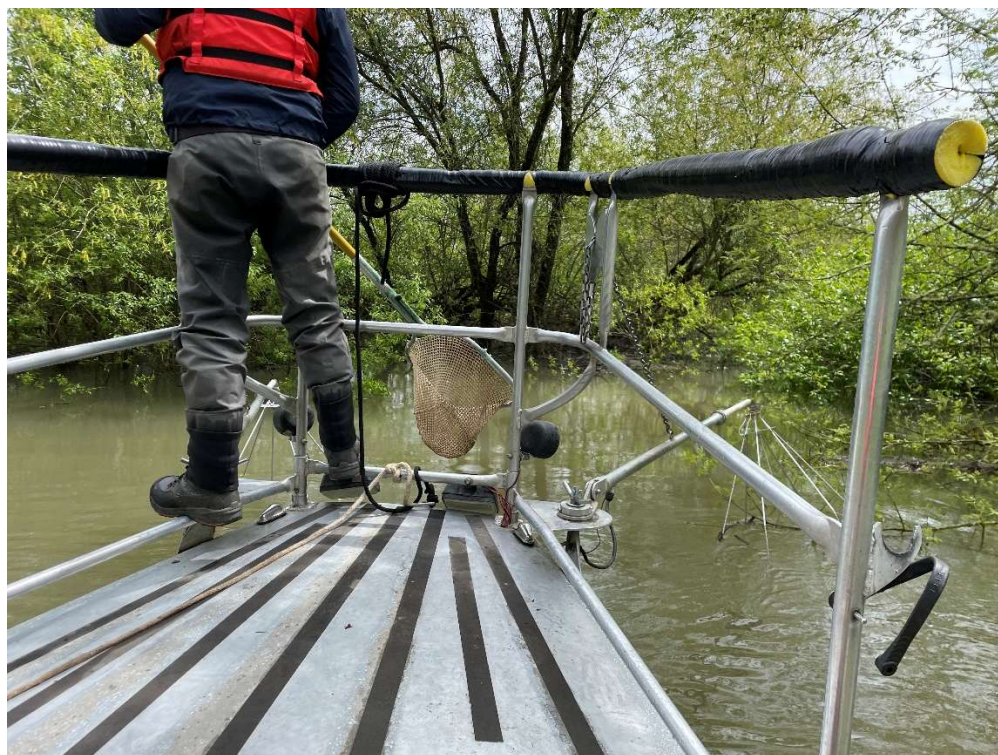


Nature Trails

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The Eugene Natural History Society is based out of the traditional homelands of the Kalapuya peoples, most of whom are citizens of the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz Indians. These Indigenous people stewarded this land for millennia and continue to play an active role in local communities. We commit to supporting the many Tribes and Indigenous scholars and organizations working to shape the future of these lands and waters that we mutually cherish.



Netting for fish with the boat electrofisher. *Brooke Penaluna*

Willamette River Fishes: Thriving, Striving, or Nose-diving?

Brooke Penaluna

Research Fish Biologist
Pacific Northwest Research Station, U.S. Forest Service, Corvallis

Friday, 18 September 2026, 7:00 pm

This month's meeting will be a hybrid of in person and real-time Zoom. The in-person lecture will be held at 7:00 in 221 Allen Hall, University of Oregon campus. The Zoom lecture link is <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09> or see our website at <https://eugenenaturalhistorysociety.org/>

This Month's Speaker: Brooke Penaluna



Dr. Brooke Penaluna loves fishes. In her words “If there isn’t a fish in the story, it’s not a story I’m going to tell.” Brooke came to her passion via a nonconventional path. She grew up in landlocked Waterloo, Iowa, home of the John Deere tractor company. Her mother is an artist, and her father is a businessman. Even though neither are scientists, Brooke credits them with her combination of creativity and practicality. Her career as a fisheries biologist is rooted in her love of water. She began competitive swimming at age 6, a sport she continued through college. She has always wanted to be in or around water and sought out a career connected to water. Fish biology was an obvious road forward.

Brooke received her B.A. degree in environmental studies from the University of St. Thomas in St. Paul, Minnesota, with an emphasis in biology. Her first job after graduation brought her to Oregon. She worked for the Oregon Department of Fish and Wildlife at a winter steelhead facility on lower Canyon Creek, a tributary of the South Umpqua River. She lived in a trailer outside the facility and cared for steelhead smolts until they were released at 3 months of age. Although she has worked with other charismatic animals such as wolves, the experience of rearing baby steelhead became formative.

Brooke pressed forward with her career aspirations by applying for graduate school at Western Washington University in Bellingham. There she studied estuarine habitat use by baby Chinook salmon. Although the main story of her thesis eventually centered on the spiny dogfish who also inhabited the estuaries, her love for salmonids intensified. She left the United States for southern

Chile, where she spent 4 years working with Dr. Doris Soto studying the effects of escaped farmed salmon on native Chilean fishes. This work produced a host of publications, and it was there that she met and married her husband.

Brooke returned to Oregon and entered the Ph.D. program at Oregon State University. Her research centered on the effects of forest harvest and climate change on coastal cutthroat trout on the northern Oregon coast. Following her Ph.D., she began her current position as a Research Fish Biologist with the U.S. Forest Service at the Pacific Northwest Research Station. Much of her current work remains focused on coastal cutthroat trout at H. J. Andrews Experimental Forest (HJA), where she is now Lead Scientist.

Brooke’s work continues to expand. She now uses environmental DNA (eDNA) to assess aquatic biodiversity. With modern sequencing technology, researchers can identify various species from bits of their DNA suspended in a water sample. Those who will hear her speak this month will find out what she does as the lead researcher for the Willamette River Fishes Decadal Study. This project was founded by Dr. Stan Gregory and first ran from 2011 to 2013 with the ambitious goal of documenting the Willamette River fish community and relationships between native and nonnative fishes. Brooke assumed leadership of the project in 2020, just prior to the 2021–2023 sampling cycle. In addition to replicating the protocols established by Gregory when the study began, Brooke has expanded the project to include eDNA and water quality variables. Sampling is set to run again from 2031–2033, and she plans to add a survey of macroinvertebrates.

The impact Brooke Penaluna has made on our knowledge of regional fisheries biology is extraordinary. Her stated goal is to “understand the ecological linkages among water, land, and people.” Over 90 publications include her as either first author or a coauthor, and many of them pertain to the ecology of fishes in the Pacific Northwest. Her influence is magnified by leadership positions on research teams at HJA and on the Willamette River. Although she is conversant in the sophisticated sampling and analytical tools available to modern ecologists, Brooke takes seriously her role in public outreach. Having spent some time splashing in a creek and interviewing her about the interactions between coastal cutthroat trout and coastal giant salamander larvae at HJA, I can attest to her enthusiasm and excellent communication skills. The Eugene Natural History Society is fortunate to host her as our first speaker for the 2026–2027 lecture season.

Dr. Brooke Penaluna will present “Willamette River Fishes: Thriving, Striving, or Nose-diving?” Following is a summary of her presentation in her own words:

Major declines in native biodiversity are occurring globally. Although these patterns are well documented in marine or terrestrial ecosystems, studies in large rivers are uncommon, regularly focus on only a few freshwater species, and often rely on inconsistent methods. We used consistent methods and data collected 10 years apart to compare the abundance and richness of 41 native and nonnative fishes along the Willamette River. Our findings revealed a decline in abundance of native fishes that was outpaced by an increase in numbers and diversity of nonnative fishes, especially downriver. Biogeographic patterns suggest that the greatest decline for native backwater fishes occurred downriver, whereas the greatest decline for small cold-stream native fishes was upriver. Sixty percent of individual native species declined in abundance or apparent occupancy between the decades. River-wide declines in both abundance and apparent occupancy were noted for the Cascadian sucker (*Catostomus bondi*, part of the mountain sucker complex). Our

results suggest a transition in the river assemblage, with an emerging ecological shift and spatial differences between upriver and downriver reaches. We found decadal shifts in biodiversity; warmer temperatures and increases in nonnative fishes are the likely drivers for declines in native fishes. These spatial and temporal differences in the fish community underscore the need to identify underlying causes of change and to conserve native biodiversity.

Join us on 18 September at 7 p.m. in Allen Hall on the University of Oregon campus for what is sure to be an excellent talk on our local fish fauna. Admission is always free, and cookies will be provided! We can't make the cookies available digitally, but if you are unable to attend in person, join us on Zoom at

<https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUeJuU2lwT20rdz09> or from our website at <https://eugenenaturalhistorysociety.org/>

—Tom Titus

FIELD TRIP: Saturday, 19 September. Brooke will introduce us to the fishes of Green Island, courtesy of the McKenzie River Trust. For more info, see the box in the calendar section below.

Sailing Through the Air by Reida Kimmel

We live in the narrowest part of Fox Hollow Valley where in summer it is extremely windy. Often the gusts and gales seem like our own private winds. To the north, the forested cliff across the road is calm. The big Douglas-firs are not even swaying while we endure gusty blasts. I hate the winds and this deathly dry summer. Our two creeks were dry by the end of June, and the pond is almost dry, too.

But outdoors I often witnessed most wondrous sights. Western Tiger Swallowtail butterflies kept soaring by, coming from the screen of water-loving hardwoods growing along our creeks and roadside, moving, floating, often quite swiftly, toward our house and garden. The butterflies did not even fight the wind nor did they necessarily go in its direction; high in the air at first, then lower, moving easily despite the wind. And finally these very large butterflies landed at chosen favorite sites. Ignoring our native flowers, the Tiger Swallowtails single-mindedly sipped delicious nectars from alien *Verbena bonariensis* and phlox.

The mystery of how these fragile insects could power their way through strong winds made me decide to try to find out what makes butterflies work. What did they evolve from? What is their life cycle? Are Swallowtails especially different from other smaller butterfly species?

The first flying insects developed approximately 300 million years ago. Looking like today's dragonflies and damselflies, these ancestors attained huge wing spans and hunted in Pangaea's oxygen-rich warm swamps. Chewing mouth parts or a proboscis let them feed on fern spores, pollen, and the sugary excretions of gymnosperms. These insects were only very remotely ancestral to today's butterflies and moths, but Jurassic fossils, over 190 million years old, show evidence of moth-like scales and wings. Ancestral moths and other insects had developed the ability to fold back their wings, a trait dragonflies never developed.

In the evolution of butterflies, moths came first and were nocturnal, profiting from the proliferation of flowering plants. Butterflies, though almost exclusively diurnal, evolved from a specialized ancient small moth lineage. Like moths, butterflies took advantage of the evolution of flowering plants. Usually more brightly colored than moths, butterflies are superficially quite different. Moths have a plump, furry aspect and sport feathery or plain thread-like antennae. Butterflies have long thin antennae with clubbed ends and a sleeker, thinner body shape.

Papilio rutulus, the Western Tiger Swallowtail butterfly, is our state insect. Remarkably large, with wingspans of up to 4 inches, it has been described as a creature of waterways, frequenting the woodlands fringing rivers and streams. Willow, ash, alder,

maple, and cottonwood species are essential habitat. There, female Tiger Swallowtails lay their eggs and the caterpillars feed. Egg laying season lasts from early spring to early September, with chrysalises overwintering in much of the butterfly's extensive range from Southern California to British Columbia. A female will lay up to 100 eggs, each separately, on the undersides of leaves. The small shiny green eggs hatch in about 4 days, and after an early instar stage that looks like brown bird poop, they become green caterpillars with two eye spots and other more delicate spots. Preferring to feed at night close to where they hatched, the caterpillars grow, shedding their exoskeletons five more times in a period of 3–4 weeks. Atypically, the coloration of each new Swallowtail instar is only slightly different. The caterpillars have one very interesting defense mechanism, the osmeterium, a repulsively smelly orange organ behind their heads that can be everted and inflated when the caterpillar feels threatened.



"Bird poop" first instar of the Tiger Swallowtail caterpillar.
Stan Malcolm

When ready to pupate, the Swallowtail caterpillar forms a chrysalis, a hard shiny covering over its

The Wind in the Trees by Whitey Lueck

Many people are aware of the apparent effect of strong winds on trees that grow along the coast and on exposed ridges in the high mountains. The trunks of trees in these locations that sometimes experience severe weather may be strongly slanted or bent, and the crowns or canopies are often very asymmetrical. But few people realize that even where relatively gentle weather prevails most of the time, such as here in the upper Willamette Valley, wind can cause significant crown deformation in both native and cultivated trees.

Trees at the coast and in the mountains are not deformed due to the wind per se. At the coast, for example, the strongest winds occur in the wintertime as storms arrive from the Pacific Ocean, generally from the southwest. But tree canopies there are deformed as if a wind from the northwest were acting

body, attached by the tail in a perpendicular position and secured by a silken belt around the middle. Although butterflies have silk glands in their mouths, they do not spin silken cocoons. Moths spin cocoons and often wrap themselves in an additional blanket of leaves.

In 10–20 days, the adult Tiger Swallowtails emerge. Doomed to live only 6–14 days, they dedicate themselves to producing the next generation. Their beauty in the eyes of the beholder is just a happy accident. Even the lovely wing tails that I assumed would help in navigation serve only as distractions to predators that might nip the intriguing tail tip while the butterfly floats away safely. Males and females look very similar, and behavior is the best way to identify the sexes. Males are puddlers; they will drink from mud puddles and slurp up minerals from the wet soil. They also patrol the hillsides, searching the skies for mates. Females prefer to cling to the woods where they will lay their eggs. Females do not drink water; they survive on plant nectar alone.

I never did solve the mystery of Tiger Swallowtail flight, but I have clues. Large broad wings help them to move and maneuver. Gliders, not flappers, they float away from the trees. Somehow, perhaps when the gusts abate, they return to the shelter of the riparian forest, which is their true home. I never had the patience to devote a day to a butterfly, but there's always next year, and maybe less wind, more lovely clouds, and showers. Dream on.

For amazing photos of the life cycle of Tiger Swallowtails, see <https://www.performance-vision.com/TigerSwallowtail/index-2011.htm>

on them! How can that be? What causes the deformation of coastal tree canopies is not the wind itself but the salt that is carried on the wind—which kills the tissues, buds, and leaves or needles on the windward side of the tree.

During the winter, storms off the ocean are accompanied by rain, which washes any salt off. But during the dry summer, the strong north-northwest winds that blow almost daily along Oregon's coast deposit salt on the northwest sides of trees, and this salt does not get washed off, resulting in the southeast side of the tree (out of reach of the salt) growing more luxuriantly than the northwest side, over time creating the lopsided canopy.

In the mountains, the effects on trees are similar. However, there it is a wintertime phenomenon, and what causes the crown deformation is not salt but blowing snow, ice, and abrasive volcanic materials,

all of which kill tissues, buds, and needles on the windward side of the tree and create an asymmetrical canopy.

Okay, back to the Willamette Valley. Here in the Eugene-Springfield area, part of what makes our summers so exceedingly pleasant—compared with many other parts of the state and country—is that even when it's occasionally very hot we almost always benefit from a strong diurnal wind that develops by midmorning on most days and lasts until about sunset.

Because this is a growing-season wind and it occurs over a period of many weeks, it affects the canopy development of many (but not all) species of trees growing here. For example, broad-leaved trees tend to be more affected than are conifers, and some species of broad-leaved trees are much more affected than others.

Some members of the magnolia family—e.g., saucer magnolia (*Magnolia × soulangeana*) and tulip-tree (*Liriodendron tulipifera*)—are particularly vulnerable to crown deformation. So are London plane-trees (*Platanus × acerifolia*). The pink-flowered and frequently planted 'Kwanzan' cultivar of Japanese flowering cherry (*Prunus serrulata*) is also very susceptible.

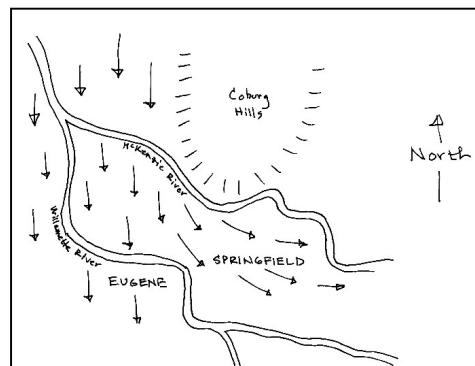
The two oak species native to this area—Oregon white oak (*Quercus garryana*) and California black oak (*Quercus kelloggii*)—respond very differently. The former is never deformed by these strong daytime winds; the latter almost always is, exhibiting both a leaning trunk and a deformed crown.

Perhaps understandably, the most deformed trees are found in the most exposed locations where the daily winds are strongest. Such trees can be at the north edge of town—adjacent to open fields, across which the wind can really rip—or in downtown “canyons,” in parks with extensive open areas (e.g., Amazon Park), or in large parking lots. Conversely, the crowns of trees growing in courtyards or in heavily treed neighborhoods tend to be relatively unaffected by the wind.

The direction in which affected trees lean can tell us a lot about wind patterns in and around the area. In Eugene, the diurnal summer winds are out of the north, and affected trees lean due south. But as one heads east in the metropolitan area toward the Cascades, prevailing wind direction shifts by 90 degrees!

This is especially evident as one drives eastbound from Eugene along the I-105 freeway and Highway 126. West of the I-5 interchange, while still in Eugene, all affected trees lean to the south. But soon after crossing I-5 into Springfield, tree canopies begin tilting a little bit to the east of south, then

toward the southeast, then east-southeast, and finally due east—all in a matter of just a few miles! Why is this? Two reasons: 1) here in the upper Willamette Valley the north wind is confined to the valley by the Coburg Hills on the east side, and as soon as the wind gets past these hills, it is able to fan out toward the east; and 2) the McKenzie River Valley has its own up-valley diurnal wind that is “sucking” air out of the Willamette Valley west of it.



Prevailing direction of diurnal summer winds in the Eugene-Springfield area, as indicated by crown deformation in “wind-deformed” tree species.

This phenomenon is especially noticeable in giant sequoias (*Sequoiadendron giganteum*)—whose pointed and narrowly conical silhouettes are a common feature throughout the metro area. In Eugene, a sequoia growing on an exposed site (i.e., unprotected from the wind by buildings or other trees) has a canopy that is largely unaffected by the wind but a trunk that tilts noticeably to the south. The tree's trunk did not grow up vertically and then tilt; rather, the tilt has been acquired continuously throughout the life of the tree. If a large building is built to the north of an existing sequoia that has a tilted trunk, all the new trunk growth of the sequoia will be vertical, because the physical force causing the tilt up to that point (i.e., the north wind) has now been eliminated.



A typical “tilting” giant sequoia on an exposed site in Eugene, Oregon. The summertime diurnal wind is blowing from the north (left) to the south (right).

Two outstanding examples of this phenomenon are the giant sequoia planted by the Class of 1880—and arguably the oldest sequoia in the area—on the campus of the University of Oregon. It's located near the southwest corner of the Miller Theatre Complex.

The other example is a sequoia located on private property but very visible to passersby on the west side of Amazon Parkway between East 24th Avenue and East 24th Place.

So keep your eyes open as you explore the Eugene-Springfield area and look for the effect of wind on the trees—and not just the giant sequoias. Again, not all species are affected by our strong summer winds, and trees growing in the most

exposed areas show more dramatic effects than do those of the same species that grow in more protected areas. Finally, remember that the “bad” wind that is strong and frequent enough to deform the crowns of some local trees is at the same time the “good” wind that makes warm and sometimes hot summer days here especially pleasant for human beings.

Important Member Information

Membership Renewal This Month

Annual dues for ENHS membership are payable in September. Keep your copies of *NT* coming and support our efforts to provide fascinating natural history presentations every month and occasional field trips. Anyone not renewing by 6 November will no longer receive *NT*. A pre-addressed envelope is enclosed with this issue for your convenience. You can also renew and pay electronically at <https://eugenenaturalhistorysociety.org/join/annual-membership-payment/>.

Please Update Your Email Address

This year, we will be sending all ENHS members electronic versions of *NT* via email, even if you have requested a paper copy (which you will still receive). Please be sure that we have you most up-to-date email address. If you have questions, contact Treasurer Judi Horstmann (horstmann529@comcast.net).

Join Us on the Upcoming Field Trip

This month's speaker, Brooke Penaluna, will introduce us to some of the fishes of the Willamette River at Green Island on Saturday, 19 September, the day after her presentation. Meet at 9am at the NE corner of the South Eugene High School parking lot to carpool or at 10am at the Green Island gate: 31594 Green Island Rd, Eugene. If you think you might attend, please fill out the online MRT liability waiver: <https://mckenzieiver.org/liability-waiver/>. Bring water and appropriate clothes for walking. Rain or shine.

Volunteers needed for ENHS booth at the Mt. Pisgah Arboretum Mushroom Festival Sunday, 25 October, 10am–5pm

See announcement in the calendar below. No experience necessary; you will be paired with a trained volunteer. Booth sitting is a great way to learn interesting things and meet interesting people! We usually work in 3-hour shifts, but other time slots are possible. Contact Judi Horstmann (horstmann529@comcast.net).

Upcoming Events

(for complete listings and details, see individual websites)

- **McKenzie River Trust** <https://mckenzieiver.org/events/#event-listings> or 541-345-2799
 - Second Saturdays, 8am–4pm. Living River Exploration Day at Green Island.** We open the gates to this conservation area and welcome our community to explore this special place. Free, no preregistration.
 - Friday, 11 Sept., 10am–4pm. Finn Rock Reach Rafting Trip.** No rafting experience needed. Sign up through the River House Outdoor Center, City of Eugene.
 - Saturday, 12 Sept., 9–11am. hatch ikt'at'uu Neighbor Tour, Florence, Oregon.** A chance to see the site, hear from the people who helped implement the project, and talk together about what comes next.
 - Wednesdays, 9–11:30am. Watershed Wednesdays at Green Island.** Beginning 30 Sept. Volunteer projects include invasive species removal, habitat care, planting, and tree establishment. [Sign up](#)
 - First Fridays at the Willamette Confluence.** Beginning 2 Oct. Work may include bending, clipping, digging, lifting, and walking on uneven ground. Tools provided.
 - Saturday, 17 Oct., 8–10am. Green Island Photography Walk.** Join photographer GariRae for a guided photography walk through the riparian woodlands. Preregister.
- **Native Plant Society of Oregon, Emerald Chapter** <https://emerald.npsoregon.org/>
 - Saturday, 19 Sept., 9:30–11:30am. Volunteer Outreach.** Westmoreland Park wetlands enhancement work party. Westmoreland Park, 1545 W. 22nd Ave., Eugene.

Monday, 21 Sept., 7–9pm. Research Flash Talks from University of Oregon Graduate Students. Monkeyflower Evolution, Compost Amendments, and Conservation in Southwest Oregon Oak Woodlands. Amazon Community Center, 2700 Hilyard St., Eugene.

Monday, 19 Oct., 7–9pm. Ethical Foraging of Native Plants. Presenter: Steve Yeager. Amazon Community Center, 2700 Hilyard St., Eugene.

- **Mt. Pisgah Arboretum** <https://mountpisgaharboretum.com> or 541-747-3817.

Sunday, 20 Sept., 10am–noon. Insect Tour. With Karen Richards. Registration limited to 18.

Saturday, 10 Oct., 10am–noon. Wonderful World of Trees Tour. With Byan Ribelin. Registration limited to 18.

Sunday, 11 Oct., 8–11:30am. Bird Tour. With Julia Soporin and Mieko Aoki. Registration limited to 18.

Sunday, 25 Oct., 10am–5pm. 2026 Mushroom Festival. Attendance is limited; tickets go on sale 25 Sept.

- **Coast to Cascades Bird Alliance** www.laneaudubon.org or 541-485-BIRD; maeveanddick@q.com or 541-343-8664

Saturday, 19 Sept., 8–11am. Third Saturday Bird Walk. Everyone welcome. For meeting info, check the website.

Tuesday, 22 Sept., 7–8:30pm. Beaked Whales. Presenter: Robert Pitman. Zoom and in person, Campbell Community Center, 155 High St., Eugene.

Saturday, 3 Oct., 8–11am. First Saturday Bird Walk. Everyone welcome. Contact Sarah at

1satbirdwalks@ccbirdalliance.org

- **Museum of Natural and Cultural History, University of Oregon** <https://mnch.uoregon.edu/museum-home>
Ongoing exhibits: Oregon—Where Past Is Present; Explore Oregon; America at 250: Before, Between, and Beyond (through Mar. 2027); The Buzz About Bees (through Jan. 2027)

- **Nearby Nature** <https://www.nearbynature.org/> or 541-687-9699, 622 Day Island Rd., Eugene (Alton Baker Park)

Monday, Wednesday, Friday mornings. Wonder Keepers. Preschool program outdoors in our Learscape.

Tuesday and/or Friday afternoons. Natural Neighbors. After-school program outdoors in our Learscape.

Tuesday, 13 Oct., 10–11:30am. Green Start Play Day: Hide Outside. In our Learscape Register online.

Friday, 16 Oct., 5:30–9pm. Haunted Hike. Celebrate night creatures in Alton Baker Park. Registration begins in Sept.

- **Friends of Buford Park** <https://www.bufordpark.org/>

Thursday, 24 Sept., 6:30–8:30pm. Annual Meeting and Fall Fundraiser. Food, beverages, and silent auction to support ongoing conservation efforts. Keynote speaker: Bart Johnson. Saint Thomas Episcopal Church, 1465 Coburg Rd., Eugene.

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Fill out the form or go to our website (see QR code below) to join and pay by check or electronically. Membership payments allow us to give modest honoraria to our speakers and pay for the printing and mailing of *Nature Trails*. Find us at:

<http://eugenenaturalhistorysociety.org/>

and

https://www.youtube.com/channel/UCERYzVh9lw9y-nLS_t94BVw



Eugene Natural History Society
P.O. Box 5494
Eugene, OR 97405

Monthly meetings:

When: September–May: third Friday; December:
second Friday

Where: 221 Allen Hall (UO campus) and/or on
Zoom at

<https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUeJuU2lwT20rdz09>

Time: 7:00 pm

Parking for UO events is available at the UO

Physical Plant lot: From Franklin, turn north onto
Onyx, go 1 block to the lot. After 6pm, it's open to
the public.

See our website for more details.

<http://eugenenaturalhistorysociety.org/>

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Wagner (emeritus)

2026–2027 Speakers and Topics

18 Sept.	Brooke Penaluna	Willamette River Fishes: Thriving, Striving, or Nose-diving?
16 Oct.	Michael Palmer	Bug Hunting at the McKenzie Valley Bug Lab
20 Nov.	Kayla Fratt	Remote Scentsing: Using Detection Dogs and Satellite Imagery to Understand Alaska's Island Wolves
11 Dec.	Nolan Clements	A 50-Year Snapshot of Change in Oregon Coast Range Bird Communities (cosponsored with the Coast to Cascades Bird Alliance)
15 Jan.	Alex Nyers	What Obsidian Can Tell Us
19 Feb.	Leif Karlstrom	Giant Aquifer of the Cascades
19 Mar.	Desirée Tullos	Klamath River Dam Removal: What's Next
16 Apr.	Stephanie Hazen	Backyard Butterflies and Conservation (cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)
21 May	Erin Pettit	Thwaites Glacier, Antarctica