Tuesday, October 16th, 2018
1:00 pm to 5:00 pm

Reed College
Performing Arts Building – Room 320

Parking Available in the West Lot

Map

The Johnson Creek Science Symposium is a joint production of the Johnson Creek Watershed Council, Reed College and the Johnson Creek Interjurisdictional Committee

Program & Schedule

1:00 PM	Introduction	Symposium Organizer: Daniel Newberry, Johnson Creek Watershed Council
	Session 1: Water Temperature	Session Moderator: Noelwah Netusil, Reed College
	Are all dams created equal? Comparison of the effects of Human and Beaver Dams in Johnson Creek in Gresham	Katie Holzer, City of Gresham
	Influence of beaver ponds on water temperatures in Errol Creek	Julia Bond, Portland B.E.S.
	Hydrologic trends of streamflow and temperature in the Johnson Creek Watershed	Emma Brennaman, Portland State University
	Q & A, Session 1	
	Session 2: Fish & Wildlife	Session Moderator: Roy Iwai, Multnomah County
	Monitoring ESA-protected species in the Johnson Creek watershed using eDNA	Melissa Brown, Portland B.E.S.
	Beaver Surveys in Johnson Creek: three years of dam data.	Chuck Lobdell, JCWC
	Salmon Sanctuaries in Portland	Ronda Fast, Portland B.E.S.
	Q & A, Session 2	
2:50 PM	**Break & Poster Session (0:25)**	
	Session 3: Flooding & Floodplains	Session Moderator: Bruce Newton, Johnson Creek Watershed Council
	Floodplain Designation and Property Sale Prices in an Urban Watershed	Noelwah Netusil, Reed College
	Hydraulic Modeling of Johnson Creek in the East Lents Area	Gary Wolff, OTAK, Inc.
	Oxbow Scour Repair	Ali Young, Portland B.E.S.
	Q & A, Session 3	
	Session 4: Land & Ecosystem Services	Session Moderator: Katie Holzer, City of Gresham
	Equitably Growing the Urban Forest	Vivek Shandas, Portland State University
	Legacy Landfills in the Johnson Creek Watershed	Heather Kuoppamaki, ORDEQ
	Metro's Land Acquisition Strategy in the Upper Johnson Creek Watershed	Jonathan Soll, Metro
	Q & A, Session 4	
4:57 PM	Closing Remarks, End of Symposium	

Abstracts

Julia Bond (speaker) and Jennifer Antak, City of Portland, Bureau of Environmental Services

Title: Influence of beaver ponds on water temperatures in Errol Creek

Abstract: Johnson Creek suffers from warm water temperatures throughout the summer and regularly exceeds DEQ's temperature criterion for salmonid rearing and migration. Errol Creek is one of the few cold-water tributaries to Lower Johnson Creek. It has a small watershed, but with constant groundwater inputs its flows are cool and consistent, providing a valuable source of cool water to endangered salmonids. To protect this important resource, the City of Portland's Bureau of Environmental Services and Bureau of Parks and Recreation purchased several residential and commercial properties along Errol Creek and implemented multiple stream restoration projects to improve habitat. Once the stream restoration projects were complete, the beaver moved in and built multiple dams that have altered flow patterns and increased ponding. There are three large dams along Errol Creek. Two have been in place for several years, while the third (near SE 45th Ave) was built in late 2017. During the summer of 2018, the City of Portland deployed a series of temperature probes throughout the Errol Creek watershed to evaluate the different thermal impacts of the three beaver ponds. Probes were deployed to measure temperatures in the stream as well as the ponds to evaluate what sort of temperature changes were occurring in the watershed and whether a modification to the management of the system could improve water quality. The beaver activities pose a new management challenge for the City to protect the nearby infrastructure from flooding, while maintaining habitat for both fish and wildlife.

Emma Brenneman & Heejun Chang, Department of Geography, Portland State University

Title: Hydrologic trends of streamflow and temperature in the Johnson Creek Watershed

Abstract: The objective of this study is to assess changes in streamflow and stream temperature characteristics over the urban-rural gradient for the Johnson Creek watershed in the Portland Metropolitan Area. Four stream temperature and four streamflow metrics were derived from the four USGS stream gauges in the Johnson Creek watershed that represent various aspects of how hydrology can be altered due to anthropogenic influence, such as land development towards more impervious surfaces and less native plant cover. The length of USGS stream gauges records vary, with the longest record comprising 78 years of data, and the shortest record comprising 18 years of data. Trends of streamflow and stream temperature may vary depending on contributing watershed characteristics, riparian conditions, or distinct hydrogeology at different locations in the watershed. Streamflow and temperature metrics were analyzed for monotonic trends using the non-parametric Mann-Kendall trend test. Analyzing these values at annual and monthly subsets allows for more precise detection of hydrologic monotonic trends. Preliminary results show significant positive and negative trends of stream temperature and discharge metrics at all four USGS locations in the watershed, though certain stream gauges show more significant trends compared to others. The findings of this study will highlight the importance of spatial and temporal scale and land use in assessing patterns of discharge and temperature in urban settings.

Melissa Brown, City of Portland, Bureau of Environmental Sciences

Title: Monitoring ESA-protected species in the Johnson Creek watershed using eDNA

Abstract: A method that extracts DNA from aquatic habitats has been used to explore fish population structure in City monitoring efforts. In such sampling, genetic material shed by organisms – environmental DNA (eDNA) – is collected by filtering streamflow, and analyzed for species-specific DNA arrangements using polymerase chain reaction (PCR) sequencing. BES has been using this passive method to sample reaches throughout its watersheds, often where and when conventional methods are not feasible. Here I will briefly present recent salmon, trout, and lamprey results, focusing on the Crystal Springs Creek reach of the Johnson Creek watershed.

Ronda Fast, City of Portland, Bureau of Environmental Services

Title: Salmon Sanctuaries in Portland

Abstract: The Salmon Sanctuary designation was created by the City of Portland to raise public awareness about salmon in the city, celebrate restoration successes, and inspire Portlanders to be stewards of salmon and champions for their recovery. Salmon Sanctuaries are streams that city scientists and resource experts evaluate as being the best available habitats in Portland. These are streams of special importance as resting, feeding and even spawning for threatened fish as they journey through Portland to and from the Pacific Ocean. Using data from BES's watershed monitoring program (PAWMAP), GIS, and partner agency research, city scientists developed salmon-specific criteria by which streams in Portland can be evaluated to measure remaining limiting factors and help identify actions to achieve eligibility. Crystal Springs Creek is the first stream in Portland, but will not the last, to earn the Salmon Sanctuary designation thanks to the extensive investments made to improve access and habitat. In addition to recognizing areas of high quality, the designation is designed to provide a roadmap for additional actions or protections needed to preserve and enhance wild salmon runs into the future.

Katie Holzer, City of Gresham

Title: Are all dams created equal? Comparison of the effects of Human and Beaver Dams in Johnson Creek in Gresham

Abstract: Johnson Creek can get pretty warm in the summer—often too warm for salmon and trout. We know that human-constructed dams in the creek often heat it up, but what about all of those beaver dams? In this study we compared summer temperatures in Johnson Creek and its tributaries in relation to dams created by humans and beavers throughout Gresham. We placed continuous temperature monitoring probes above and below dams over several years. We also took instantaneous measurements of temperatures at different depths throughout the ponds created by dams on hot days. We found that, in general, human dams warmed the creek substantially while beaver dams did not. Human dams generally increased the stream temperatures on warm days by 2-9*C. Beaver dams generally had no affect on stream temperature or even decreased temperatures. Temperature stratification was observed in all ponds with water ~1*C cooler at depths as shallow as ~0.5 m. This study indicates that there are substantial differences in the way that human and beaver dams affect stream temperatures in Johnson Creek. Observations during the study suggest that a main difference is in the way that water flows past the dams. Human dams are usually impenetrable to water and the creek generally spills over the top taking the hottest surface water with it. Beaver dams allow water to flow through the pore spaces of sticks and mud so that cooler water from below the surface can make its way downstream.

Heather Kuoppamaki, Oregon Department of Environmental Quality

Title: Legacy Landfills in the Johnson Creek Watershed

Abstract: Landfills and dumps have been used for decades as a final disposal location for wastes. Before state and federal regulations were enacted in the 1970s and 1980s, dumps were not required to have the extensive controls required today to protect human health and the environment. Burning of wastes was common and many of the dumps accepted all types of wastes - including hazardous wastes, liquid wastes, car bodies, white goods, and industrial wastes. Wastes were often used as a way to fill in what we know today are sensitive areas, such as wetlands and streams. Additionally, dumps tended to be smaller and more common - many communities had their own dumps. In fact, we know about six historic dumps within the Johnson Creek Watershed (and over 500 across the entire state). While these dump have been closed for decades, we are still investigating potential risks from releases of landfill gas and leachate. In this presentation, we'll learn about the dumps in the Johnson Creek Watershed and what we know about these specific sites and their potential impacts.

Chuck Lobdell, Johnson Creek Watershed Council

Title: Beaver Surveys in Johnson Creek: three years of dam data.

Abstract: The Johnson Creek Watershed Council has been conducting beaver surveys as part of our community science programs since 2016; our third season of surveys recently concluded. Volunteer surveys cover 14 reaches of stream, and volunteers collect information on dam composition, activity, condition, water height differential, as well as evidence of beaver activity such as slides, tunnels or chews. Initially, we asked where in the watershed are the beavers, why are they there, how do they affect the land and how might we work with beavers to restore habitat. Monitoring tracks changes over time, with a main goal of understanding where is beaver activity consistent over time, and where are dams consistently built and rebuilt with the objective of producing data that can be used to inform and drive restoration.

Noelwah R. Netusil (speaker, Reed College), Klaus Moeltner (Virginia Tech), and Maya Jarrad (Reed College)

Title: Floodplain Designation and Property Sale Prices in an Urban Watershed

Abstract: Increasing urbanization, and the projected effects of climate change on urban streams, will put more people and properties at risk of flooding. Our study uses a repeat sales model to estimate the effect of floodplain location on single-family residential sale prices for a highly urbanized part of the Portland, Oregon metropolitan area. The most common approach used in the existing literature uses tax lot boundary to determine if a property is in a floodplain. However, flood insurance is only required in the United States if a homeowner has a federally-backed mortgage and if the residence, or a structure attached to the residence, is inside or intersects a 100-year floodplain. Using this "building footprint" approach we estimate that properties sell for, on average, 21.5% less than properties in the rest of the study area while the "tax lot" approach leads to an average estimated decline of 8.6%. A second model estimates separate effects for properties with a building footprint in or intersecting a floodplain and properties where only the tax lot is in the floodplain. Estimated effects for "tax lot only" properties in the 100-year floodplain are positive, which may be due to the amenities of stream proximity and no requirement to purchase flood insurance, while estimated coefficients for building footprint properties are negative. Using building footprint as the basis for determining if a property is in a 100-year floodplain is a much clearer signal of risk and capitalization than approaches used in the existing literature.

Vivek Shandas, Portland State University

Title: Equitably Growing the Urban Forest

Abstract: Our urban forest provides a host of ecosystem services, including flood attenuation, clean water and air, and mediating temperature extremes. Yet an emerging challenge in managing greening efforts is the recognition that communities experience inequitable benefits from adjacent urban forests. Needed are novel ways to meet city mandates for tree canopy, improve watershed conditions, provide ecosystem services, and support community health and well-being is proving difficult for communities around the world. Here in Johnson Creek, we have a timely opportunity to guide greening efforts through integrating data and technology with community advocacy. In this presentation, we integrating community perspectives (survey results) and empirical research on environmental stressors (field campaigns), we offer a means for identifying areas of the city and watershed where expansion of tree canopy can help achieve simultaneous goals. The presentation will conclude with a presentation of a new online tool, BranchOutPDX, which is a platform for creating an evidence-based approach for equitably expanding the urban forest.

Jonathan Soll, Metro

Title: Conservation of the Ambleside Reach of Johnson Creek

Abstract: With voter and community support from bond measures in 1995 and 2006, Metro and partners have worked to protect the "Ambleside Reach" of Johnson Creek. Twenty-one acquisitions over 21 years, including two deals in 2018, and $6.8 million later, 111 acres of this 3 mile reach are in public ownership. Metro's Ambleside and Upper Johnson Creek natural areas contain 83% of the banks of this section of the creek. Funding from the bond measures and the natural areas and parks levies of 2013 and 2016 have also funded meaningful uplift for water quality and wildlife habitat. Most of the area has had invasive species removed and natives planted. More recently several in-stream projects have improved floodplain connectivity, removed houses, dams, roads or other infrastructure and improved in-stream habitat complexity with the addition of large wood.

Gary Wolff, Otak, Inc.

Title: Hydraulic Modeling of Johnson Creek in the East Lents Area

Abstract: For decades flooding has been a significant problem along Johnson Creek in the East Lents Area, defined here as the reach of the creek between I-205 and SE 122nd Avenue. The frequency of flooding onto Foster Road and areas to the north of the creek was reduced significantly through construction of the Foster Floodplain Natural Area project, but flooding and the impacts of being in a FEMA-designated floodplain continue to be a limiting factor for economic investment and neighborhood stability. The East Lents reach of Johnson Creek is complex with unique geomorphic and topographic characteristics, which in turn result in unique and complex flooding characteristics. These characteristics have presented a significant challenge to hydraulic modeling and the development of flood mitigation measures. This presentation will summarize the salient hydraulic characteristics of the reach and discuss previous and current approaches to model the flooding. Strategies for future flood mitigation will also be presented.

Ali Young, City of Portland, Bureau of Environmental Services

Title: Oxbow Scour Repair

Abstract: The Oxbow Scour Repair project is located on the Johnson Creek Oxbow at SE 44th between SE Umatilla and Tenino. The site experienced rapid erosion along the left bank over five years. In 2013 the bank moved roughly 15 feet to the east, eroding about 400 ft² of stream bank. During the December 7, 2015 flood the creek moved another 10-30 feet, eroding about 1,600 ft². BES was concerned that further erosion would cause property loss, damage to the nearby right-of-way, and damage to an upstream stormwater outfall. The project goal is to provide rearing and refuge habitat for ESA-listed salmonids and stabilize the stream bank to protect private property and public infrastructure. The project provides low flow and flood refugia for ESA-listed salmonids and protection to eroding banks while dissipating and redirecting the high shear stresses causing bank erosion. The project was constructed over 3 weeks during August 2018. Twenty-nine rootwads and 9 logs were embedded into 1-2 fabric encapsulated soil (FES) lifts along 100 feet of channel. A two to four-foot scour pool was excavated beneath the logs prior to installation. The rootwads extend over the pool and into the channel to provide overhead cover for fish and dissipate flow energy as it is directed against the bank. The logs are expected to engage with water from low flows up to the maximum modeled flow. Slash was placed between the layers of larger logs to provide smaller interstitial spaces for juveniles. Primary ballast was provided by burial (backfill and FES lifts), with logs buried 20 to 25' in the bank. Those logs not buried two thirds in length were attached to other logs by a fully-threaded rod. The rod was countersunk with 3" diameter hole, 2" deep at the outside face of the logs. The footprint of the log jam was formatted to fit within the BES property line and provide a 35' buffer from a native 34" DBH Douglas Fir on the property. The site will be planted this winter with 100 bareroot trees, 400 bareroot shrubs, 300 live shrub cuttings, and 200 emergent sedge/rush plugs.

Posters:

Junjie Chen, Portland State University

Title: Examining Discharge-Turbidity Dynamics during storms in Urbanizing Catchments using Hysteresis and SWAT Model

Abstract: Frequent intense precipitation events in the Pacific Northwest can mobilize and carry sediment and pollutants into rivers, impacting water quality. However, it is unknown how seasonal rainfall, antecedent hydrologic conditions, and land cover type in different catchments can impact the relationship between discharge and turbidity. Using hourly discharge, rainfall, and turbidity data collected from 2008 to 2017, we examined the temporal variability of the discharge-turbidity relationship in the Johnson Creek and Clackamas Rivers by season and event. Four monitoring stations were chosen with different degree of development and land cover type to examine spatial variability. We used log scaled rating curves, local multivariate regression, hysteresis analysis, and correlation to examine the relationship among discharge, turbidity, and rainfall variables. Preliminary results revealed a strong correlation between discharge and turbidity levels during early and late wet seasons in Clackamas but not Johnson Creek. Hysteresis analysis showed greater spatial variability in time lags between turbidity peak and discharge peak in less developed watersheds. Additionally, the Soil and Water Assessment Tool (SWAT) Model was used to calibrate historical rainfall and discharge data for the Clackamas Watershed to examine discharge and sediment yield. Preliminary results showed that using the PRISM Climate dataset from Oregon State University yield promising results for the Clackamas watershed, further model calibration, and validation is needed to improve prediction accuracy and applicability of SWAT in Johnson Creek to forecast discharge, sediment, and nutrient yield. A deeper understanding of discharge and sediment runoff behaviors with climate change and land cover change can aid stakeholders in making crucial water management decisions.

Will Daniel (Reed College), **Shulav Neupane** (Reed College), **Noelwah R. Netusil** (Reed College), **Carolyn Kousky** (University of Pennsylvania), **Howard Kunreuther** (University of Pennsylvania), and **Jacob Sherman** (Portland Housing Bureau)

Title: Flood Insurance Survey and Home Characteristics: Lents and Powellhurst-Gilbert Neighborhoods

This poster describes a survey conducted mid-August to mid-October, 2018 to study flood risk, flood literacy and willingness-to-pay for flood insurance in the Lents and Powellhurst-Gilbert neighborhoods of Portland. The survey also assessed Portland's innovative Flood Insurance Savings Program, which provided qualified residents with an elevation certificate and counseling with a flood insurance agent. GIS-derived variables about the characteristics of single-family residential properties in the study area, such as projected flood inundation during a 100-year event, are also detailed.

Noah Jenkins, Johnson Creek Watershed Council

Title: Inline Ponds in the Johnson Creek Watershed

Stream temperatures in Johnson Creek and its tributaries often violate the TMDL established by Oregon DEQ for rearing salmonids. JCWC staff sought information on what contribution to this might be coming from human-made, inline ponds. We selected eight such ponds, located throughout the watershed, and placed HOBO temperature loggers up- and downstream of the ponds, and took episodic field measurements of streamflow, temperature, and dissolved oxygen, both in the stream (above and below

the pond) and in the ponds themselves. We found all ponds for which we could make a determination increased stream temperature, often significantly. Ponds showed minor thermal stratification, based on limited field measurements. In several cases, stream temperatures above the pond were consistently below the temperature standard, while temperatures below the pond exceeded the standard for much of the study period. Inline ponds appear to contribute significantly to temperature TMDL violations in the Johnson Creek watershed.

Biographies

Julia Bond is an Environmental Specialist with the City of Portland's Bureau of Environmental Services' Science Integration Division. Julia's work focuses on evaluating water quality in Portland's rivers and stream. She is responsible for environmental analyses, assisting in the implementation of regulatory activities and projects, and conducting technical water quality and natural resource evaluations related to stormwater and watershed health. Julia has a master's degree in Environmental Science with a focus in water resources, as well as a master's degree in Public Affairs from Indiana University—Bloomington

Emma Brenneman is a master's student in the Department of Geography at Portland State University studying with Professor Heejun Chang. She attended the University of Oregon as an undergraduate where she studied Spanish literature and second language teaching, as well as an environmental geography. After two years of serving with AmeriCorps National Civilian Community Corps and the Clark Public Utilities StreamTeam, Emma is increasingly interested in how both the built environment and natural environment can build resilience to land use change and climate change. She is a graduate student fellow of the Institute for Sustainable Solutions at PSU and a fellow of the Urban Resilience to to Extremes Sustainability Research Network sponsored by US National Science Foundation.

Melissa Brown has been a senior fish biologist with the Bureau of Environmental Services since 2010. Prior to that position, she served as a habitat restoration specialist with the Lummi Nation Dept. of Natural Resources. In her current role, Melissa focuses on habitat and population assessment of the city's fish and wildlife; imparting ESA guidance and implementation in City projects; providing design, development, and consultation services for City-sponsored surface water projects; and managing bureau certification standards and requirements set by the City's Salmon Safe certification (the first in the world!).

Ronda Fast is an Environmental Program Coordinator for the City of Portland, Bureau of Environmental Services with the Science Integration Division. Ronda graduated from Portland State University with degrees in Geography and Community Development.
Ronda works on inter-agency coordination, permitting, and outreach for watershed restoration projects and programs for BES, including Crystal Spring Creek projects, restoration at Oaks Bottom Wildlife Refuge, and the watershed monitoring program.
When not remodeling her house, Ronda can be found exploring the Pacific Northwest by boat, bike, and foot.

Katie Holzer is a Watershed Scientist with the City of Gresham where she conducts studies of water quality in urban streams. She has a Ph.D. in Ecology from the University of California, Davis where she studied habitat values of urban stormwater ponds.

Roy Iwai has managed the Water Quality Program in the Transportation Division of Multnomah County for the past 11 years. He coordinates monitoring and management of watersheds of the unincorporated County, including Johnson Creek. Roy facilitates the Beaver Creek Conservation Partnership and also leads the Clean Rivers Coalition, a new clean water outreach collaborative in western Oregon. Roy has a Masters of Science degree from Louisiana State University with research in wetland biogeochemistry.

Heather Kuoppamaki is an Environmental Engineer at Oregon Department of Environmental Quality. Heather has been working in the environmental engineering field for over 13 years, and has been at the DEQ for the last 3 years. Heather's work has included landfill design and construction as well as landfill redevelopment.

Chuck Lobdell is a professional fish and wildlife biologist with 21 years of aquatic habitat restoration experience in the Pacific Northwest. Most of his professional career has been focused on restoring

wetlands and estuarine habitats, including showcase projects like Smith and Bybee Lakes and Bandon Marsh National Wildlife Refuge. His new role with JCWC focuses on fish passage and stream restoration, as well as stormwater projects. Chuck earned both his bachelors and master's degrees from the University of Idaho.

Noelwah R. Netusil is the Stanley H. Cohn Professor of Economics at Reed College. Her current research explores the impact of stream restoration projects, and floodplain location, on property values. A new project explores flood insurance literacy, willingness-to-pay for flood insurance, and flood risk perceptions in the Lents and Powellhurst-Gilbert neighborhoods. Dr. Netusil serves on the Independent Economic Analysis Board of the Northwest Power and Conservation Council and on the Urban Ecosystem Research Consortium (UERC) of Portland-Vancouver steering committee. She is an Associate Editor for *Landscape and Urban Planning* and is on the editorial board of *Land Economics*.

Daniel Newberry is the Executive Director of the Johnson Creek Watershed Council. He has also served as Executive Director of both the Siskiyou Field Institute and the Applegate River Watershed Council, both in Southern Oregon. He has also managed his own environmental and non-profit consulting company. Prior to that, he worked as a hydrologist for the Mt. Hood National Forest and the Hoopa Valley Tribe. He holds a B.A. in Physics from Middlebury College and a Masters of Forest Science from the Yale School of Forestry and Environmental Studies. He was a software engineer in private industry for eight years prior to entering the environmental field.

Bruce Newton is a Director at the Johnson Creek Watershed Council. Now retired, Bruce was the Director of the West National Technology Support Center of the Natural Resources Conservation Service – an agency of the US Dept. of Agriculture. Prior to moving to Oregon, Bruce worked at the US Environmental Protection Agency in Washington, DC, where he developed and managed national water quality programs.

Vivek Shandas is a Professor of Urban Studies and Planning and the Research Director for the Institute for Sustainable Solutions at Portland State University. Dr.Shandas' research aims to address policy relevant questions by examining the feedbacks among urban form, governance systems, and human health and well being. This talk will provide a summary of over a decade of research examining the implications of development patterns on tree canopy in the Portland metro region, with a specific emphasis on the role of trees in mediating biophysical (e.g. urban heat and air quality) and social behaviors (e.g. preferences and energy use). Dr.Shandas serves as Chair of the City of Portland's Urban Forestry Commission, and serves on several regional and national advisory boards.

Jonathan Soll has been the Science Division Manager for the Portland, Oregon based Metro Regional Government's Natural Area Program since 2009. He leads a team of natural resources scientists responsible for setting natural area acquisition and restoration priorities and for implementing and tracking restoration projects on Metro's portfolio of nearly 17,000 acres. Jonathan and his team are also responsible for representing Metro on conservation science issues and working with partners on conservation oriented projects throughout the region.
Jonathan's training includes a biology degree from Reed College and a Master's degree in Forest Ecosystem Analysis from the University of Washington, College of Forest Resources; plus 25 years in the school of hard knocks doing practical conservation biology and natural resources management.
Jonathan's conservation work has focused on three main tracks: restoration ecology, especially controlling invasive species to restore high quality habitat, conservation planning and monitoring for enhancing management effectiveness and developing conservation priorities for large landscapes.
Before joining Metro in 2009 Jonathan worked for the Nature Conservancy in Oregon and Washington for 16 years.
Jonathan's favorite wild habitats include oak savanna, open oak-pine-fir woodland and subalpine meadows, but they are all nice.

Gary Wolff is a senior hydraulic at OTAK, Inc. in Portland, Oregon. He has over 35 years of experience including river and stream restoration, floodplain analysis and flood control, channel stability analysis and design, hydraulic design of bridges and culverts, bridge scour, dam removal, and environmental studies. Gary is an expert in the application of computer modeling software, including rainfall-runoff modeling, steady and unsteady open-channel flow modeling, two-dimensional hydrodynamic modeling, and sediment routing. He has taught hydraulic modeling for various organizations throughout the Northwest. Gary has been working on modeling of Johnson Creek flooding in the East Lents area over the past 10 years including the modeling to support the design of the Foster Floodplain Natural Area and more recently modeling to support the Oregon Solutions led Lents Stabilization and Job Creation Collaborative.

Ali Young works for the City of Portland, Bureau of Environmental Services as an Environmental Specialist providing planning, project management, permit and grant application, and other support for floodplain and stream restoration projects. She performs research and technical analysis on watershed, stream, and floodplain conditions. She's worked closely on the following projects: Pleasant Valley Concept Plan, Johnson Creek Restoration Plan, Portland Watershed Management Plan, Schweitzer Natural Area, Foster Floodplain Natural Area, Luther Road Restoration, Powell Butte Stormwater Ponds, Errol Wetlands, Errol Creek Confluence, Lower Errol Heights, Oxbow Scour, and Springwater Wetlands.