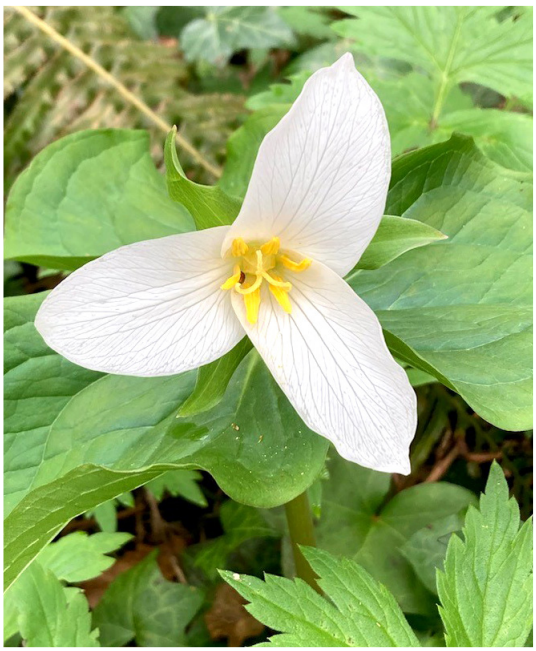
CLIMATE CHANGE

INVASIVE SPECIES

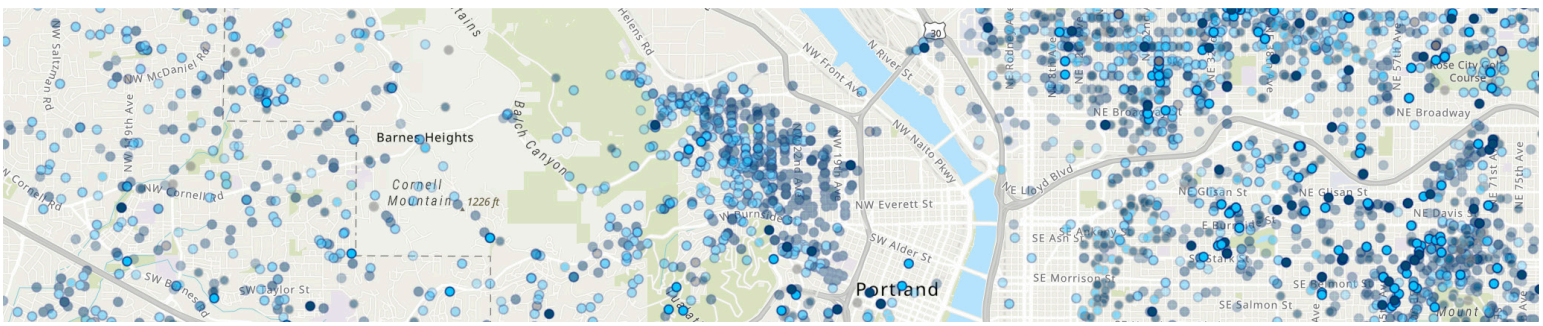
22ND ANNUAL Urban Ecology & Conservation Symposium

MARCH 11, 2024

URBAN ECOSYSTEMS



URBAN WILDLIFE



Graphic design

We wish to thank Chris Dodge at Bird Alliance of Oregon for cover page graphic design.

Thanks to the following photographers

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From top to bottom:

White Stonecrop (*Sedum album*) on ecoroof – Michelle Hesek, Portland State University

Emerald Ash Borer (*Agrilus planipennis*) – iNaturalist, Chase G. Mayers, Public Domain

Vaux's Swifts (*Chaetura vauxi*) entering Chapman Elementary School chimney – Tara Lemezis, Bird Alliance of Oregon

Western Trillium (*Trillium ovatum*) – Amy Chomowicz, City of Portland Bureau of Environmental Services

Tryon Forest Adventures – Friends of Tryon Creek

Coyote (*Canis latrans*) sightings map, Portland Urban Coyote Project – Zuriel van Belle, Portland State University

REED

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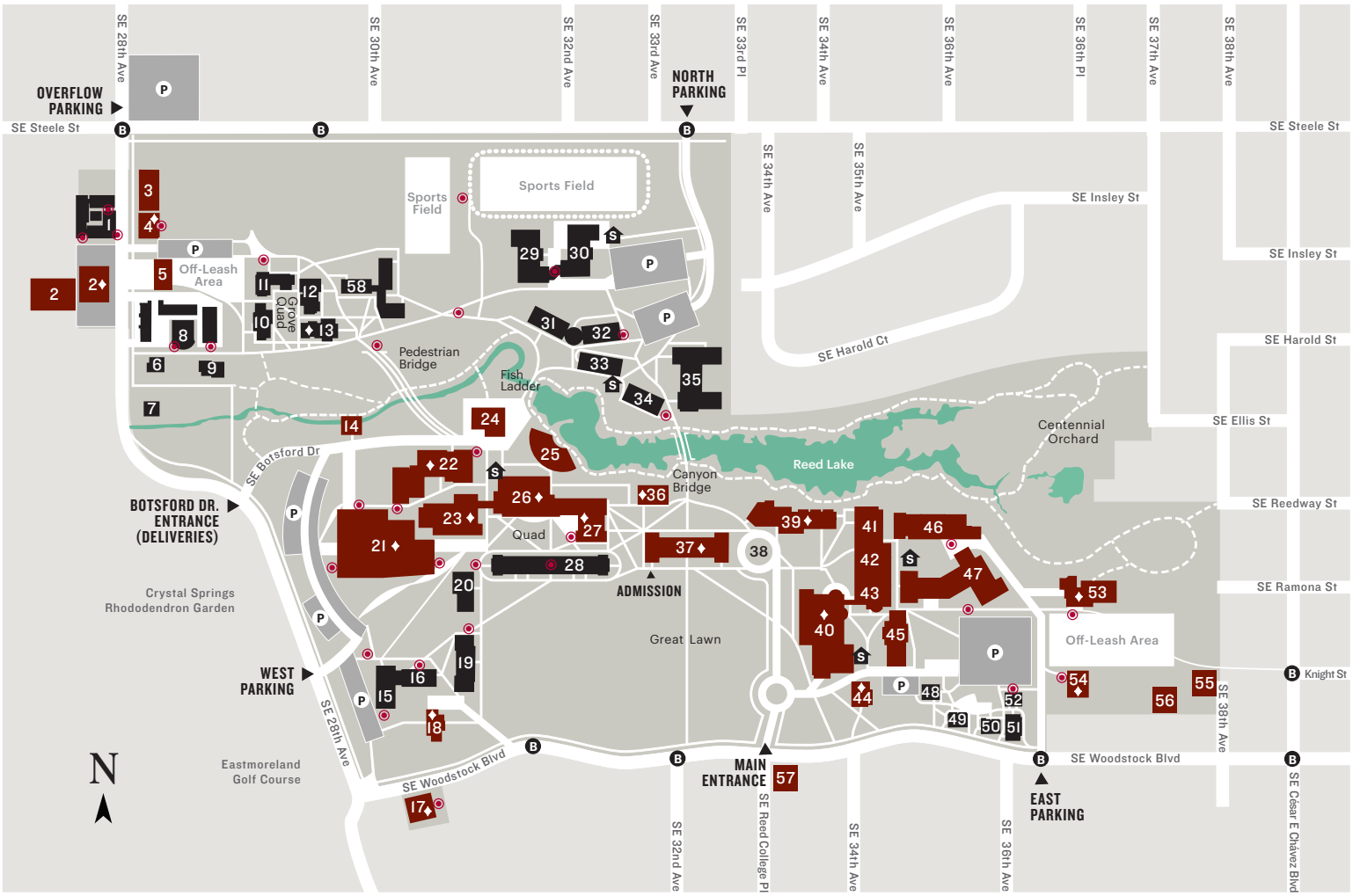

ACADEMIC & ADMINISTRATIVE BUILDINGS

5 28 West: community safety, information, residence life
37 Admission
42 Biology: auditorium
25 Cerf Amphitheatre
46 Chemistry
40 Cooley Art Gallery: in library
54 Dorothy Johansen House: academic support; disability & accessibility resources
45 Educational Technology Center (ETC)
38 Eliot Circle
37 Eliot Hall: admission, chapel, registrar
26 Gray Campus Center: bookstore, commons, mail services, international student services
14 Greenwood: conference & events planning; Greenwood Theatre
44 Greywood: Center for Teaching & Learning
3 Growing Seeds: childcare center
4 Health & Counseling Center
5 Information: at 28 West
23 Kaul Auditorium: Gray lounge
56 Kelly House
40 Library: Cooley Art Gallery
43 Paradox Lost Café
17 Parker House
21 Performing Arts Building: Black Box Theatre, Diver Studio Theatre, Massee Performance Lab
24 Physical Plant
41 Physics
18 Prexy: alumni programs, Center for Life Beyond Reed, fellowships & awards
47 Psychology: auditorium
55 Rees House
22 Sports Center
36 Student Center: student engagement, SEEDS, multicultural resource center
27 Student Union: Paradox Café
53 Studio Art: Feldenheimer Gallery
2 Theatre Annex & Reed Warehouse
57 Willard House
39 Vollum College Center: lecture hall, lounge

RESIDENCE HALLS

20 Anna Mann
13 Aspen House: Canyon Cafe, multipurpose room
12 Bidwell House
1 Birchwood Apartments
35 Bragdon Hall
9 Canyon House
52 Chinese House
34 Chittick
7 Farm House
16 Foster
50 French House
6 Garden House
49 German House
31 Griffin
19 MacNaughton
32 McKinley
29 Naito Hall
28 Old Dorm Block: Winch, Winch social room, Ladd, Quincy, Doyle, Eastport, Westport, Kerr, Abington
8 Reed College Apartments
48 Russian House
15 Scholz
10 Sequoia House
11 Sitka House
51 Spanish House
30 Sullivan Hall
33 Woodbridge
58 Trillium: multipurpose room

CAMPUS INFORMATION

Switchboard
503-771-1112 (24/7)

Admission Office
Mon–Fri, 8:30 a.m.–5 p.m.
503-777-7511

Community Safety Emergency Line
503-788-6666 (24/7)

LEGEND

- Academic Buildings
- Residence Halls
- Walking Path
- Running Path
- Canyon Trail
- Parking Lot
- Bus Stop
- Smoking Shelter
- Emergency Phone
- All Gender Bathroom

For more info, visit the interactive map:
www.reed.edu/map

Directions to Reed College: website and QR code

https://www.reed.edu/getting-to-reed.html

After the fun, please evaluate the symposium!

Please take a moment after the symposium to let us know what you liked, did not like or what you'd like to see in the future! Scan this QR code to provide feedback.

22ND ANNUAL

URBAN ECOLOGY AND CONSERVATION SYMPOSIUM

Held at

Reed College
3203 SE Woodstock Boulevard, USA
Portland, Oregon
March 11, 2024

Organized by the

Urban Ecosystem Research Consortium (UERC)

Many thanks to our partners and sponsors!

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About the Urban Ecosystem Research Consortium (UERC)

Portland, OR - Vancouver, WA Metropolitan Region

What is the UERC?

The UERC is a consortium of people from educational institutions, state and federal agencies, local governments, non-profit organizations, businesses, independent professionals and students, interested in supporting urban ecosystem research and creating an information sharing network to collect, share, and use ecological data in the Portland/Vancouver area. The UERC aims to foster communication and collaboration by offering a forum for professionals to exchange and discuss information regarding urban ecology and its application to relevant field.

The role of the UERC is not to provide a political or advocacy platform.

Mission Statement

To advance the state of the science of urban ecosystems and improve our understanding of them, with a focus on the Portland/Vancouver metropolitan region, by fostering communication and collaboration among researchers, managers and community members at academic institutions, public agencies, local governments, non-profit organizations, and other interested groups.

Goals and Objectives

- Provide direction and support for urban ecosystem research
- Create an information-sharing network within the research community
- Track and house available information
- Promote greater understanding of urban ecosystems and their importance

Organizers

The principal organizers span academic institutions, government agencies (city, regional and federal), and non-profit organizations. The diverse backgrounds and affiliations of those involved have allowed the UERC to bring together many important sectors of the natural resources community.

Website

The UERC website, https://uercportland.org/, includes background and contact information, a link to sign up on the listserv, announcements about upcoming events, and full details about annual UERC symposia, including downloadable proceedings from current and past symposia.

Listserv

Oregon State University hosts a listserv designed for members to share information and facilitate communication among those interested in urban ecology. Anyone can join by going to http://lists.oregonstate.edu/mailman/listinfo/urban-erc; this is also linked from the UERC website.

Lunch and Learns

Based on symposium evaluations, top rated speakers are invited to provide a longer version of their talks.

Urban Ecosystem Research Consortium
Organizing Committee

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2024 Urban Ecology & Conservation Symposium

AGENDA

REED COLLEGE, PORTLAND, OREGON

8:00	**Registration, networking, coffee and snacks**		
9:00	**WELCOME AND INTRODUCTION: Aaron Ramirez, Reed College** Associate Professor, Reed College Biology/Environmental Studies		
9:10	**OPENING KEYNOTE ADDRESS: Mason Fidino, PhD** Quantitative Ecologist, Lincoln Park Zoo, Chicago, IL ***The Urban Wildlife Information Network: a research alliance to increase our understanding of urban environments from local to global scales***		

^ ***indicates presenter is a student***

INVASIVE SPECIES

Moderator: Brendan White, U.S. Fish and Wildlife Service

9:50	Laura Guderyahn	Portland Parks and Recreation	Why is the Oaks Bottom reservoir so dead and brown? A success story of purple loosestrife control
10:00	Vance Kimball^	Oregon State University	Potential impacts of emerald ash borer (*Agrilus planipennis*) on stream shading from riparian plant communities in Pacific Northwest ash-dominated forested wetlands
10:10	Victor Vasquez-Ibarra	Backyard Habitat Certification Program	Emerald ash borer: our community's first response
10:20	Justin Bauer	Mosaic Ecology LLC	The trials and tribulations of grassland restoration on Government Island
10:30	Q&A		

10:40 Break **Raffle at 10:55**

URBAN ECOSYSTEMS

Moderator: Heather Nelson Kent
East Multnomah Soil & Water Conservation District

11:00	Christa von Behren	City of Portland Bureau of Environmental Services	What are those plants doing out there? Developing a protocol to assess natural area function
11:10	Jennifer Morse	Portland State University	Green stormwater infrastructure effects on pollutant retention and water quality
11:20	Hannah Ferguson	Clean Water Services	Exploring environmental DNA as a method for monitoring biological characteristics of surface waters in the Tualatin River watershed
11:30	Jacob Rudolph	Portland State University	Effects of urbanization on dissolved carbon and nutrients in the Johnson Creek watershed on long-term temporal scales
11:40	Q&A		

11:50 **Lunch** *Raffle at 1:05*

You are invited to participate in a facilitated discussion or walking tour during the lunch break. Descriptions of the lunchtime offerings can be found on page 9.

1:10 **AFTERNOON KEYNOTE ADDRESS: Sara Petrita Bombaci, PhD**

Assistant Professor, Department of Fish, Wildlife, and Conservation, Colorado State University

Invisible Injustice, Resilient Communities, and Just Urban Futures

CLIMATE CHANGE

Moderator: Jessica Rojas, Metro Parks and Nature

1:50	Lindsey Babcock^ and Meredith Hastings^	Reed College	Flammability of dominant tree species portends severe wildfire risk in the Portland-Vancouver metro area
2:00	Nanda Ramos	Friends of Tryon Creek	Braiding knowledges for healthy futures for all communities
2:10	Nina Avila and Chelsea Bridges	Hoyt Arboretum Friends	Exploring the layers of science and communities impacted by climate change through the lens of tree health
2:20	Lea Wilson	City of Portland	Supporting private property owners in tree selection for future climate
2:30	Q&A		

2:40 **Break** **Raffle at 2:55**

URBAN WILDLIFE

Moderator: Joe Liebezeit, Bird Alliance of Oregon

3:00	Candace Larson	Bird Alliance of Oregon	Vaux's Swifts in Portland – 15 years of monitoring an iconic bird
3:10	Rodé Krige^	Portland State University	How beaver-damming affects habitat availability for northwestern pond and western painted turtles
3:20	Zuriel van Belle	City of Portland	I love coyotes, but I love my cat too: community-reported emotional responses to *Canis latrans* in the Portland metropolitan area
3:30	Amy van Riessen	North Clackamas Watersheds Council	eDNA study of the Kellogg-Mt. Scott watershed
3:40	**Q&A**		

3:50 **CLOSING REMARKS:** Lori Hennings, Natural Resource Scientist, Metro

4:00 – 6:00 **POSTER SESSION AND SOCIAL with Student Poster Award presented at 5:30**

Poster Presentations

Coordinator: Heather Nelson Kent, West Multnomah SWCD

First author is presenter
^ indicates student presenter

Authors	Title
Gabrielle A. Brown and Crista Gardner, Metro gabrielle.brown@oregonmetro.gov	The Community Choice Grants: a participatory grantmaking pilot at Metro
Gabriel Campbell and Roxy Olsson, Portland State University, Kathryn Ketel, Oregon State University and Kristen Malacara, Portland State University gec2@pdx.edu	Coastal dune plant propagation
Amy Chomowicz, City of Portland amy.chomowicz@portlandoregon.gov	Tryon Creek culvert replacement: bringing salmon back
Clarissa E. Cressotti,^ Portland State University, cressot@pdx.edu	Anthropogenic resistance on occupancy of black-tailed deer (*Odocoileus hemionus columbianus*) and coyote (*Canis latrans*)
Laura Guderyahn,^ Portland State University laura.guderyahn@portlandoregon.gov	Updated occupancy and abundance for northwestern pond turtle and western painted turtle in the lower and middle Willamette watersheds
Matthew V. Guziejka,^ Portland State University guziejka@pdx.edu	Beavers beyond boundaries: perceptions of beaver-related restoration
Grace Hall,^ Portland State University gkh3@pdx.edu	Assessment of avian community structure and habitat connectivity in the Fanno Creek corridor
Michelle Hesek^ and Olyssa Starry, Portland State University mhesek@pdx.edu	Seasonal changes in ecoroof plants and potential effects on runoff and weed establishment
Hannah Kaba^ and Diya Mandyam^, Reed College Corresponding author: Aaron Ramirez, Reed College ramireza@reed.edu	Flammability of dominant tree species portends severe wildfire risk in the Portland-Vancouver metro area

Authors	Title
Tris Kibbey^ and Jennifer L. Morse, Portland State University tkibbey@pdx.edu	Soil biogeochemical changes in response to irrigation with treated wastewater
Anna Mele,^ Portland State University amele@pdx.edu	Using herbarium records to estimate flowering time shifts across bioclimatic regions
Ashley Newcomb,^ Portland State University newcomb5@pdx.edu	Center for Lakes and Reservoirs *Dreissena* mussel and invasive plant survey efforts
Ryan Nord,^ Portland State University jrnord10@gmail.com	Composition, structure, and distribution of Oregon ash-dominated bottomland riparian forests in the Tualatin River Basin - a closer look at these imperiled ecosystems
Suzanne Owen, USDA Forest Service PNW Research Station and Nikhilesh Desai, Urban Forestry, Portland Parks & Recreation suzanne.m.owen@usda.gov	Portland, Oregon's Urban Forest Inventory and Analysis data and applications: example of uneven distribution of trees and benefits
Jacob Daniel Swanson,^ Portland State University jswans2@pdx.edu	Investigating removal as a control method for *Trachemys scripta elegans* and the response of *Chrysemys picta bellii*

Morning Keynote Address

Mason Fidino, PhD
Quantitative Ecologist

Lincoln Park Zoo
Chicago, Illinois

The Urban Wildlife Information Network: a research alliance to increase our understanding of urban environments from local to global scales

How people experience nature is often centered on where they live, and most people live in cities. Yet, access to urban nature is not equally spread among or within cities. To determine how unequal access to nature has ecological consequences, my colleagues and I at the Lincoln Park Zoo started the Urban Wildlife Information Network (UWIN), a large-scale, systematic, and collaborative biodiversity monitoring survey. This talk will provide a broad overview of UWIN, and showcase some of our key results over the last few years with a specific focus on how gentrification, or the process of neighborhood change that includes demographic and economic shifts in historically disinvested neighborhoods, shapes patterns of alpha and beta diversity across cities.

Biography

Mason Fidino is a quantitative ecologist that works in the Conservation & Science department at the Lincoln Park Zoo in Chicago, Illinois. Mason's research, for the most part, is in biodiversity informatics. He integrates large and complex data sources, develops new quantitative techniques, and uses high-performance computing to determine how biodiversity responds to environmental change across multiple spatiotemporal scales. Mason is especially interested in understanding ecological principles in urban environments and, through their research, looks for ways to leverage the vast data sources that exist in cities to answer pressing social-ecological issues.

Afternoon Keynote Address

Sara Petrita Bombaci, PhD
Assistant Professor

Department of Fish, Wildlife, and Conservation
Colorado State University

Invisible Injustice, Resilient Communities, and Just Urban Futures

Urban landscapes present unique conservation opportunities due to their significant biodiversity and rapid expansion over the past century, a trend projected to continue. Shaped by intricate interactions among human activities, infrastructure, and biotic factors, urban ecosystems also reflect legacies of social inequity, resulting in unequal distribution of environmental hazards and benefits impacting both residents and wildlife. Disparities in access and outreach further influence the collection of urban biodiversity data, shaping our comprehension of urban ecology. Emerging research that explicitly considers how social injustice shapes these complex social-ecological systems is offering new insights into urban ecological patterns and processes. In this talk I will share findings from our recent research exploring how systemic biases and social inequities influence biodiversity, access to nature, and ecological understanding in urban environments. I will also discuss asset-based strategies to support just urban futures through culturally responsive approaches that foster collaboration, amplify marginalized voices, and highlight the resilience of marginalized urban communities.

Biography

Sara Bombaci is an Assistant Professor in the Department of Fish, Wildlife, and Conservation Biology at Colorado State University. Her multidisciplinary research blends conservation science and social science to explore how ecological systems interact with social and environmental gradients in pursuit of innovative solutions to conserve biodiversity while meeting diverse human needs. Her current research areas include acoustic ecology, urban ecology, community-centered conservation, and human-wildlife interactions. Dr. Bombaci also has over a decade of experience conducting research, teaching, and outreach to foster greater equity and inclusion in STEM. Dr. Bombaci received both her master's and PhD degrees at Colorado State University. She is a Latina Scientist, an NSF Graduate Research Fellow, Ford Fellow, National Geographic Explorer, and an ESA Excellence in Ecology Scholar.

Lunchtime Discussions

During lunch at the symposium, if you're interested in connecting with fellow conference attendees you will have three options. (1) At the Small Group Discussions, you can enjoy your lunch while engaging in conversations related to the designated topic. The room hosts will be available to answer questions and facilitate discussions if needed. (2) Alternatively, you can enjoy your lunch while watching a screening of the *Follow the Water* film by the Clean Rivers Coalition, followed by a facilitated discussion. (3) Join the Reed Canyon restoration tour to visit and talk about the history of the Canyon.

1. **Small Group Discussions**
    - **Climate Change** hosted by Lori Hennings, Gray Campus Center (GCC) Room A
    - **Community Engagement** hosted by Jessica Rojas, GCC Room B
    - **Finding a Conservation Job** hosted by Erin Abernethy, GCC Room C
    - **Urban Tree Policy and Programs** hosted by Ted Labbe and Theresa Huang, GCC Room D*

2. **Follow the Water Film Screening** hosted by Roy Iwai, Kaul Auditorium

    The Follow the Water film, presented as part of the statewide clean water outreach campaign by the Clean Rivers Coalition, offers a unique perspective on our relationship with water. Through an Indigenous lens, it delves into historical, sociological, and scientific aspects, exploring our collective connection, disconnection, and reconnection to this vital resource. After the film screening, there will be a facilitated discussion where conference attendees can reflect on how the Follow the Water campaign aligns with their work.

3. **Reed Canyon Restoration Tour** hosted by Zac Perry

    Reed Canyon Restoration Tour - Join a guided tour and talk about the history of the Reed Canyon with Zac Perry. See https://www.reed.edu/canyon/ for more information.

* At the Urban Policy and Tree Programs lunchtime discussion, we will discuss a report developed by the Intertwine Alliance and Connecting Canopies which describes urban tree policies and programs across the 42 jurisdictions of the Portland-Vancouver metropolitan region developed over the past 20 years. To learn more about the report, review the findings, and offer input, see this 2-page report summary: https://bit.ly/CC_urb_tree_report. During the lunchtime discussion we will provide a broad overview of these findings and hear your input and feedback.

ABSTRACTS FOR ORAL AND POSTER PRESENTATIONS

^ indicates presenter is a student

Exploring the layers of science and communities impacted by climate change through the lens of tree health

Nina Avila, Hoyt Arboretum Friends, nina@hoytarboretum.org; Chelsea Bridges, Hoyt Arboretum Friends; Joseph Hulbert, Washington State University

Communities of people, places, and organisms can often be defined by common characteristics and the sharing of interests. At Hoyt Arboretum Friends (HAF), different layers of communities are connecting to better understand climate change and its impact on a native tree species, the western redcedar. In the fall of 2023, volunteers of HAF expanded their community science reach into the greater Portland area. In partnership with Western Redcedar Dieback project, HAF volunteers observed 100 individual trees to determine if a connection exists between western redcedar health and average annual temperature. To do so, western redcedar observations were overlaid with the heat map of Portland. These findings will be added to the spring 2024 lesson plan of a plant-based climate change program the HAF education team is piloting in partnership with the US Botanic Garden in Washington D.C. Join this presentation to learn how layers of community are helping to tell a tree story and connect local young people to the natural world. This is just one example of how community science can go far beyond data collection. Explore with us how projects like this encourage communities to broaden their boundaries, develop and strengthen peoples' connections to nature, and represent how science is constantly changing based on new findings and trends.

Keywords: Climate change, Plant ecology, Environmental education

Flammability of dominant tree species portends severe wildfire risk in the Portland-Vancouver metro area

Lindsey Babcock,^ Reed College; Eliza Baker, Anaïs Baker, Kat Benjamin, Sean Brown, Emma Campbell, Gus Compton, Ella Crotty, Alec DeContreras, Kiana Fields, Eva Groeke, Rosan Groot, Meredith Hastings, Rosalie Imbimbo, Jolie Jaffe, Hannah Kaba, Bucky Kuehn, Harper Lethin, Lyda Longfritz, Diya Mandyam, Naia Martin, Nat Michaels, Julian Sarin, Anna Spollen, Joseph Tally, Mariana Tijerina, Alex Vandendries, Catherine Wheaton, and Aaron R. Ramirez (corresponding author), Reed College, ramireza@reed.edu

Climate change increases the occurrence of wildfire globally, largely through enhanced drying of plants which increases their flammability. However, these processes are poorly studied in less fire-prone ecosystems, such as the moist temperate coniferous forests of the Pacific Northwest. Likewise, flammability studies are rarely completed within urban forests. These knowledge gaps limit our ability to appreciate the true fire hazard within our cities and puts our communities at elevated risk of catastrophic wildfires. Recent research at Reed College quantified the shoot-level flammability and tissue moisture of 4 dominant tree species from moist Pacific Northwest forests (*Pseudotsuga menziesii*, *Tsuga heterophylla*, *Thuja plicata*, and *Acer macrophyllum*) and compared it to 4 tree species from more fire-prone dry forest / woodland types (*Pinus ponderosa*, *Calocedrus decurrens*, *Sequioadendron giganteum*, and *Quercus garryana*), using a custom-built flammability chamber. We found that our native moist forest species had higher flammability than dry forest species and that moisture status accurately predicts flammability. Leveraging satellite observations of fuel moisture allowed prediction of seasonal flammability of three local natural areas–Forest Park, Reed Canyon, and the Sandy River Gorge. Our model shows that the Sandy River Gorge reaches critical levels of flammability late in the growing season (August), while Reed Canyon reaches highly flammable levels a month earlier (July), and Forest Park remains highly flammable throughout the growing season. Our study provides important information on the timing of local wildfire hazard and reveals a potentially under-appreciated extreme latent fire risk within our largest urban natural park, Forest Park.

Keywords: Climate change, GIS / modeling, Plant ecology

The trials and tribulations of grassland restoration on Government Island

Justin R. Bauer, Mosaic Ecology LLC, justin@mosaicecology.com

Government Island is a roughly 3.25 square mile island located in the Columbia River northeast of the Portland Airport. Since 2021 Mosaic Ecology has worked with the Port of Portland to rehabilitate a 50-acre restored grassland site that sits just east of the I-205 bridge. The restoration area is a test field for creating future mitigation areas to offset development impacts on nesting bird habitats in nearby areas. Prescribed fire, the most easily recognized grassland management technique, is unavailable due to the constraints of a major freeway and airport. When Mosaic began managing the site invasive vegetation was beginning to overrun the area, including velvet grass (*Holcus lanatus*), Canada thistle (*Cirsium arvense*), and Himalayan blackberry (*Rubus armeniacus*). Coupled with the increase in invasive vegetation, a lack of disturbance has led to an overall reduction of species diversity, homogenization of vegetative size classes, and dense grass cover, all of which reduce the habitat quality for nesting grassland birds. Through a variety of management activities, including herbicide application and mowing, Mosaic staff has worked to "reset" a 25-acre portion of the restoration area, with the intent to reestablish a more resilient grassland community. This presentation will discuss the many logistical hurdles of large-scale restoration on an island, designing plant communities with invasive species management in mind, and the importance of including human initiated disturbance activities in the persistence of diverse grassland systems in the built environment.

Keywords: Habitat restoration, Land use planning, Plant ecology

The Community Choice Grants: a participatory grantmaking pilot at Metro

Gabrielle A. Brown, Metro, gabrielle.brown@oregonmetro.gov; Crista Gardner, Metro

Traditional governmental and institutional funding processes oftener than not reinforce historic power imbalances and inequities. To address this inequity, the Metro Nature in Neighborhoods Community Choice Grants adapted a participatory model to develop a community-centered grant program where community members are the source of project ideas, supported by institutional resources in the development of those ideas, and ultimately decide which investments to fund in their communities. Developed with numerous community touchpoints to allow for engagement and feedback, this program closes the gaps between communities and individuals accustomed to navigating institutional systems and those with less experience to fund projects that reflect the needs and desires of their communities and puts community members first in proposing, developing, and choosing public investments in parks and natural spaces. This presentation will discuss how Metro, in centering environmental justice, racial equity, and climate resilience, adapted a participatory model using community direction to fund parks and natural area grants, the importance of community-driven process and community-centered decision making, and the rewards and risks of participatory processes like the Community Choice Grants. The presentation will also focus on the novel techniques and methods used to engage community in meaningful ways to deliver climate adaptive capital projects. Join us for an exploration of this exciting new program!

Keywords: Climate change, Habitat restoration, Water quality

Coastal dune plant propagation

Gabriel Campbell* and Roxy Olsson^, Portland State University, Kathryn Ketel, Oregon State University and Kristen Malacara^, Portland State University; *corresponding author gec2@pdx.edu

Coastal dunes protect urban infrastructure and provide critical habitat for rare and endangered species. Coastal dunes are threatened by development, climate change, and invasive species. They require active restoration activities including seeding and planting to maintain the ecosystem services they provide. Propagation protocols are lacking for most coastal dune species, limiting their successful use in restoration projects. We propagated several coastal dune species native to the west coast of North America from seeds, cuttings, and divisions, in an urban greenhouse in Portland, Oregon using standard greenhouse and nursery techniques. We recorded propagation success and plant development through production in 48-cell plug liners and 4-inch pots to develop a timeline of plant production and photographed the process over time. The majority of plants tested were easily propagated using standard greenhouse and nursery techniques and were ready for planting within one growing season. Some species were not easily propagated and may require specialized cultivation techniques. Plants grown during this project were distributed to partners for use in restoration projects and photographs were provided to OregonFlora and are available for public view.

Keywords: Conservation biology, Plant ecology, Habitat restoration

Tryon Creek culvert replacement: bringing salmon back

Amy Chomowicz, City of Portland, amy.chomowicz@portlandoregon.gov

The overarching goal of Tryon Creek Culvert Replacement Project is simple: to restore native and wild salmonids and lamprey in the lower Willamette River. The existing Tryon Creek Highway 43 culvert is one-quarter mile upstream from the confluence of Tryon Creek and the Willamette River, and it bars access to vital spawning, rearing, and migratory habitat for all salmon, steelhead, and Pacific Lamprey using the Willamette. The City of Portland and project partner, the United States Army Corps of Engineers, will construct a new, much wider, open bottom culvert that will allow the stream to flow more naturally. The new culvert will also allow threatened and endangered fish passage into the high-quality, cold-water habitat in the upper Tryon Creek watershed. The site poses significant design and construction challenges: construction under a major roadway (Highway 43), two sets of railroad tracks, a main sewer interceptor, and numerous utilities. The site is highly constrained, and access will be a challenge. The approach to permitting and financing may be a model for others who are considering a similar type of project. Replacing the Tryon Creek culvert is one of several stream restoration efforts being implemented along this section of the lower Willamette River. The Tryon Creek Culvert Replacement Project along with the Kellogg Creek culvert project and stream restoration along the Clackamas River will provide miles of restored habitat for salmonids in the lower Willamette.

Keywords: Habitat restoration, Hydrology, Fisheries

Anthropogenic resistance on occupancy of black-tailed deer (*Odocoileus hemionus columbianus*) and coyote (*Canis latrans*)

Clarissa E. Cressotti,^ Portland State University, cressot@pdx.edu

Efforts to restore habitat connectivity in urbanized areas can yield many benefits but also can increase the likelihood and impacts of human-wildlife conflict. Thus, it's important to discern human values that impact behavior towards surroundings, including wildlife and habitat. Using two controversial species (black-tailed deer (*Odocoileus hemionus columbianus*) and coyotes (*Canis latrans*)), we will identify how humans residing near greenspaces can alter wildlife movement through human behaviors attached to their values. Using camera trap data from the Urban Wildlife Information Network (UWIN), we will identify occupancy of black-tailed deer and coyotes over a 49 kilometer transect that spans the city of Portland, Oregon. Cameras are placed a minimum of 610 meters apart in green spaces. Location and placement align with UWIN protocol. A social survey will be conducted amongst homeowners who live near the UWIN cameras. Surveys will gauge the individuals' demographics and opinions on these species to determine their perspective(s) and behaviors carried out for, or against, these species. The Oregon Connectivity Assessment and Mapping Project (OCAMP) indicated best connectivity areas for black-tailed deer and cougar, acting as a surrogate species for coyotes. The three layers will be overlapped on ArcGIS to reveal actual versus expected occupancy of black-tailed deer and coyotes in Portland, Oregon. The resulting data can be applied to connectivity and wildlife management decisions to gauge community perspectives and implications towards connectivity efforts adjacent to greenspaces. Additionally, the data will identify the utility of including human resistance layers that exhibit human perceptions and small-scale landscape alternations.

Keywords: Environmental social sciences, GIS / modeling, Wildlife biology

Exploring environmental DNA as a method for monitoring biological characteristics of surface waters in the Tualatin River watershed

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Environmental DNA (eDNA) refers to DNA shed by organisms into the environment, and can be captured in water, soil or air samples. By identifying DNA captured in a sample, we can infer species present within a given environment. As such, eDNA is a promising tool for understanding spatial and temporal variation in biodiversity across a watershed. Clean Water Services (CWS), a water resource and recovery district serving Washington County, Oregon, discharges to the Tualatin River, a meandering, valley-floor river, sensitive to nutrient inputs and stream flow augmentation. Accordingly, we use macroinvertebrates surveys to monitor the biological characteristics with the watershed as part of our water-shed based NPDES permit. However, macroinvertebrate surveys and the indices used to analyze them are not well suited for river systems like the Tualatin. This results in a lack of resolution of changes in predicted water quality year over year. Given these challenges, we are piloting eDNA as a novel method for gaining detailed biological information. Using a metabarcoding approach, this pilot monitored nine sites representing diverse habitats within the Tualatin River Watershed, on a monthly or quarterly basis. The goal of this phase was to understand spatial and temporal trends in biodiversity between sites, and determine the benefits and limitations of using eDNA metabarcoding analysis. This presentation will encompass preliminary results, ongoing studies, regional partnerships, and plans for future use of eDNA at CWS.

Keywords: Water quality, Habitat assessment

Updated occupancy and abundance for northwestern pond turtle and western painted turtle in the lower and middle Willamette watersheds

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Regional changes in land use and climate are anticipated to have profound effects on the ranges of native freshwater turtles in NW Oregon, so adequate baseline surveys are critical. The Lower and Middle Willamette watersheds are high priority for maintaining the current occupancy and abundance of native turtles as this region represents the only areas where the northern extent of the NW Pond Turtle (*Actinemys marmorata*) range and western extent of the Western Painted Turtle (*Chrysemys picta bellii*) range intersect. Both of Oregon's two native freshwater turtle species are listed as "sensitive-critical" by the State of Oregon and one, *A. marmorata*, has been petitioned for listing under the federal Endangered Species Act. To date, information on the distribution of native freshwater turtles in Oregon has been gathered largely opportunistically through varied surveys ranging from ones at sites of high conservation value to those that are the focus of habitat modeling to predict occupancy based on key habitat variables. To address this deficiency, basking surveys were conducted at 334 aquatic sites throughout 7 counties in NW Oregon from 2021 through 2023 to provide that baseline, as well as a better understanding of the distribution of the widespread exotic turtle, the Red-eared Slider (*Trachemys scripta elegans*). Preliminary comparison to historical survey data was performed to identify changes in distribution both within and outside major urban areas. A current rate of occupancy was also developed for NW Oregon. Further study will focus on identifying key habitat variables that allow for sustainably reproducing populations.

Keywords: Animal ecology, Habitat restoration, Conservation biology

Why is the Oaks Bottom reservoir so dead and brown? A success story of purple loosestrife control

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Ever since the early 1990's, when a water control structure was used to flood the 60-acre ponded wetland at Oaks Bottom to increase waterfowl overwintering habitat, purple loosestrife (*Lythrum salicaria*) has thrived. Starting in 2008, Portland Parks and Recreation (PPR) and the Bureau of Environmental Services (BES) partnered with the Oregon Department of Agriculture (ODA) to annually release thousands of three different species of biocontrol beetles throughout the wetland. However, the unnatural flooding regime due to the water control structure and a greatly undersized culvert connecting the refuge to the Willamette River, resulted in annual reproductive and overwintering failure for the beetles. It wasn't until 2018 when the Army Corps of Engineers, BES and PPR partnered to restore the natural hydrology of the refuge, that the biocontrol was able to take a foothold. Regular monitoring of 5 x 1-meter plots along each of 5 transects throughout the wetland show that in just the 5 years since that tidal restoration project concluded, nearly 100% of the *L. salicaria* has been eradicated. Additionally, the biocontrol beetles can successfully overwinter in the wetland, making future beetle releases unnecessary. While complete eradication of the *L. salicaria* is NOT the ultimate goal for this site, the next 5 years will be a time of great replanting of native trees, shrubs, and emergents to restore this 60 acre wildlife refuge to its former health and floral diversity. To better understand the history of Oaks Bottom, please watch the 30 min documentary "Riverine" at www.youtube.com/watch?v=gQgrq9qf3Ck.

Keywords: Conservation biology, Habitat restoration

Beavers beyond boundaries: perceptions of beaver-related restoration

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This urban-focused research explores the multifaceted aspects of Beaver-Related Restoration (BRR) within the Tualatin River watershed, using a hydro-sociological framework to understand the interconnectedness of water, ecological systems, and societal perceptions. Analyzing social and cultural dimensions associated with BRR, including stakeholder attitudes and potential conflicts, we conducted a voluntary survey at three Tualatin urban watershed study sites (Fanno Creek, Chicken Creek, Springville Creek) during the summer of 2022. Insights from residents' attitudes, perceived impacts, and preferred management strategies revealed a spectrum of opinions. While a majority acknowledged positive beaver impacts on water quality and habitat diversity, some expressed concerns about urban property damage. Notably, support for non-lethal strategies like habitat restoration and education initiatives exceeded that for lethal control methods. Survey data showed a significant correlation between proximity to study sites and positive perceptions, indicating residents closer to sites viewed BRR more favorably. Duration of residency in the study area did not significantly influence perceptions, suggesting factors beyond familiarity shape attitudes in urban contexts. This data provides a foundation for understanding the social landscape around BRR, informing management strategies and identifying challenges and opportunities. These preliminary findings highlight the complexity of human-beaver interactions and the need for comprehensive management strategies that address diverse stakeholder perspectives. By integrating ecological and social perspectives, this research aims to inform sustainable and equitable management strategies that promote harmonious coexistence between humans and beavers in urbanized landscapes.

Keywords: Environmental social sciences, Sustainable development, Hydrology

Assessment of avian community structure and habitat connectivity in the Fanno Creek corridor

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Urbanization can significantly impact habitat quality and connectivity for bird communities, altering individual behavior and decreasing species richness and diversity. In highly fragmented habitats, urban parks and riparian zones can provide important habitat for birds that facilitate movement and access to essential resources. Fanno Creek is a 24-kilometer waterway in southwest Portland, Oregon, that supports a series of parks and natural areas connected by a greenway trail. This riparian corridor provides a unique opportunity for habitat connectivity in the midst of the highly urbanized surrounding environment, and local agencies have conducted over 20 years of management projects to improve its habitat quality. The objective of this research is to examine the avian community structure along the creek and the extent of habitat connectivity for three bird species representative of distinct habitat needs. The Metro Wildlife Habitat Connectivity Assessment Toolkit provides methodology for efficiently examining habitat connectivity in urban environments by using a combination of GIS analysis and in-person assessments. We are following these methods to quantify habitat quality across thirty-four 90,000 meter^2 grid cells in the southern reach of the creek. To ground-truth these scores, we conducted 170 point count surveys across the grid cells and will examine the relationship between the habitat connectivity scores and the species counts using a linear regression. This research will serve as a demonstration of the practical application of the Toolkit for urban bird communities in a small-scale study.

Keywords: Animal ecology, GIS / modeling, Habitat assessment

Seasonal changes in ecoroof plants and potential effects on runoff and weed establishment

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Ecoroof plants remove an abundant amount of stormwater runoff from the combined sewer system in Portland Oregon. Reducing runoff is essential in urbanized cities considering how impervious surfaces promote flooding. While ecoroof research is plentiful on stormwater runoff, there is a limited number of studies that focus on comparing stormwater retention by ecoroof plants. This research aims to study plant growth and seasonal impact on water retention of two commonly used ecoroof plants Buffalograss (*Bouteloua dactyloides*) and White stonecrop (*Sedum album*). Part of this research evaluates weed growth as part of maintenance, which plays a crucial part in plant growth and providing benefits to its full extent. Seven tray structures are built: three planted with Buffalograss, three with White stonecrop, and one containing bare substrate. The trays are monitored to their full plant coverage including biomass, leaf area index, and weed count for a year starting in June 2023. These results are compared to stormwater data collected from tipping buckets by the environmental engineering department at Portland State University. This research aims to provide in-depth data on plant growth and its impact on stormwater runoff. Clients and ecoroof professionals may use this data to strengthen their understanding of two commonly used species and their probable interactions between weeds. Part of the Central City 2035 plan requires ecoroofs on newly built commercial buildings of 20,000 ft^2. Our results aim to understand plant absorption of runoff and use it to our benefit in creating successful ecoroof systems.

Keywords: Plant ecology, Sustainable development

Soil biogeochemical changes in response to irrigation with treated wastewater

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Elevated summer water temperatures in the Tualatin River are a major concern for salmonids and other temperature-sensitive species. One significant heat source is the input effluent from wastewater treatment plants. Clean Water Services, a water utility in Washington County, aims to reduce the amount of heat entering the river by recycling treated wastewater to irrigate restored wetlands near their Wastewater Resource Recovery Facilities. In addition to lessening the amount of heat discharged into receiving waters, irrigation with recycled water could provide ecosystem benefits, such as carbon (C) sequestration, increased biodiversity, and improved habitat quality. On the other hand, recycled water irrigation could have detrimental effects such as increased emissions of greenhouse gases [GHG; carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4)]. In this study, we measured aspects of soil C and nitrogen (N) cycling including soil GHG emissions. My hypothesis is that the wet conditions and elevated N caused by irrigation will increase N_2O emissions but will not become anoxic enough to produce CH_4. The 26-acre project site is irrigated with recycled wastewater at agronomic rates throughout the dry summer months. In 2022 and 2023, we installed four replicate soil chambers in Irrigated and Control areas in three different soil types. Every two weeks, we collected gas samples to estimate fluxes of CO_2, N_2O and CH_4. Preliminary results indicate no significant differences in GHG emissions between control and irrigated sites, likely owing to low rates of irrigation to avoid surface ponding.

Keywords: Climate change, Soil science, Water quality

Potential impacts of emerald ash borer (*Agrilus planipennis*) on stream shading from riparian plant communities in Pacific Northwest ash-dominated forested wetlands

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With the arrival of the emerald ash borer (*Agrilus planipennis*) in the Pacific Northwest, it is suspected that a substantial portion of forested wetlands in the Willamette Valley may transition to scrub-shrub communities with significantly reduced canopy heights. This is due to the expected functional extirpation of Oregon ash (*Fraxinus latifolia*) and a lack of suitable replacement native tree species adapted to the poorly drained clay soils commonly found in low-lying areas throughout the region. Reduced canopy height will presumably influence the amount of stream shading provided by wetland vegetation in riparian communities, which could negatively impact salmonids and other temperature-sensitive aquatic species. We examined how shading in stream-wetland complexes may be affected by a reduction in local canopy height by taking canopy cover measurements at the thalweg and comparing that to the vegetation height from the most recently published LiDAR data. We found that canopy height was moderately correlated with canopy cover over smaller streams (average wetted width of 8.6 ft) with an R^2 of 0.265. These statistical analyses, along with some site-by-site comparisons, indicate that though canopy height is predictive of canopy cover to some extent, it is likely that a mature scrub-shrub community can produce a level of shade comparable to that provided by a forested wetland community for small stream systems.

Keywords: Plant ecology, Water quality, Land/watershed management

How beaver-damming affects habitat availability for northwestern pond and western painted turtles

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Oregon is home to two native freshwater turtle species: the Northwestern pond turtle and the Western painted turtle. Both turtles are Oregon conservation strategy species with a status rating of sensitive, indicating declining populations. Oregon's decline in these turtle's populations is thought to be predominantly due to loss and degradation of habitat that results from development and urbanization. Beavers' ability to dam streams and create ponds may be creating habitat usable by turtles, but the relationship is under-studied. This study assessed water temperature, basking habitat, and overall turtle habitat suitability at beaver-dammed and control ponds in Portland, Oregon. Beaver-dammed ponds had higher average basking habitat and larger temperature heterogeneity than control ponds. Beaver-dammed ponds scored significantly higher on a Turtle Habitat Survey than control ponds. These results provide support for the potential mechanisms behind how the act of beavers damming could create beneficial habitat for native freshwater turtles in Oregon. Suggestions for future research include focusing on all aspects of how beaver-damming could be improving turtle habitat, conducting the Turtle Habitat Survey blind, and attempting the water temperature monitoring portion of the study again. Lessons learned from this project include the trials and tribulations of data collection in an urban setting including: limited access, personal safety, and equipment tampering. Large volumes of water temperature data were lost due to wildlife and human interference. New methods for deploying temperature loggers have been formulated to ensure water temperature loggers can endure being left in ponds for months at a time.

Keywords: Animal ecology, Habitat assessment, Environmental policy

Vaux's Swifts in Portland – 15 years of monitoring an iconic bird

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For 15 year, the Bird Alliance of Oregon (formerly Portland Audubon) has counted migrating Vaux's Swifts at Chapman Elementary School and other sites in the Portland region as part of a community science effort to monitor fall chimney roost site use, safeguard key roosting sites from disturbances, and educate the public on the protection of this species of concern. Data are contributed annually to a larger West Coast wide tracking effort. Vaux's Swift population numbers have been declining for several decades, likely due primarily to habitat loss. This species historically utilized large hollowed out old-growth tree snags to roost. Now, many depend on large chimneys as they make their annual migration back and forth from their wintering grounds in the Neotropics to breeding areas in Northwestern North America. The Chapman chimney is one of the most important fall swift roosting sites on the entire West Coast and therefore is vital to protect. This chimney may host upwards of 160,000 swifts in a given season. During peak migration (mid-September) the chimney has hosted as many as 16,000 birds on a given night. The overall trend of use for this chimney over the 15-year period has remained stable, with an average of slightly over 5,000 swifts per night (Sept. 3-30). This effort has informed our work to educate the public to minimize disturbances to swifts - including by increasing recreational drone use. Along with the swift counts, our SwiftWatch program has provided educational outreach to tens of thousands of members of the public over the years connecting the importance of urban areas for birds and other wildlife.

Keywords: Animal ecology, Conservation biology, Environmental education

Using herbarium records to estimate flowering time shifts across bioclimatic regions

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Over the last 100 years climate change has had an observed effect on plant phenology including flowering time. Many studies have been conducted to show this connection, yet none have examined flowering time changes across multiple bioclimatic regions and on a large geographic scale. We expect that a number of geographic features such as elevation and the proximity of large water bodies might affect the impact of flowering times, but we have little knowledge of the effects of geographic location on changes in plant flowering time due to climate change. We addressed these gaps in our knowledge by mapping herbarium collection records of Ranunculus Occidentalis across a broad geographic range along the West Coast of North America. We assumed that herbarium collection dates provided reasonable estimates of flowering time for each location and date. We estimated two interpolated surfaces based on points from pre 1970 and post 1970, and calculated the difference between the surface to examine location-specific changes in flowering time. We found a variation in flowering time changes from little to no change to several weeks. We are working to add more species to the database to fill in gaps and to provide more accurate estimates of habitat-specific flowering time shifts across Western North America.

Keywords: Climate change, GIS / modeling, Plant ecology

Green stormwater infrastructure effects on pollutant retention and water quality

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In recent decades, green stormwater infrastructure (GSI) has gained prominence in urban planning and environmental management as a way to manage urban flooding, ameliorate water quality issues in receiving waters, and increase human well-being by creating green spaces for aesthetics and recreation. The benefits of peak flow attenuation through the widespread implementation of bioretention structures have been well documented, but the water quality improvements associated with GSI are not as well understood. Here, I report on several related projects in Portland, Oregon, that focused on the role of GSI in processing nitrogen, phosphorus, and metals. In two studies, GSI soils were found to be potentially strong but quite variable nitrogen sinks, while soil phosphorus was vulnerable to release following repeated drying and flooding cycles. A third study focused on GSI impacts on water quality during storms showed that, while concentrations of total suspended solids and most metals decreased from inflow to outflow, concentrations of nitrate and phosphate increased substantially in effluent waters. Together, these results suggest that water quality improvements from GSI are not a foregone conclusion, and that more study of the mechanisms driving the variability of pollutant retention is needed to inform design processes and planning expectations.

Keywords: Land/watershed management, Water quality, Soil science

Center for Lakes and Reservoirs *Dreissena* mussel and invasive plant survey efforts

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Like other invasive species, Dreissinid mussels and introduced aquatic weeds present a threat to biodiversity and ecosystem functions. Zebra mussels (*Dreissena polymorpha*) and Quagga mussels (*D. rostriformis bugensis*) have invaded many countries and much of the United States since their arrival in the Great Lakes. They cause significant economic costs by fouling boat motors, dam structures, etc., causing damage. They also cause environmental damage by filtering significant amounts of algae and nutrients from the water, changing ecosystem structure, sometimes causing cascading environmental issues. The risks of spread by the public have increased statewide, but especially within high boating-pressure areas, including waterbodies by cities. In 2023, Quagga mussels were detected in Idaho within the Snake River, which flows into the Columbia River. In 2021, there were detections of zebra mussels within aquarium moss balls sold in pet stores. The Center for Lakes and Reservoirs (CLR) at Portland State University, alongside other organizations, has increased Portland-area sampling efforts in an attempt to detect these invasive species early. CLR is also increasing sampling efforts and research interests in plant species of concern, such as Spartina sp., and *Nymphoides peltata*. These plants cause shifts in habitat structure, crowd or shade out native plants, and affect water chemistry. Research gaps exist about the effects of *Nymphoides peltata* on water chemistry, the plant community, the macroinvertebrate community, as well as the effectiveness of treatment efforts. Monitoring and research efforts will be conducted to detect and investigate these metrics within the Willamette River system near Eugene, Oregon.

Keywords:Conservation biology, Habitat restoration, Water quality

Composition, structure, and distribution of Oregon ash-dominated bottomland riparian forests in the Tualatin River Basin - a closer look at these imperiled ecosystems

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Over the last two decades, natural resource conservation partners in the Tualatin River watershed have made tremendous progress in restoring and enhancing riparian forests to bolster ecological functions such as stream shading for cooler waters, streambank stabilization for erosion control, and filtering sediments and pollutants to enhance water quality. In bottomland riparian zones of the Pacific Northwest, where low-gradient floodplains support frequent flooding, Oregon ash (*Fraxinus latifolia*) is a dominant overstory tree species and, until recently, a “restoration workhorse” used in revegetation efforts. Unfortunately, Oregon ash is now threatened by the recent introduction of the emerald ash borer (EAB), a wood-boring beetle native to Asia. Natural resource conservation partners are developing strategies to preserve the ecological functions of bottomland riparian forests ahead of the widespread EAB bio-invasion in the Pacific Northwest. However, reference conditions of mature, bottomland riparian forests including the canopy composition and spatial distribution of Oregon ash in Tualatin River basin is not comprehensive. To characterize the reference conditions of mature, bottomland riparian forests and estimate the magnitude of EAB-induced canopy loss, we surveyed the vegetation of eight low-gradient riparian forest stands in over 100 plots along the major tributaries of the Tualatin River in the summer of 2023. Our study attempts to establish a connection between riparian canopy species diversity and lateral distance from a stream, share the promising method of quantifying canopy cover and composition with a smartphone, and address the implications for management actions in our threatened forests.

Keywords: Habitat assessment, Land/watershed management, Plant ecology

Portland, Oregon's urban forest inventory and analysis data and applications: example of uneven distribution of trees and benefits

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Portland, Oregon's Urban Forest Inventory and Analysis (Urban FIA) data from 2018 to 2021, revealed an estimated 2.6 million live trees (≥ 5.0 inches in diameter) across public and private lands. Trees in Portland stored about 1.6 million tons of carbon and removed about 639 tons of air pollution per year. However, urban forests and their benefits to human health are not evenly distributed throughout the city. Urban FIA data was parsed into the City of Portland, Bureau of Transportation's Equity Matrix categories, which assigns scores based on measures of race, ethnicity, and income. Areas with Portland's least disadvantaged communities contained about 54% of the city's trees, which contributed to about 56% pollution removal, whereas areas with Portland's most disadvantaged communities contained only 1% of the city's trees, which contributed to about 3% pollution removal. This example represents a small fraction of publicly available urban FIA data. Urban FIA data is collected every year across all land ownerships, and together with applications, such as My City's Trees, can help managers monitor changes in urban forests over time and support policy decisions to improve environmental quality and human health in Portland.

Keywords: Air quality, Environmental policy, Environmental social sciences

Braiding knowledges for healthy futures for all communities

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Founded in 1970 by park neighbors, Friends of Tryon Creek, a nonprofit, focuses on preserving Tryon Canyon. Partnering with Oregon State Parks, their mission aims to inspire communities to reconnect with nature in the urban forest. In 2021, the organization revamped its mission, vision, and strategic plan to enhance community engagement. Acknowledging historical exclusions, especially for BIPOC communities, the group commits to internal changes, prioritizing BIPOC leadership and dismantling traditional organizational models. Tryon Creek State Natural Area, covering 20% of the watershed, provides vital urban habitat. Over 70% of the staff and board represent marginalized identities. Proactive measures, like the BIPOC-focused Tryon Ecology Adventures camp, address barriers and offer a cultural lens on ecology. Community engagement involves volunteers welcoming 10,000 visitors, and educational programs, including Tryon Forest Adventures, reach 600 youth, fostering a deeper connection to nature. The Green Leaders program and Tappin Roots Internship Program provide hands-on experience, engaging students in education, restoration, and community programs. The internships focus on green jobs, environmental justice, traditional ecological knowledge, and implicit bias in the environment, fostering inclusivity and diversity within the organization. Intentional and land tending guided by TEK and revitalizing culture through the re-introduction of cultural fire. These efforts demonstrate a commitment to restoring Tryon Creek's ecological health while creating an inclusive, diverse, and equitable space for community engagement with the natural environment.

Keywords: Air quality, Animal ecology, Climate change

Effects of urbanization on dissolved carbon and nutrients in the Johnson Creek watershed on long-term temporal scales

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Dissolved organic carbon (DOC), the largest flux of carbon in streams, is a vital metric in urban stream ecology that is often overlooked, especially on seasonal scales. Microorganisms metabolize DOC, which can decrease dissolved oxygen and pH and harm other aquatic species. Johnson Creek watershed, located in the Portland metro area, provides an ideal location to study the effect of urbanization on DOC and water quality resulting from channelization and urban land. We hypothesize that DOC will increase downstream as impervious surface cover and urbanization increase. To quantify DOC concentration temporal changes, surface water samples were collected weekly from three locations in Johnson Creek that were co-located with USGS gaging stations and Eureka multiparameter sondes fitted with fluorescent dissolved organic matter sensors. From July to November 2023, we found a significant 3-fold decrease in dissolved organic carbon (DOC) concentrations between the upper two locations (Regner Road and Sycamore) and the lower sensor site at Milwaukie from ~3-4 to ~1 mg L^1, and an opposite pattern in total dissolved nitrogen (TDN) concentrations, which increased significantly from upstream to downstream. These changes occurred as imperviousness and developed land cover increased downstream, suggesting an urban effect on water chemistry in Johnson Creek. Further, Crystal Springs Creek in the lower Johnson Creek watershed has values of DOC and TDN similar to the Milwaukie site, likely indicating a point source of increased nitrogen in Johnson Creek. Ongoing sampling will shed further light on these longitudinal and seasonal patterns in urban stream C and N chemistry.

Keywords: Water quality, Hydrology, GIS / modeling

Investigating removal as a control method for *Trachemys scripta* elegans and the response of *Chrysemys picta bellii*

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The red-eared slider (*Trachemys scripta elegans*) is considered one of the most ubiquitous freshwater turtles globally due to human-mediated introductions into novel environments. Several key ecological advantages and life history traits of this species jointly impact growth rates and survivorship of native freshwater turtles where sympatry occurs. Evaluation of current management outcomes for *T. scripta elegans* is limited, resulting in a paucity of information to guide management for the species and conservation of declining native freshwater turtles. Further, well-intentioned but under-researched management methodologies can have negative repercussions (e.g., hydra effect, overcompensation), exacerbating the impact of introduced species. Here, we used capture-recapture and removal sampling data from prior managed sites with sympatric populations of *T. scripta* elegans and native western painted turtles (*Chrysemys picta bellii*) to examine the effects of control (trapping and removal) of *T. scripta elegans*. Population models were created to statistically infer abundance estimates for both species at two sites in Portland, Oregon to answer the following questions: (1) Do current management actions for *T. scripta elegans* decrease the species abundance? (2) What is the response of *C. picta bellii* to the removal of *T. scripta elegans*? Our findings can help guide further management of introduced *T. scripta elegans*.

Keywords: Wildlife biology, Conservation biology, Animal ecology

I love coyotes, but I love my cat too: community-reported emotional responses to *Canis latrans* in the Portland metropolitan area

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In an urban setting, coyote (*Canis latrans*) observations elicit a variety of reported emotional responses—including complex combinations, such as concern for humans and pets with love for nature and wildlife. The Portland Urban Coyote Project is a community science project that collects reported observations of coyotes in the Portland metropolitan area and provides outreach materials to the community. Since 2013, the project has collected over 16,000 reported observations of coyotes. In 2021, the report form was updated to include the question "How did you feel about this observation?" with a 5-point Likert scale from very negative to very positive or unsure. An open-ended follow-up question asked for an explanation of the rating; we coded these responses into common themes. Analysis of 3,245 sightings revealed that more people (43.1%) felt positive about observing a coyote than negative (33.5%) or neutral (23.5%). The most common theme (36.8%) across coyote observations was seeing coyotes as a threat to humans, pets, or other animals. The second most common theme (24.7%) was a love for nature, wildlife, or coyotes in particular. Most observations (85.4%) had one central theme; however, some observations (14.6%) demonstrated significant nuance with at least two major themes—sometimes with considerable tension between the themes. Feelings about coyote observations were generally the same from residents living in different areas of the Portland metro. We discuss how understanding these tensions, differences, and nuances helps inform wildlife management research and outreach materials.

Keywords: Environmental social sciences, Environmental education, Wildlife biology

eDNA study of the Kellogg-Mt. Scott watershed

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The Kellogg Creek Restoration and Community Enhancement Project is an exciting effort occurring in the heart of downtown Milwaukie. The project encompasses many elements, including: providing fish passage to 15 miles of habitat by removing the barrier at Kellogg Dam, restoring 17 acres of high-quality habitat behind the dam, providing public access and viewing points to encourage nature-based recreation and outdoor education, increasing flood storage capacity to reduce flooding in lower Kellogg Creek, modernizing the existing Oregon State Highway 99E bridge with an alternative that increases seismic resiliency and establishes a safe bike/pedestrian undercrossing, interactive learning, scientific research and real-world laboratory opportunities for student involvement and community science engaging the community through cross-cultural communication tools and events. As a part of the pre-project research, the North Clackamas Watersheds Council conducted an eDNA study to better understand fish access past the dam and look at seasonal and geographic utilization of the watershed by salmonids and Pacific lamprey. We also looked for the presence of western pond and painted turtles in the impoundment. This information will provide pre-construction baseline data, and help inform the Council's protection and restoration efforts throughout the watershed. Collection of eDNA is noninvasive and biological information can be obtained without handling organisms and disturbing their ecosystems. It is also a new and innovative tool in urban environments where private properties are small and permission to access multiple properties would be necessary for biological surveys such as snorkeling and electrofishing.

Keywords: Conservation biology, Fisheries, Habitat restoration

Emerald ash borer: our community's first response

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When natural resource (NR) threats like Emerald Ash Borer (EAB) come to regions it is not uncommon for events to pass through underserved and vulnerable communities unbeknownst. For many communities, the lack of awareness is due to barriers like language access, non-prioritization of information sharing, or other life priorities. Before long, the impacts are realized with little understanding as to why or how, bringing greater disparity. Proactively working first with underserved and vulnerable communities helps dismantle barriers that delay awareness of threats like EAB and will empower people to prepare, respond, and build resiliency for future NR issues. One such community is Centro Cultural who has provided services and safe spaces for Latinos in Washington County for over 50 years. Centro also has several ash trees that provide great community value and losing these trees will have severe impacts on all who need Centro. To avoid severe impacts, Centro teamed up with Backyard Habitat Certification Program, Tualatin Soil and Water Conservation District, and Oregon Department of Forestry to develop a 6-month paid work-learn experience for Centro's Climate Youth Justice program. A series of workshops were developed to introduce EAB, inventory methods, and management strategies to students so they may have the tools to develop a management plan unique to the community's view and needs. You will hear from the partners and students in hopes that their effort may serve as a framework for other NR professionals and underserved communities to come together and proactively address EAB and future threats.

Keywords: Animal ecology, Environmental education, Habitat assessment

What are those plants doing out there? Developing a protocol to assess natural area function

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The Revegetation Program at the Bureau of Environmental Services aims to use a resilience-based adaptive management approach to steward natural areas, but we have lacked an adequate monitoring protocol to effectively implement this approach. We spent three years developing a functional assessment protocol to assess progress toward management goals and to infer performance of different ecological functions. Our goal was to create a protocol to evaluate progress toward multiple goals across habitat types, be quick enough to fit into busy schedules, and detailed enough to see change over time. We developed the functional assessment over three years from 2019 through 2021; we reviewed other assessment protocols, researched and brainstormed metrics for different ecosystem functions, developed mapping protocols, and tested different data collection apps. We considered appropriate sample sizes, randomization, and levels of precision and accuracy. Unique aspects of our functional assessment include a tree vine rating system, consideration of vegetation structure and species richness independent of species origin, and assessment of the potential for stewardship and collection by Indigenous community members. During the field seasons of 2020 and 2021 we field tested and fine-tuned the functional assessment protocol, paying particular attention to ease of use and repeatability. The first data were collected using the protocol in summer of 2022. Initial findings from the first two years of data collection will be presented, along with lessons learned in the creation of a new monitoring protocol.

Keywords: Habitat assessment, Plant ecology, Habitat restoration

Supporting private property owners in tree selection for future climate

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Collectively, trees on private property provide broad watershed and human health benefits. The planting and maintenance of these trees, however, is reliant on the knowledge, resources, and stewardship ethics of a multitude of individual property owners. At the same time, climate change will both threaten these existing trees and necessitate a shift in the planting palette of future trees. We use a municipal tree planting program in Portland, OR (Treebate) as a case study for understanding how property owners value, select, and care for their trees. We found that while many property owners claim to have considered future climate in tree selection, a review of the species planted indicates reason for concern about whether these trees will in fact thrive in the future. We explore opportunities individual-scale, public-facing stewardship programs, like Treebate, to support the personal agency of property owners while also contributing to a more climate-resilient urban forest.

Keywords: Climate change, Land/watershed management, Environmental social sciences

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