through weed control, planting parties, garbage clean-ups, citizen science, and other fun and educational events.

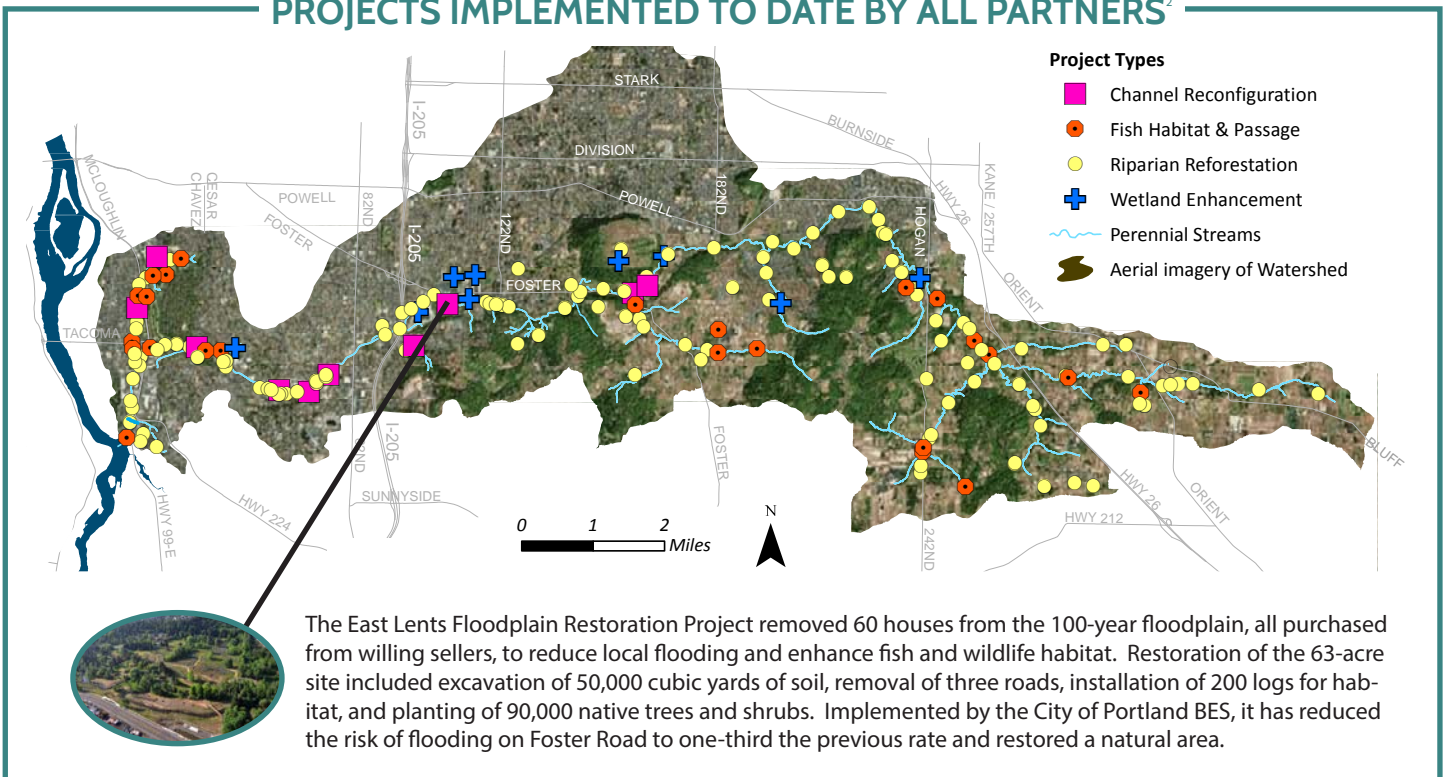
Watershed science and monitoring have improved our understanding of how best to restore Johnson Creek. New information includes the extent of trout and salmon in the upper Watershed³ and which road crossings are most important to fix to open migration access⁴. We have mapped where streamside shade is most needed to cool the Creek, and we have more realistic goals for reducing toxics and sediment^{5,6}. Collaborative monitoring has identified cooler, healthier refugia in the headwaters⁷, which correspond with high value wildlife habitat for conservation.

New land use planning and policies protect riparian areas, trees, and water quality. Metro's Title 3 and Title 13 zoning regulations now protect streams and wetlands from development. With more than a million more people coming to the Metro region in the next 50 years, new policies will be needed to protect floodplains and prevent further pollution and hydro-modifications.

Climate change is already bringing warmer, drier summers and higher-intensity rainstorms, which negatively affect aquatic life. Increased population in the Portland area will exacerbate these impacts. Stewardship and restoring actions will increase ecosystem resilience to climate change and ongoing development⁸.

Celebrating our 20th Anniversary in 2015, the Council has matured as an organization. While our 2012 Strategic Plan provides organizational and fundraising objectives, this Action Plan will guide programs activities going forward.

PROJECTS IMPLEMENTED TO DATE BY ALL PARTNERS²



1 JCWC. 2002. Johnson Creek Watershed Action Plan; An Adaptive Approach. 2 For more project details, see jwc.conservancyregistry.org. 3 Wild Fish Conservancy. 2012. Fish Species Composition, Distribution, and Biotic Integrity in Johnson Creek, a Tributary to the Willamette River in Multnomah County, Oregon. Prepared for Multnomah County Water Quality Program. 4 JCWC. 2015. Final Report; Johnson Creek Watershed Fish Passage Assessment & Project Prioritization; Ted Labbe and Jamie Glasgow. 2012. Multnomah County Fish Passage Assessment. Prepared for Multnomah County Water Quality Program. 5 Oregon Department of Environmental Quality. 2004. Johnson Creek Temperature TMDL as part of the Lower Willamette Subbasin TMDL; Brittany Sahatjian. 2012. Prioritizing Riparian Restoration Efforts in the Johnson Creek Watershed through Effective Shade Modeling. Portland State University MEM Thesis. 6 Oregon Department of Environmental Quality. 2004. Johnson Creek Toxics and Bacteria TMDLs as part of the Lower Willamette Subbasin TMDL; Stonewall, A.J. and H.M. Bragg. 2011. "Suspended-Sediment Budget for the Johnson Creek Basin, Oregon, Water Years 2007-2010." Draft Scientific Investigations Report. 7 James MacConaghie, Bruce Newton, and Robin Jenkinson. 2015. 2015 Johnson Creek Watershed Assessment. 8 ICF International. 2011. Johnson Creek salmonid potential with future urban development, climate change and restoration: 2009 to the 2040's. Prepared for City of Portland BES.

2025 VISION

THIS ACTION PLAN continues the good work of thousands of people over the past twenty years¹ and synthesizes the best available information for people, fish and wildlife, and natural conditions in the Johnson Creek Watershed. With continued support from our partners^{2,3}, this plan will guide the Johnson Creek Watershed Council for the next ten years.



PAGES 4-5

PEOPLE

Johnson Creek becomes a regional icon for how people, fish, and wildlife can thrive together.

KYUNG LEE



PAGES 6-7

FISH

Native fish species thrive and anadromous salmon and trout return in greater numbers each year.



PAGES 8-9

RIPARIAN FORESTS

Johnson Creek and tributaries are green corridors of cool streams with connected tree canopy that extend to several forested upland areas.



PAGES 10-11

WATER QUALITY

Pollution is addressed, the creek is cleaner, and it's safer for children to swim and wade in Johnson Creek.



PAGES 12-13

WILDLIFE

Healthy natural areas are protected, and habitat is enhanced through restoration projects.

JOHN HAN



PAGES 14-15

WATERSHED SCIENCE

Collaborative watershed science informs our actions to improve watershed conditions.

¹ Johnson Creek State of the Watershed (JCWC, 2012); Johnson Creek Acquisition Plan, Investing in a Natural Area Network (Johnson Creek Partnership, 2012); Johnson Creek Watershed Characterization (Portland BES, 2005); Johnson Creek Watershed Action Plan, An Adaptive Approach (JCWC, 2002); Johnson Creek Restoration Plan (Portland BES, 2001); Salmon Restoration in an Urban Watershed: Johnson Creek, Oregon (Portland Multnomah Progress Board, 2000); Johnson Creek Resources Management Plan (JCWC, 1995). ² The Johnson Creek Inter-jurisdictional Committee (IJC) provided technical assistance in the development of this report. The IJC includes representatives from the City of Portland, City of Gresham, City of Milwaukie, City of Damascus, Multnomah County, Clackamas County, Metro, East Multnomah Soil and Water Conservation District, Clackamas County Soil and Water Conservation District, Oregon Department of Environmental Quality, Oregon Department of Agriculture, U.S. Geological Survey, and the Johnson Creek Watershed Council. ³ The development of this plan was funded by the Meyer Memorial Trust and Clackamas WES.



LONG-TERM WATERSHED HEALTH will not be sustained unless the community is engaged in stewardship and advocacy for their streams. By working closely with streamside landowners and partner organizations, the Council will continue to build relationships and a community around Johnson Creek.

We aim to broaden and deepen the awareness of and appreciation for the ecological, cultural, economic, and recreational value of the Johnson Creek Watershed by local residents and in the region at large. We believe that thriving natural areas sustain and enrich our neighborhoods and that people have a responsibility to protect and steward the natural world, not solely for their needs and desires, but for its own inherent value.

When we work together, we can accomplish more. By acting with integrity and listening respectfully to all interests and perspectives, we can create lasting positive change in the Johnson Creek Watershed.



ACTIONS

VOLUNTEERS: Provide excellent volunteer experiences for a broad diversity of people and increase the numbers and level of commitment of volunteers.

OUTREACH: Continue to share watershed information via website, email, social media, and printed materials and by tabling and participating in partner events. Continue producing outreach materials in English, Spanish, and Russian.

CITIZEN SCIENCE: Provide more opportunities to engage volunteers in projects that deepen our collective understanding of Johnson Creek Watershed ecology.

ENVIRONMENTAL EDUCATION: Integrate service-learning into all projects and support partners' educational work through communication, promotion, and volunteer activities.

SURVEY to better understand residents and streamside landowner perspectives to guide our outreach strategy.

RELATIONSHIPS: Maintain and expand relationships with streamside landowners and potential partner organizations.

SIGNAGE: Enhance interpretive opportunities along the Springwater Trail and Johnson Creek, maintain Watershed location road signage, and improve office signage.

JCWC OFFICE provides Johnson Creek and natural science learning resources, demonstration projects, as well as meeting space for partners, students, and community.

SPRINGTIME WATERSHED WIDE EVENT Seventeen Years and Running

THE JOHNSON CREEK WATERSHED WIDE EVENT typically draws 400 volunteers for one Saturday morning to improve the watershed at 10 or more project sites. Volunteers of all ages remove invasive weeds and plant native trees and shrubs at priority natural areas throughout the Watershed, and then finish with a big group lunch.

The event was created by the Council's founders in 1998, starting with just three locations. Each year the event continues to grow thanks to partner participation and community concern and love for the Creek.



BRUCE MACGREGOR

IT TAKES A VILLAGE TO RESTORE THE CREEK Friends Groups, Non-Profits, and Stewards

THE COUNCIL WORKS closely with other non-profits including Friends of Trees, SOLVE, and Depave on projects in the basin. We also work with place-based stewards, including Leach Botanical Gardens, Zenger Farms, and Reed College.



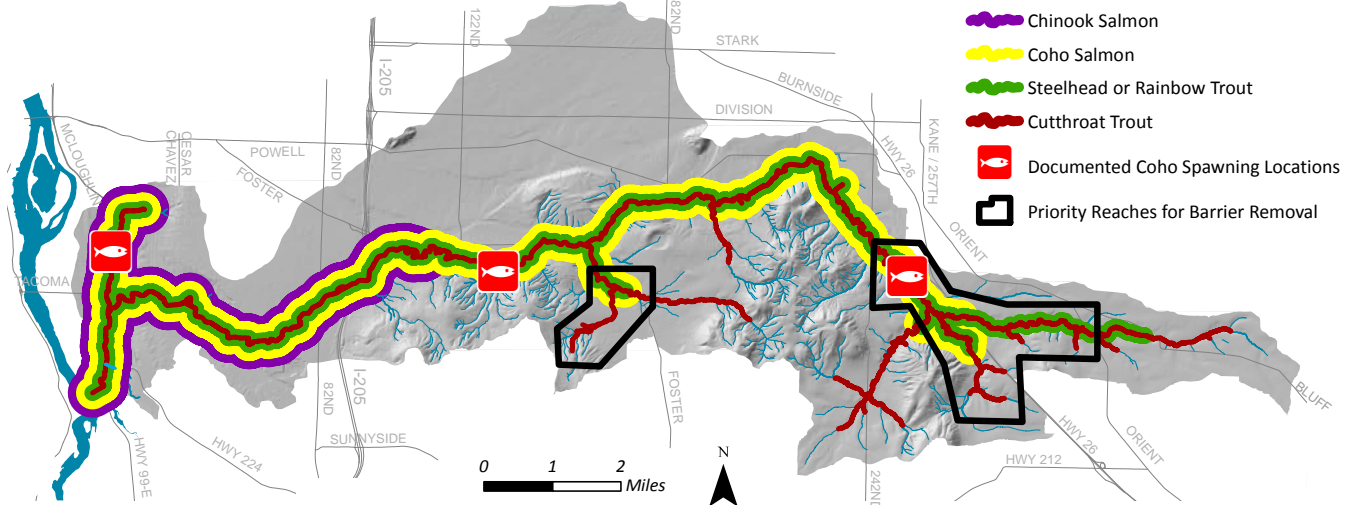
Several groups have formed around specific Portland Parks, including Friends of Tideman Johnson and Friends of Errol Heights. The Council helps recruit for Portland Parks & Recreation's Park Stewards program, where volunteers commit to a year of stewardship at a park. Other groups focus on a trail, such as the Springwater Corridor crew with Ed Kerns, or a specific subwatershed, such as the Crystal Springs Partnership.



The Council aims to connect with and actively engage people from all walks of life and from all parts of the watershed in caring for Johnson Creek.

2015 FISH

SALMON & TROUT DISTRIBUTION



SALMON AND TROUT still swim in Johnson Creek and tributaries, though fewer than historically.

In terms of salmon, Johnson Creek is essentially a Coho ecosystem. Coho Salmon thrive in low-gradient streams with complex habitat including side channels, active floodplains, log jams, and beaver ponds. When Coho are thriving, it's likely that the entire ecosystem is functioning to support a diversity of native creatures and plants.

Each year since 2010, a few wild Coho salmon have been documented spawning over 15 miles up Johnson Creek near Gresham. In fact, recent fish surveys have found salmon and trout further

upstream than previously documented by the Oregon Department of Fish and Wildlife¹.

In 2011-2012, native fish species were found in nearly every tributary surveyed, even in the small, intermittent streams. Native fish species in Johnson Creek include Reticulate Sculpin, Brook and Pacific Lamprey, Redside Shiner, Speckled Dace, Largescale Suckers, and Signal Crayfish. Fewer than 1% of fish surveyed were non-native species.

However, habitat has been damaged throughout the watershed, and the resilience of native species has been tested. Access to good habitat is essential so that native fish can survive into the future.

CRYSTAL SPRINGS FISH PASSAGE PROJECTS

Fish-Friendlier Culverts & Bridges



MICHELLE HELMS

NINE CITY OF PORTLAND CULVERTS on Crystal Springs Creek between SE 28th Avenue and the creek's confluence with Johnson Creek inhibited fish from reaching spawning and rearing habitat. Starting in 2010, seven of these were replaced by Portland BES with fish-friendly culverts and bridges, with the last two scheduled for 2016, opening up nearly three miles of habitat for threatened native fish species.

ENGINEERED LOG JAMS IN UPPER JOHNSON CREEK

Enhancing Aquatic Habitat



BETWEEN SE PALMBLAD AND 262ND, just east of Gresham, Metro enhanced salmon habitat in Johnson Creek by installing 17 instream log jams in 2014. Each log jam consists of several Douglas fir logs and is designed to provide cover and shelter for native fish, in particular trout and salmon. Metro also planted thousands more native trees and shrubs along the creek, enhanced off-channel habitat, constructed two side-channels, and added over 25 floodplain logs.

¹ Wild Fish Conservancy. 2012. Fish Species Composition, Distribution, and Biotic Integrity in Johnson Creek, a Tributary to the Willamette River in Multnomah County, Oregon. Prepared for Multnomah County Water Quality Program.

2025 OPEN MIGRATION

CULVERTS, deteriorating bridges, and other barriers in streams block the movement of fish up Johnson Creek and tributaries. A recent assessment showed that 52% of perennial streams in Johnson Creek with suitable habitat are blocked to salmon and trout (34 miles of the potential total of 66 miles).

Of the 273 stream crossings assessed for fish passage, we found 202 or 74% of them to be fish passage barriers. These included both public (129/165) and privately-owned structures (73/108), where permission had been granted.

In 2014, these barriers were prioritized for restoration using an optimization model based on maximizing habitat gain for least cost. Using this tool, fifteen projects were identified that cumulatively would open access to 7 miles of habitat in perennial tributaries. Collaborating with jurisdictional partners, we will address three additional culverts to open two more miles of Mitchell Creek to salmon and trout.

Over the next several years, Portland, Metro, East Multnomah SWCD and Multnomah County plan to replace additional barrier culverts on tributaries to Johnson Creek, opening even more habitat to trout and salmon.

This type of project often yields immediate results, with salmon observed upstream of former barriers within a few years.

ACTIONS

BARRIER REMOVAL: Coordinate with partners and private landowners to remove 18 highest priority fish passage barriers, opening salmon access to 9 miles of habitat.

SHARE INFORMATION with landowners, the public, and partners about the extent of salmon and trout and project needs.

AQUATIC HABITAT: Support partner efforts to enhance aquatic habitat and floodplains.

SCIENCE: Continue autumn Coho spawning surveys with volunteers. Learn more about Lamprey distribution and passage barriers.

ASSESS additional private culverts as permission is granted.

BROOK LAMPREY IN JOHNSON CREEK



CAZ ZIVATANSKAS

REPLACING BARRIER CULVERTS UNDER THE SPRINGWATER CORRIDOR TRAIL

Badger Creek



SALMON MIGRATION up six Johnson Creek tributaries is blocked by culverts under the Springwater Corridor Trail. First-ranked among these is the culvert located where Badger Creek flows under the Trail near SE Telford and Rugg Roads. It is a complete barrier to fish passage and is in very poor condition due to burial, rust, and clogging. Furthermore, juvenile and adult coho salmon have been recently documented in this area.

Portland Parks & Recreation (landowner) is supportive of replacing this structure with a better culvert or bridge to allow for year-round fish passage and other ecological processes.

PROVIDING YEAR-ROUND FISH PASSAGE & ENHANCING HABITAT

Willamette River Confluence



IN 2011, private landowners, the City of Milwaukie, and JCWC collaborated to construct engineered log jams and a riffle at the confluence of Johnson Creek with the Willamette River. One hundred and fifty logs were installed to provide cover and shelter for salmon and trout and to allow year-round fish passage over an exposed sewer pipe.

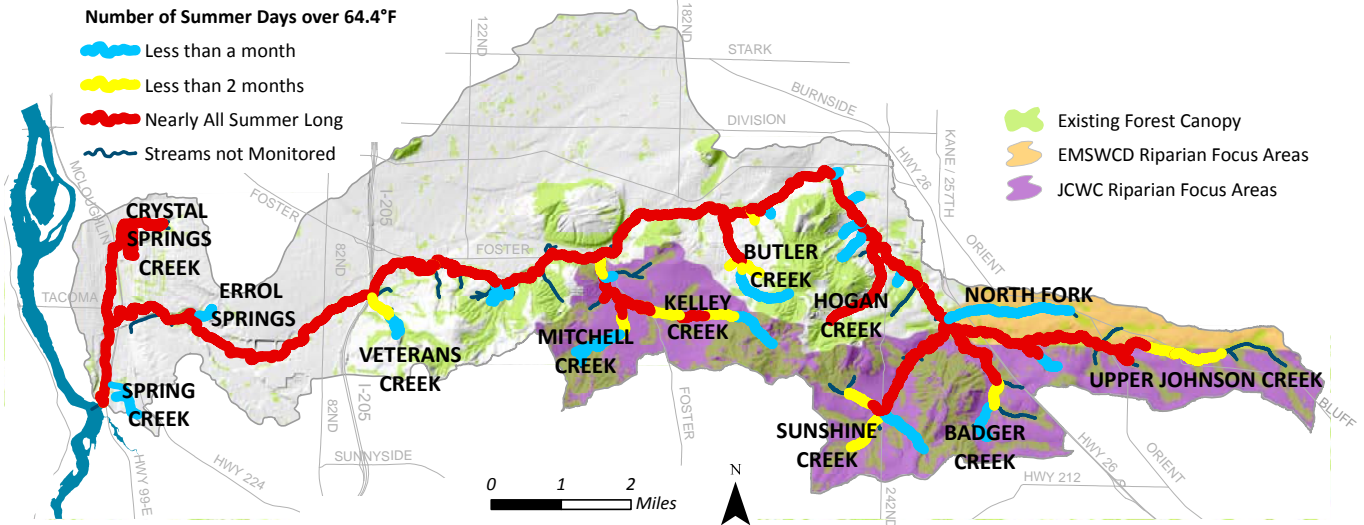
Since then, Council volunteers have replanted the six-acre site with native forest species, removed garbage, and pulled weeds. An interpretive overlook was constructed on the south bluff in Milwaukie Riverfront Park, with signs describing the ecological benefits of log jams and streamside forests and the site's history.



Culvert replacement and removal projects that restore fish passage will be the Council's primary focus for instream habitat restoration over the next decade.

2015 RIPARIAN FORESTS

STREAM TEMPERATURES¹ & FOCUS AREAS



RIPARIAN FORESTS PROVIDE MYRIAD BENEFITS, including habitat, erosion protection, and shade to keep water cool. Ample, cool streamflow is essential for fish and wildlife. Warm water carries less dissolved oxygen, and direct sunlight can cause algal blooms.

During the summertime, Johnson Creek is often hotter than state water quality standards for rearing salmon and trout (64.4°F). Stream temperature monitoring from 2009 to 2014 indicates violations of the temperature standard in most of the streams in the watershed, even high up in the “headwaters” reaches near Boring, and in Damascus, Gresham and Happy Valley. The lower mainstem, in Portland and Milwaukie, is consistently above the standard. In fact, in July 2009, it reached 80°F.

Historically, streams were kept cool by forests that shaded the stream channels. But in 2002, the average effective shade over mainstem Johnson Creek was just under 40%².

Analysis has shown that to keep Johnson Creek cool enough for trout and salmon to thrive in the future, an average of 80% shade over the stream channel will be required². To meet this goal, trees must be planted along streambanks everywhere possible. Even a narrow creekside forest buffer in a backyard makes a difference.

Since it can take many years for trees to grow large enough to completely shade the creek, it will be a long time before we detect a stream temperature response to planting efforts. In the meantime, fish may find refuge in small, shaded tributaries and areas with groundwater springs.

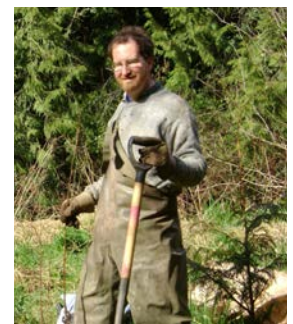
TAKING AN “IN-LINE” POND OFFLINE Kelley Creek Bradshaw Project

THE BRADSHAWS own a Christmas tree farm along Kelley Creek. Their six-foot dam blocked fish passage and their 200-by-85-foot pond was a source of heat to the creek. The Bradshaws wanted to address these issues and retain a pond feature. In 2007, the Council helped them remove the dam, restore an open 400-foot stream channel, and build a separate, “offline” pond.



RURAL LANDOWNERS PLANT TREES CreekCare and StreamCare

IN RURAL AREAS of upper Johnson Creek, over 80 private landowners are working with the East Multnomah and Clackamas County Soil and Water Conservation Districts (SWCD's) and the Council to restore riparian forests. Collectively since 2009, we've treated 122 acres for weeds and planted 7.3 miles of new streamside forests with 105,000 native trees and shrubs.



¹ Summertime temperature data provided by Gresham, Portland BES, Multnomah County, East Multnomah SWCD and the JCWC. ² Effective Shade Analysis was conducted by Oregon Department of Environmental Quality for the Johnson Creek Temperature TMDL as part of the Lower Willamette Subbasin TMDL (2004). ³ Noah Jenkins, Robin Jenkinson, and Jill Bonanno. 2012. Riparian Reforestation Strategy. JCWC. ⁴ Brittany Sahatjian. 2012. Prioritizing Riparian Restoration Efforts in the Johnson Creek Watershed through Effective Shade Modeling. Portland State University MEM Thesis. ⁵ Dalton, M.M., Mote, P.W., & Snover, A.K. (2013). Climate Change in the Northwest: Implications for our Landscapes, Waters and Communities. Washington, DC: Island Press. ⁶ Vynne, Stacy, Steve Adams, Roger Hamilton, and Bob Doppelt. 2011. Building Climate Resiliency in the Lower Willamette Region of Western Oregon. Created by The Resource Innovation Group's Climate Leadership Initiative, Eugene, Oregon.

2025 COOLER STREAMS

THE COUNCIL'S RIPARIAN REFORESTATION STRATEGY prioritizes streamside areas where new plantings would have the greatest impact on stream temperatures, would expand existing forests, and would enhance salmon and trout habitat³. Focus areas and priority taxlots were identified based on an analysis of aerial photos, ecological conditions, and HeatSource model results⁴.

Because it is difficult to cool water once it is heated, the Council and partner Soil and Water Conservation Districts (SWCD's) are focusing our reforestation efforts on the upper watershed. Keeping these "headwaters" streams cool will lower stream temperatures throughout the rest of Johnson Creek; moreover, these streams are small enough to be shaded by young trees (fast-growing species, such as willows and red alder, can shade streams of this size in 5-10 years or less).

The Council will focus on Badger and Sunshine Creeks (with help from Clackamas County SWCD), as well as Kelley Creek. East Multnomah SWCD is providing reforestation services along North Fork and parts of Upper Johnson Creek. In all, 110 individual taxlots are identified as priorities in the focus areas (54 in Multnomah County, 56 in Clackamas County). The Council will continue to conduct outreach to private landowners in these areas and host project tours to encourage others to enroll in voluntary streamside reforestation. Where other strong partnerships exist outside of these focus areas, the Council's outreach will also be guided by the Reforestation Strategy.

ACTIONS

RIPARIAN REFORESTATION: continue implementing Riparian Reforestation Strategy with targeted outreach. Plant 30 acres in the focus areas by 2020, and a total of 100 acres watershed-wide by 2025.

IN-LINE PONDS: analyze which ponds could make the greatest difference for salmonid-bearing tributaries; conduct landowner outreach.

THERMAL REFUGIA: better understand groundwater (gaining and losing reaches) and support partner efforts to conserve upwelling and cooler water locations.

PRESERVE EXISTING RIPARIAN FORESTS: increase Council conservation efforts and support partner acquisitions and policies.

SCIENCE: develop a climate change resilience indicator so we can track improvements over time. Continue to monitor summertime stream temperatures. Assess limiting factors for achieving cool waters reach by reach.

EVALUATE THE SUCCESS of the Council's Riparian Reforestation Strategy.

CLIMATE CHANGE PREDICTIONS Building Resilience is Essential

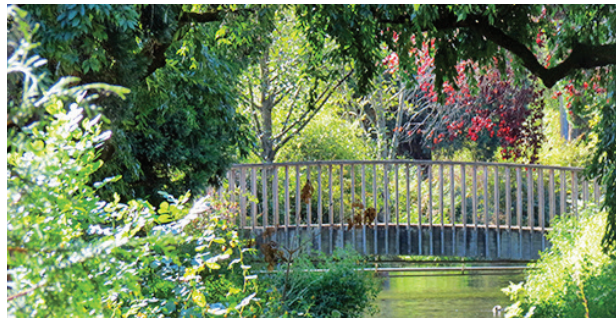
BY 2100, our area may experience average annual increases in air temperature of 2°F to 8.5°F⁵ (10 to 15°F warmer in summer⁶). More intense rainstorms during wetter winters will lead to higher stream runoff events. Drier summers will reduce summer streamflows.



This will lead to reduced water quality, flashier floods, and warmer, drier summers affecting the ranges of plant and animal species, possibly favoring invasive and non-native species.

Although the climatic impacts will be significant, the Lower Willamette will be less affected than other places. A possible consequence will be that this area may become a haven for climate refugees from other regions of the country. Accommodating population growth and development may be just as difficult as managing the impacts of temperature increases, extreme weather events, and water supply constraints resulting from reduced snowpack.

WESTMORELAND POND REMOVAL Crystal Springs is even Cooler



EVEN THOUGH Crystal Springs is spring-fed, it still exceeds temperature standards due to in-line ponds. In 2013, Portland and partners replaced the old duck pond in Westmoreland Park with a more natural stream channel with logs and riffles for fish habitat.

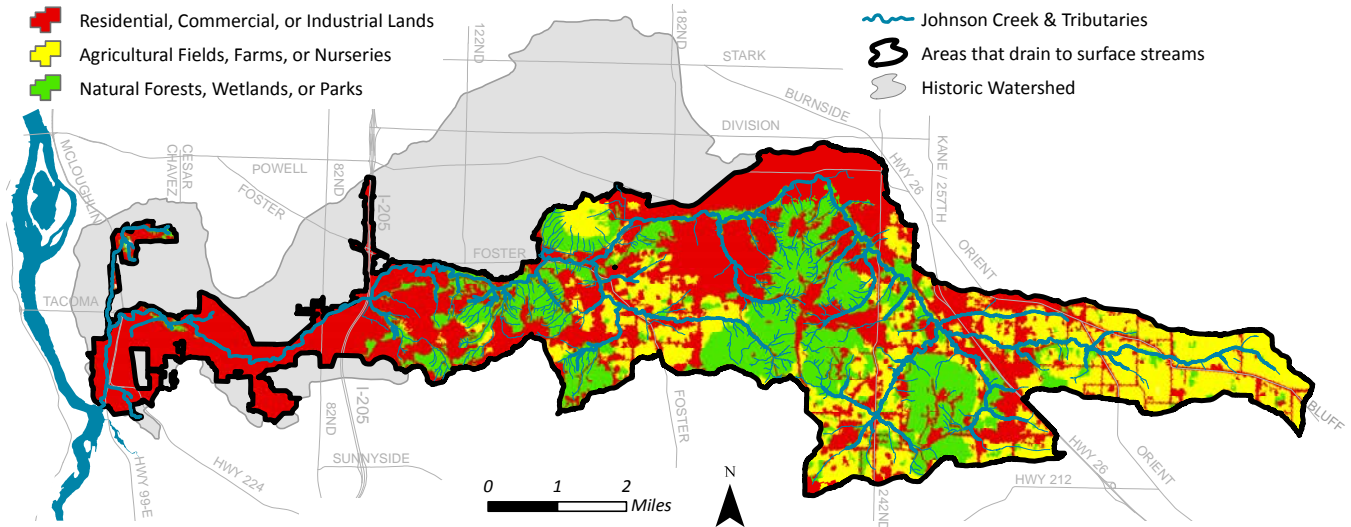
The project included a new boardwalk and a nature-play area for children, and the entire park is now Salmon-Safe Certified. One year later, stream temperatures showed a 3°C reduction downstream of the project, just in time for a banner year for Coho Salmon returns in 2014.



Because it is difficult to cool water down once it is heated, the Council is focusing our efforts on the upper watershed.

2015 WATER QUALITY

SURFACE DRAINAGE & LAND USE³



RAINFALL ON THE LAND becomes runoff and stormwater, which carries pollutants to the streams. In both rural and urban areas, water pollution harms animal and plant life. Some pollutants are water-soluble, while others attach to soil, and others are taken up by living organisms, such as fish. Pesticides and herbicides can be dangerous to aquatic life.

Because stormwater in the most urban, northern portions of the watershed is directed to the combined sewers or drywells, the current surface drainage area is only 35 square miles out of the 52-square mile historic watershed. This surface drainage land-

scape consists of 50% developed lands, 23% agricultural, and 27% natural areas.

Water quality in Johnson Creek is closely related to storm events. Rainstorms mobilize heavy metals, oils, and dirt and carry it to the creeks. In Johnson Creek, over 99% of the sediment is transported during the highest 50% of the flows, which is why it resembles chocolate milk after storm events¹. Because many pollutants attach to soil particles, it's possible to reduce levels of these contaminants by preventing erosion and keeping soil out of the creek².

NEW SEWERS IN MILWAUKIE

Making Johnson Creek Safer To Play In

JOHNSON CREEK does not meet state health standards for "contact recreation" because of high levels of *E. coli* bacteria, which come from the poop of warm-blooded creatures, including humans.



BRUCE MACGREGOR

A study conducted in 2012 found that human fecal contamination in dry months is limited to just a few sites in Johnson Creek, including just downstream of an unsewered area at SE 45th, immediately upstream of Tideman-Johnson Park.

In 2011, Clackamas County Water Environment Services completed a new sanitary sewer collection system to serve nearly 1,000 customers in the Milwaukie area. As people connect to this system and retire their old septic tanks and cesspits, bacteria input to Johnson Creek will decline.

ANNUAL GARBAGE CLEAN-UP

Tons Removed Each Summer

RAINSTORMS AND FLOODS carry garbage into the creek. Each August for the past seven years, hundreds of volunteers have pulled trash out of over five miles of Johnson Creek. The numbers of tires pulled from the creek each year has decreased as well as the overall tonnage of trash. Eight years ago, seven tons was removed, now it's down to about 3.5 annually.



BRUCE MACGREGOR

A collaboration between the Council, the Overland Park Coalition and Green Lents, the event ends with a large BBQ lunch where prizes are awarded for the most unique finds—winners have included a ceremonial mask and Yiddish flashcards.

¹ Stonewall, A.J. and H.M. Bragg. 2011. "Suspended-Sediment Budget for the Johnson Creek Basin, Oregon, Water Years 2007-2010." Draft Scientific Investigations Report

² DDT and Dieldrin information from the "Johnson Creek Legacy Pesticide Study 2003-2005," conducted by the Johnson Creek Inter-jurisdictional Committee.

³ National Land Cover Database, 2006.

2025 CLEANER WATER

DEVELOPMENT DISRUPTS the natural hydrologic cycle because impervious surfaces like concrete and rooftops shed rainfall quickly instead of allowing it to soak into the ground. Stormwater runoff can carry dirt, oil, and other toxics directly to the creek. Without stormwater management, these conditions erode stream channels, prevent groundwater recharge, and pollute the creek.

Cities, Counties and other municipal organizations manage public stormwater conveyance pipes and treatment systems. However, private and commercial properties may need assistance to increase infiltration and reduce flow and pollutant loads to streams.



GARBAGE CLEAN-UP

ACTIONS

MAP surface-water connected areas and stormwater infrastructure at the watershed-scale.

IDENTIFY portions of the watershed that are high priority for private property projects to address stormwater impacts, in partnership with jurisdictions, conservation districts, and Depave.

REACH OUT to commercial, private, industrial, church and school property-owners to promote voluntary pollution and stormflow reduction projects. Share information about relevant incentive and technical assistance programs.

CONSTRUCT DEMONSTRATION PROJECT(S) on commercial, industrial, church, or school properties.

CONTINUE PROMOTING CONSERVATION DISTRICT training events for rain gardens and native landscapes. Promote street tree planting for urban canopy and stormwater control.

BACTERIA: Support partner efforts to encourage sewer hook-ups where available (e.g., send thank-you notes to those who have connected).

TOXIC WASTE COLLECTION with Clackamas County SWCD, Metro, and others to avoid toxic inputs to streams.

HUNDREDS OF RAIN GARDENS Celebrate Oregon Raindrops in Your Yard



A **RAIN GARDEN** is a sunken area that captures runoff from hard surfaces like rooftops and driveways, allowing it to soak back into the ground naturally. Native plants filter pollution, keeping it out of our streams.

Disconnecting gutter downspouts allows runoff to soak into the soil rather than flow into pipes, helping keep streams fuller in summer months. The East Multnomah SWCD, Gresham, and Portland have offered incentives and trainings for homeowners to build raingardens and disconnect downspouts.

ST MARY'S ETHIOPIAN CHURCH Bioswale Reduces Runoff along 92nd Ave



IN FALL 2013, 50 volunteers from Saint Mary's Church, the Council, Depave and Green Lents removed 2,400 square feet of asphalt by hand from the Church's parking lot. A month later, they installed 500 native plants. The project was paid for by Portland BES and an Ethiopian dinner fundraiser.

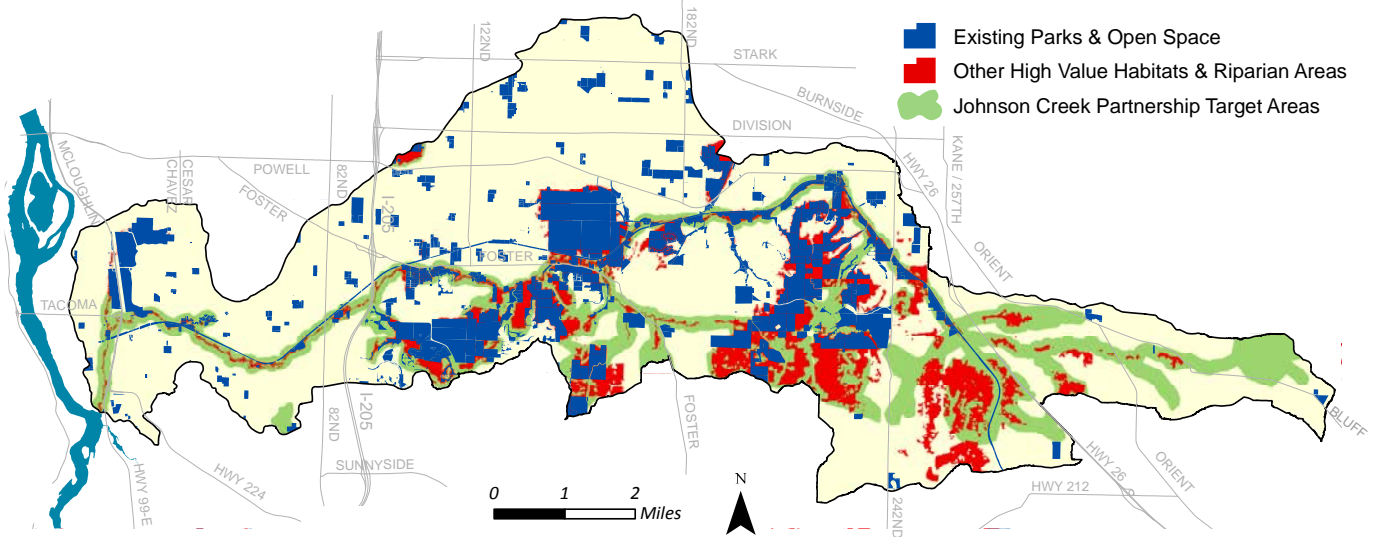
The bioswale performs as designed, soaking up stormwater from the parking lot and saving the church from annual flooding. It also reduces the amount of untreated run-off that enters nearby Johnson Creek.



New stormwater treatment demonstration projects will show people what's possible and reduce water quality impacts to Johnson Creek.

2015 WILDLIFE

HABITAT CONSERVATION PRIORITY AREAS¹



WILDLIFE in The Johnson Creek Watershed includes river otters, painted turtles, black-tailed deer, and coyotes. Beaver are active throughout the watershed, building dams that provide important habitat for juvenile salmon.

Native frogs and salamanders have been found in most wetlands surveyed. In fact rare species such as slender salamanders are found in streamside areas of Gresham. Other sensitive amphibians include red-legged frogs and Pacific giant salamanders.

Dense beds of western pearlshell freshwater mussels, whose reproduction depends on native fish, have been found from SE 156th up to the headwaters of Johnson Creek—many of them likely over 80 years old.

Pileated woodpeckers, great blue herons, bald eagles, and many other birds depend on the forests, streamside areas, and wetlands in the watershed. Both Portland BES and Portland Audubon conduct regular bird surveys at locations in the watershed.

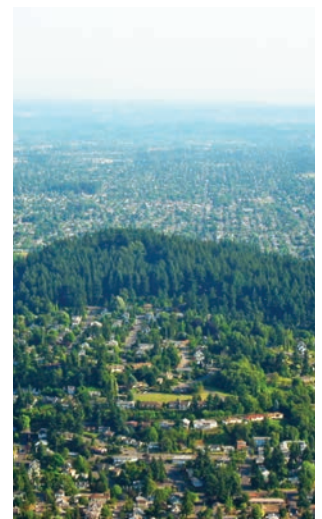
VOLUNTEER CITIZEN SCIENTISTS Freshwater Mussels in Johnson Creek

NATIVE FRESHWATER MUSSELS are struggling across North America, but substantial numbers of Western Pearlshell and Floater Mussels were found by the 75 Council volunteers trained by the Xerces Society. Upper Johnson Creek has larger beds of native mussels, but urban reaches—like the huge beds of floaters found under I-205—have happily surprised us! Unfortunately, surveyors also found invasive Asian clams abundant in Crystal Springs, a tributary. Since native mussels can live over 100 years, we're working with partners to protect their strongholds.



4,600 ACRES OF HABITAT CONSERVED Voters Endorse Ecological Health and Human Prosperity

IN 1990, GRESHAM voters passed a \$10.25 million bond measure to acquire 152 acres of forest in the Watershed. In 1995 and 2006, voters approved Metro bond measures to purchase natural areas, protecting 350 acres in the Johnson Creek Watershed. The City of Portland has conserved 350 acres of land, particular in floodplain areas, through the Willing Seller Program and other programs. Combined, Portland and North Clackamas Parks & Recreation manage more than 1,600 acres of riparian, wetland, grassland, upland forest, and hybrid parks in the Watershed.



¹ Data for high value habitat and parks & natural areas from Regional Conservation Strategy viewer. Data for Johnson Creek Partnership priorities provided by Portland BES.

2025 HABITAT CONSERVATION

JOHNSON CREEK Watershed wildlife habitat consists of upland forests, riparian woodlands, wetlands and streams. Here, there is an opportunity to preserve nature in and near our cities, even as growth occurs.

In the last decade, 6,000 acres in the Johnson Creek Watershed, more than 1/6 of the entire watershed, were incorporated into the Urban Growth Boundary. This includes parts of the City of Damascus and the communities of Pleasant Valley and Springwater. In 2010, additional areas of the Johnson Creek Watershed near Highway 26 in both unincorporated Multnomah and Clackamas Counties were designated as urban reserves to accommodate population and job growth over the next 50 years.

Together, we are striving to create a legacy of natural areas woven within our communities, so that all watershed inhabitants enjoy healthy places to live, work, and play for many generations to come.

Conservation will be guided by the 2012 Johnson Creek Acquisition Strategy, developed by watershed stakeholders to identify priority areas for conservation based on rare habitats, wildlife networks, and protecting larger intact areas, as well as insure public accessibility and environmental education opportunities. Through collaboration with partners and leveraged resources, we could achieve a remarkable natural area network that would warrant a name such as Forest Park East.

ACTIONS

USE THE JOHNSON CREEK ACQUISITION STRATEGY to guide support for partners' conservation efforts.

CONVENE LANDOWNERS & STAKEHOLDERS to refine our vision of the optimal future of the watershed – what would it look like if it were healthy?

EXPAND CITIZEN SCIENCE events (e.g., surveys and bio-blitzes) and web-based platforms (e.g., iNaturalist and iBird) to gather and share information about the diversity of wildlife in the watershed, with an initial focus on dragonflies (Xerces) and beaver.

CONTINUE TO PARTNER with Xerces and Audubon on educational events related to wildlife.

PROMOTE AND SUPPORT the Backyard Habitat Certification program

PROMOTE AND SUPPORT Friends of Trees urban tree plantings.

ADVOCATE for local and regional land-use planning and development plans and policies that are backed by watershed science.

POLICIES THAT PROTECT HABITAT Smart Growth for the Future

POLICIES AND REGULATIONS that protect intact habitat as nearby areas are developed are essential to maintaining and improving the health of Johnson Creek. Metro's Title 3 and Title 13 zoning regulations protect high value habitat, streams, floodplains, and wetlands. Urban growth boundaries along with urban and rural reserve designations limit the pace and intensity of development (85% of the Watershed is within the urban growth boundary).

Other important policies include urban forestry and stormwater management plans. In Portland, the City-wide Tree Project will help protect the urban forest canopy in Johnson Creek. In Gresham, a new Stormwater Plan sets the course for improvements.

Comprehensive Development Plans for Pleasant Valley, Springwater, and Damascus include protective zoning. In Gresham, Phase 2 of Pleasant Valley expansion will be a large-scale demonstration of Low Impact Development, where intact habitat is mostly protected and other areas restored.

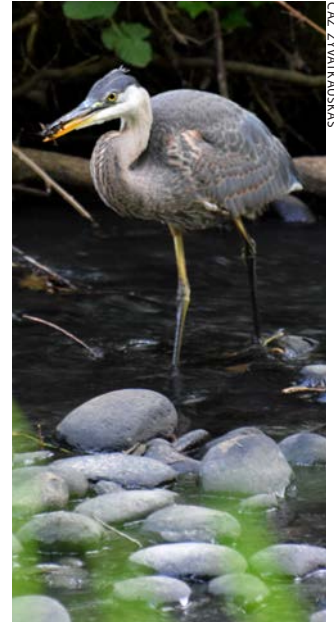


JOHN HAMM

HELPING NATURE IN URBAN AREAS Streamside Plantings, Backyard Habitat Certification & Street Trees

IN GRESHAM, MILWAUKIE, AND PORTLAND, the Council is working with over 20 urban landowners to control weeds and restore streamside forests on their properties. The Columbia Land Trust and Portland Audubon are working with over 200 households in the watershed on Backyard Habitat Certification. Friends of Trees has planted over 4,500 street trees in our basin.

Good wildlife corridors in developed areas are often along streams, but can also be networks of parks, yards, and natural areas with connected tree canopies and hedges, a diversity of native plants, shelter for wildlife, water sources and reduced pesticide use.



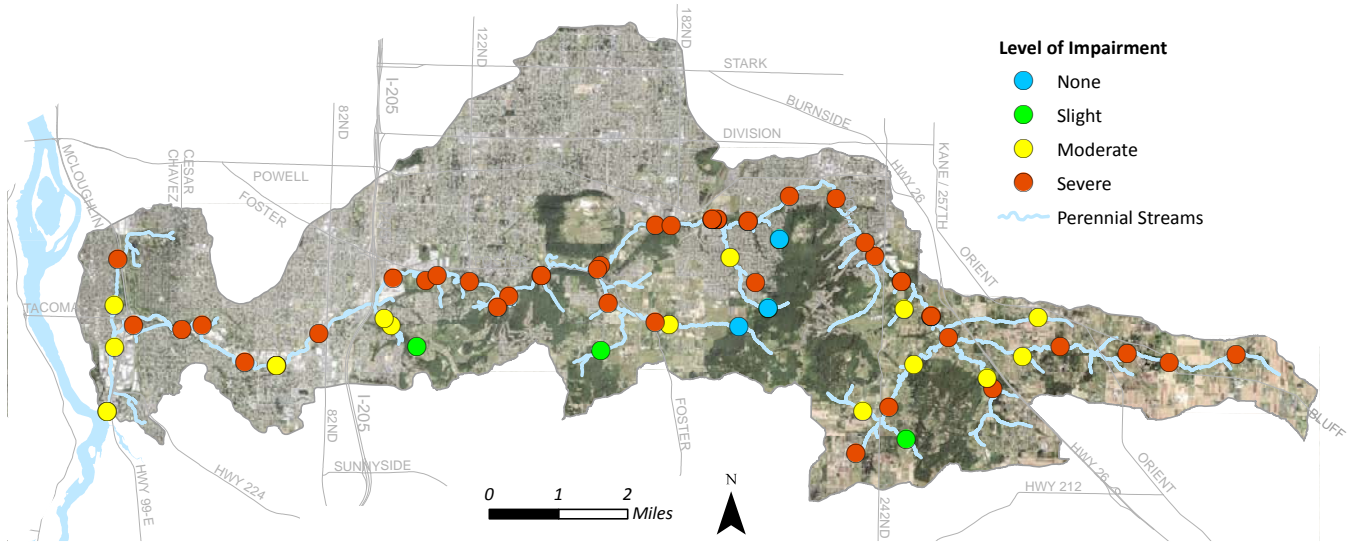
CAZ ZVATKAUSKAS



We have the opportunity to preserve nature in and near our cities, even as growth occurs.

2015 WATERSHED SCIENCE

MACROINVERTEBRATE MONITORING¹



LONG-TERM MONITORING and recovery of a watershed that is managed by five cities, two counties, a Metro regional government, and multiple state and federal agencies, requires intense, basin-wide coordination. Each jurisdiction or entity monitors many different parameters at different spatial scales across the watershed.

Our technical advisory committee, the Johnson Creek Inter-Jurisdictional Committee (IJC), works as a collaborative group, bridging urban and rural issues and finding common areas for study and implementation, while addressing multiple regulatory drivers (e.g., TMDL, NPDES, ESA)². Active participants include Multnomah and Clackamas Counties, the East Multnomah SWCD, the Cities of Portland, Gresham, and Milwaukie, the Watershed Council, the Oregon

Department of Environmental Quality, and the U.S. Geological Survey. The Council maintains a publicly-accessible Google Site where the IJC stores Johnson Creek data and reports.

In several cases, the IJC members have combined and analyzed these data at a watershed scale to provide a broader perspective. For example, each August for the past six years, the IJC has sampled 20 sites throughout the watershed for benthic macroinvertebrates (stream bugs). These macroinvertebrates respond to water quality and habitat conditions, showing us the range of healthy and degraded areas in our basin. Results are identifying diverse islands of biotic health in tributary headwaters, helping focus management on expanding habitat and improving water quality in these areas.

USGS HYDROLOGICAL RESEARCH Coordinated Science

SINCE 1999, the Cities, Counties, and Conservation Districts that manage parts of the Johnson Creek Watershed have cooperatively funded four USGS continuous streamflow and temperature gages based on what percentage of the watershed each given jurisdiction occupies. In years when one city cannot pay its share, other jurisdictions pitch in to maintain the gages. This hydrologic data is used to engineer floodplain restoration projects, as well as to better understand flood recurrence intervals. Every five years, the USGS focuses on a particular study topic. Having completed reports on pesticides, hydrology, and suspended sediment, the USGS will focus on tributary hydrology through 2019.



SCIENCE TALKS

“Think & Drink” about Johnson Creek



SCIENCE TALKS have been a very popular way to share watershed science with residents and colleagues. Since 2013, the Council has held eight pub talks at bars throughout the Watershed, including the Not-So-Boring Bar & Grill, Gresham’s 4th Street Pub, the Eagle Eye Tavern in Lents, Dig-A-Pony, and the Sellwood Public House. Topics have ranged from lamprey to landscape restoration to freshwater mussels. We plan to continue these events, occasionally partnering with other organizations.

¹ Data provided by the Cities of Gresham, Portland, and Damascus, JCWC, East Multnomah SWCD, and Multnomah County. ² TMDL (Total Daily Maximum Load) and NPDES (Non-point Discharge Elimination System) are programs guided by the Clean Water Act, and ESA stands for the Endangered Species Act. ³ Bruce Newton, Robin Jenkinson, and the Johnson Creek IJC. 2014. Johnson Creek Monitoring Strategy.

2025 INFORMATION HUB

THE INTER-JURISDICTIONAL COMMITTEE has developed a monitoring strategy to detect changes in watershed health over time – one based on coordination and data sharing across the basin³. Not only does monitoring allow us to demonstrate changes in watershed health over time, it also provides information for future project design and priority setting, and provides assurance to funders that their investments are being tracked.

There is currently a significant investment in monitoring by various entities within the basin. However, each program is intended to meet a specific objective and is focused on a specific geographical area of a jurisdiction. Based on our monitoring strategy, the Council and the IJC will continue to synthesize data at the basin scale to assess conditions and track changes in watershed health into the future.

Looking forward, we will emphasize monitoring parameters that integrate conditions over space and time. A core set of parameters for reporting on watershed health should include: macroinvertebrates, fish, temperature, riparian habitat, aquatic habitat, and tributary hydrology. Because of short-term variability, chemical water quality should be monitored more frequently and during storms at stations with streamflow gages.

Our goal is to serve as an information hub for Johnson Creek. To do so, the Council will continue to convene stakeholders and track restoration and monitoring data at the watershed scale. Not only does this allow us to demonstrate changes in watershed health over time, but funders can be assured that their investments are being tracked.

ACTIONS

IMPLEMENT Monitoring Strategy recommendations.

PROVIDE A CLEARINGHOUSE for monitoring data and maps. For better data organization and access, increase Council investment in data management and web resources.

IMPROVE RESTORATION PROJECT TRACKING and project-based photopoint monitoring.

COLLABORATIVELY MONITOR indicators including macroinvertebrates, tributary hydrology, fish, temperature, and riparian and aquatic habitat. Expand this in the Clackamas County portion of the watershed.

ORGANIZE Science Talks and annual Science Symposium.

SERVE AS A SPARKPLUG for the Inter-Jurisdictional Committee.

ENGAGE SCHOOLS and other non-profits in monitoring.

GATHER INFORMATION TO FILL DATA GAPS including pipe outfall locations and sources, tributary hydrology, and Water Rights.

SUPPORT monitoring and research by partner organizations.

REPORT on comprehensive watershed health every ten years.

USE MONITORING RESULTS to evaluate the project and program effectiveness and to inform future project design and priority setting.

ACADEMIC COLLABORATION

Working with University and College Instructors and Students

HUNDREDS OF COLLEGE STUDENTS volunteer each year and many student projects and graduate theses have focused on Johnson Creek. The most successful collaborations work with the Council and IJC up-front to use the best data to address current management needs.



BRUCE MACGREGOR

For example, Portland State University (PSU) students have helped the Council assess fish passage, prioritize areas for reforestation, survey residents, conduct outreach, monitor water quality, and much more. Portland Community College GIS students assist the Council in important mapping analyses each year. Reed College students monitor and enhance Crystal Springs. And, a number of Mount Hood and Clackamas Community College students have completed internships with the Council.

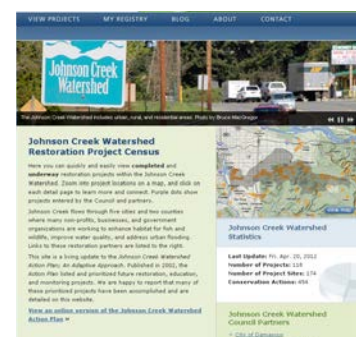
TRACKING RESTORATION ACROSS THE BASIN

Johnson Creek's Conservation Registry

THE COUNCIL, jurisdictional partners, private landowners, and other non-profits have implemented 132 restoration projects throughout the Johnson Creek Watershed.

This online catalog of restoration projects enables ongoing monitoring of tree growth and maintenance needs. It helps connect students and tours with the project sites. Also, it aids research into the effects of different restoration techniques on water quality, wildlife, or real estate values.

Descriptions and mapped locations for these projects are available at: jcw.cconservationregistry.org.



With a strong culture of stewardship in place, we've shifted the focus from not just where we can work, but where the science tells us it's a priority to work.

THE COUNCIL & PARTNERS

THE JOHNSON CREEK WATERSHED COUNCIL is a 501(c)3 non-profit whose mission is to promote restoration and stewardship of a healthy Johnson Creek Watershed through sound science and community engagement. Established in 1995, the Council plays a vital role in engaging a wide diversity of representative stakeholders and coordinating a holistic approach to improving watershed health. In the Johnson Creek Watershed, coordination is particularly crucial; seven jurisdictions (five cities and two counties) manage parts of a relatively small but densely populated watershed.

The Council employs five permanent staff members, two full-time and three part-time, and an AmeriCorps member. The Board of Directors includes eight citizen-directors-at-large and six representatives appointed to the Board by their respective jurisdictions.

The Council runs successful programs in ecological restoration and monitoring, volunteer stewardship, environmental education, community outreach, and regional land use advocacy. Events are offered throughout the year, and in 2014, the Council mobilized 1,300 volunteers who contributed 7,500 hours cumulatively in activities ranging from restoration stewardship, citizen science, event production, and general office support.

Thirty years ago, the Johnson Creek Marching Band began shifting the paradigm as to how Johnson Creek is viewed, from a degraded eyesore to a valuable community resource. Now, with a strong culture of stewardship in place, we are shifting the focus from not just where we can work, but where the science tells us it's a priority to work. This Action Plan is our science-based approach to improving watershed health.

TIMELINE

1984 Friends of Johnson Creek / Johnson Creek Marching Band formed.

1990 Johnson Creek Corridor Committee formed.

1995 Johnson Creek Resources Management Plan approved and formally adopted by various watershed jurisdictions.

May 3, 1995 First meeting after renaming as the Johnson Creek Watershed Council (JCWC).

1995 Fiscal agent agreement signed between JCWC and East Multnomah SWCD.

1995 Oregon House Bill 3441 passed, Watershed Councils are defined as locally organized, voluntary, non-regulatory groups.

1996 JCWC Watershed Coordinator hired with funding from the Governor's Watershed Enhancement Board, City of Portland, and City of Gresham.

1997 The Oregon Plan for Watersheds and Salmon placed into statute by the Oregon State Legislature.

2001 JCWC designated a (501(c)3) tax exempt organization by the IRS.

2002 JCWC published Johnson Creek Watershed Action Plan; An Adaptive Approach.

2012 JCWC published organizational Strategic Plan.

2015 JCWC and partners achieved the majority of previous plan recommendations and launched a new Watershed Action Plan.

THANK YOU PARTNERS

THOUSANDS OF INDIVIDUALS

contribute funding and over 7,500 volunteer hours each year. "Friends of" groups, Neighborhood Associations, and park stewards enhance areas along Johnson Creek.

PRIVATE LANDOWNERS

Hundreds of private landowners work with the Council and Conservation Districts to reforest streamside areas, control weeds, and improve wildlife habitat and water quality.

WATERSHED BUSINESSES

Many businesses give time, donate services, contribute funds, and steward properties.

OTHER NON-PROFITS

Friends of Trees, Portland Audubon, Xerces, Depave, and SOLVE are among the many other non-profits with whom the Council collaborates. Many others volunteer and collaborate on educational and community-building events.

EDUCATIONAL INSTITUTIONS

K-12 Schools conduct service-learning field trips with the Council. Portland State University, Reed College, and Portland, Mount Hood, and Clackamas Community Colleges conduct research, class projects, and volunteer.

JURISDICTIONAL PARTNERS

Cities of Portland, Gresham, Milwaukie, and Damascus, Clackamas and Multnomah Counties, East Multnomah and Clackamas County Soil and Water Conservation Districts, and Metro.

REGIONAL, STATE, AND FEDERAL AGENCIES

U.S. Geological Survey, the Oregon Departments of Environmental Quality, Agriculture, Fish & Wildlife, and the Oregon Water Resources Department, provide technical assistance to the Council.

ACTION PLAN FUNDING

Meyer Memorial Trust and Clackamas WES.



OREGON WATERSHED COUNCILS are grassroots community groups comprised of citizens who want to help protect, restore and enhance the local watershed where they live, work, and play. They are locally organized, voluntary, non-regulatory organizations, and are intended to be broadly representative of the stakeholders in their respective areas. More than 70 Watershed Councils are working to improve watershed health across the State. Supported in part by State Lottery dollars, a core tenet is that in addition to fish and wildlife, healthy watersheds support the economy and quality of life in Oregon.



Volunteer! Serve alongside the Council at outdoor events year-round.

CONTACT US

503-652-7577 www.jcwc.org
1900 SE Milport Rd., Suite B
Milwaukie, OR 97222