

# Nature Trails

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The Eugene Natural History Society is based out of the traditional homelands of the Kalapuya peoples who stewarded this land for millennia. Today most Kalapuya people are citizens of the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz Indians and continue to play an active role in local communities and in the stewardship of this land.



Palmer Station, Antarctica. *John Postlethwait*

## An Icefish Is a Nice Fish

**John Postlethwait**

**Institute of Neuroscience, University of Oregon, Eugene**

**Friday, 19 January 2024, 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 our new time and room: 7:00 in 221 Allen Hall, University of Oregon campus.** The Zoom lecture link is <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU2lwT20rdz09> or see our website at <https://eugenenaturalhistorysociety.org/>

## This Month's Speaker: John Postlethwait



John Postlethwait last spoke to us in October 2008. His topic then? Icefish. This month we'll hear what he's learned about these unique animals in the 15+ years since that talk. He has made the trek to Palmer Station, Antarctica five times. Each trip lasted 4 to 6 weeks. Getting there takes at least 10 days. One return trip took 17 days because of extreme weather. Rough seas made it necessary for the ship to stay in the lee of an island for at least a week. The crew kept moving the ship in little circles to keep ice from forming and hemming them in. In typical fashion, John finished this harrowing tale by saying, "It was fun."

John Postlethwait was born in Maine, while his dad was serving in the Navy in WWII. He grew up in West Lafayette, Indiana, where his family had settled after his father became a member of the Agronomy faculty at Purdue University. John said that he has always been interested in science, and he was implicitly encouraged by the examples of both his father, a botanist, and his mother, an excellent amateur naturalist and artist. It helped that they lived next to a forest, where he and his brother spent uncounted hours.

John got his BS degree in biology at Purdue in 1966. While an undergraduate, he took an embryology course and thought it was great. Then he took genetics and decided *it* was great. His fascination with these two areas led to his career path: developmental genetics. John began

his teaching career as an assistant in general biology in 1964 while still an undergraduate. He taught that same course for 55 years, until 2019.

For graduate study, John attended Case Western Reserve University in Cleveland, Ohio, where there was a small but excellent group studying developmental genetics. He worked on a fruit fly mutant in which antennae had been replaced with legs. The gene mutation responsible for this change has a human counterpart that is critical for brain development. Just when John was getting into his thesis research, his advisor accepted a position at the University of California at Irvine and moved his entire lab, John included, from Ohio to California. Although John's PhD degree is from Case Western, most of his graduate research was done at UC Irvine.

While John was in the finishing stages at Irvine, his advisor alerted him to a job opening at the University of Oregon. He had already seen Oregon during a family vacation 10 years before and had been struck by its grandeur. He came to Eugene for the interview and was hosted by Chuck Kimmel (yes, our own Chuck Kimmel), who took him, among other places, to the top of Spencer Butte. Along the trail, John was struck by the beauty of tiny calypso orchids, at the top he marveled at the view, and in the end he fell in love with Eugene. The UO offered, John accepted, and in 1971 he took the position he still holds.

Shortly after becoming a Duck, John got a Career Development Award from the National Institutes of Health (NIH), which covered his salary and research expenses for 5 years and reduced his teaching and committee assignments, allowing him time to develop his research program. This period was capped by a year at the Austrian Academy of Sciences, where he, his wife Nita, and their two children lived with a farm family in an idyllic setting. John ran from home to work and back every day for a year—4 miles each way.

Besides becoming one of the best in the world in his research field, John continues an illustrious career as an endurance athlete. Some of his fellow runners questioned his motivation for his first trip to Antarctica. Was it really to learn about icefish, or was it just an excuse to

allow him to fulfill his goal of completing a marathon on every continent on earth? Hmm.



John during the inaugural Icefish Marathon, Palmer Glacier, Antarctica

Some of us have switched from bait fishing to fly fishing over our lifetimes. John's conversion was almost as difficult; he went from fly research to fish research. After 17 years of using fruit flies as his research organism, he moved to zebrafish. Chuck Kimmel had created several zebrafish mutants, and John used his fly experience to develop a genetic map of zebrafish, enabling researchers to locate the mutated genes. John's publication list testifies to the complete success of his rejuvenation. Of his over 400 publications, 15 are on Antarctic fishes, and of those, 9 deal with icefishes. Many of his articles appear in the most prestigious journals of his field. Ninety-nine articles have been cited 99 or more times. NIH and the National Science Foundation have supported his lab throughout both the fly and fish parts of his career. He just got his latest NIH grant, which will provide funding for 4 years (by which time he will be 83 years old).

I asked John whether he had ever eaten an icefish in Antarctica. He said no, but not for lack of trying. A large icefish that wasn't needed for research was given to the cook to fix for dinner. The cook placed the fish on the grill, closed the cover, and left it to bake. (Now, you need to know that icefish are extraordinarily fatty. They live on the ocean floor, about 200 meters down, but their major food sources are much higher in

the water column. Being so fat means they are quite buoyant, so they can get up to their food without expending much energy.) About 4 pm, the station's fire alarm sounded. This was a big deal: a fire there could mean no shelter in an unforgiving climate. Everyone headed outside and feverishly sought the cause of the alarm. It was in the kitchen. Fat from the icefish had drained into the bottom of the hot covered grill. The fat caught fire, generating an explosion. Flying bits of flaming fish were flung to the far corners of the room, and the smoke from the burning fat set off the alarm. Experts doused the flames, but there wasn't enough left of the icefish for a meal.

Here is a teaser from John:

When Antarctica chilled to below the freezing point of body tissues, most of the continent's fish fauna became extinct. One lineage, however, evolved an antifreeze protein and survived. This group, called notothenioids, diversified to constitute about 95% of the biomass of Southern Ocean fishes. Within this group are the Antarctic icefishes, the only animals with backbones that lack red blood cells and don't have the oxygen-transporting red pigment hemoglobin. How do these animals survive such profound anemia? What tradeoffs have made their survival possible? What might happen to Antarctic fishes in the near future as glaciers melt and seawater warms due to global climate change?

Please make every effort to attend Professor John Postlethwait's lecture "An Icefish Is a Nice Fish" at 7:00 pm on 19 January 2024 in room 221 Allen Hall on the University of Oregon Campus. He has a great story to tell and some stunning images and exciting videos to share. Spread the word, bring a friend.

John Carter

This Zoom lecture can be accessed at <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09>

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## Sting

by August Jackson

Hot. A dry heat infused with juniper, dust, and sagebrush wafting over the landscape despite the stillness of the air in the canyon bottom cauldron. At the height of summer this campground has been abandoned for cooler

options further up the mountain (we were just there; it's lovely), and the place is empty at the moment as I wait to welcome field trip participants. Amy and I look for a campsite amidst sparse junipers, triangulating the position of shade at the hottest part of the day, which is

still a few hours off. I'm working now, but Amy is still on vacation and would like to pass the time left in a reasonable amount of comfort. Here, at least, we don't have to worry about mosquitoes.

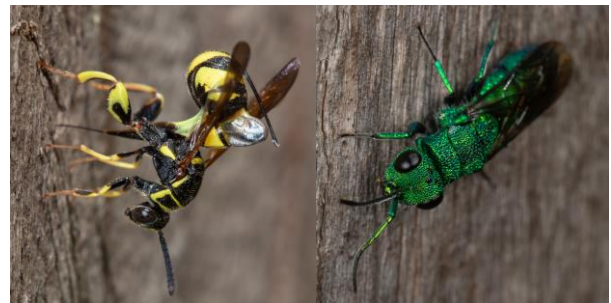
Hot. A wet and spreading heat pulsating from the fleshy pad at the base of my thumb. An involuntary and unfilterable string of curse words pours out as I vigorously shake my hand, dance around a bit, and then crumple to my knees in the gravel as the pain worsens. While taking a look around campsite 2, I had placed a hand on my hip and smothered a wasp. Minding her own business. But on *my* hip. The pain is the most severe I've felt from a sting, and I'm not without experience. With the numbing help of an ice cube, the pain eases more quickly than expected and with none of the swelling or itching that accompanies a yellowjacket sting. I didn't get a look at who stung me, but I have my suspicions.

The late entomologist Justin Schmidt famously developed a sting pain index as a means of comparing sting intensity to test hypotheses about the development of sociality in Hymenoptera (wasps, bees, and ants). Although the pain level is simply ranked on an ascending scale from 1 to 4, the descriptions of each sting are a joy to read, like tasting notes for fine wines. Of a sting from a sweat bee in the genus *Lasioglossum*, Schmidt writes "light, ephemeral, almost fruity. A tiny spark has singed a single hair on your arm." Unsurprisingly, this sweat bee merits a rank of only 1, and although I wouldn't be so generous as to describe the sting as "fruity," all of my stings from various sweat bees have been mild, with the pain receding as quickly as it arrived. That pain, like all pain, is relative, and Schmidt went out of his way to put the sting of a sweat bee in context. Of a top-ranked tarantula hawk species, he wrote "A bolt out of the heavens. Lie down and scream."

The stinging Hymenoptera are derived from a single common ancestor and form a monophyletic clade known as the Aculeata, which includes a relatively small percentage of wasps but all bees and ants. In these aculeates, the ovipositor (egg-laying organ) has been modified into a stinger that is utilized in hunting and/or defense, and the mechanism for laying eggs has been relegated to a small opening at the

base of the stinger. Extraordinary modifications to the ovipositor can be found in other wasps, but all are for specialized egg-laying purposes. The chalcid wasps, for example, are a highly diverse group with specialized ovipositors modified for the parasitization of their preferred hosts.

*Leucopsis affinis* has a drill-tipped ovipositor for boring into wood and laying eggs inside the nests of mason bees (*Osmia* spp.). However, she must compete with a jewel wasp in the genus *Chrysura* that similarly parasitizes the nests of mason bees. Possessing a stinger, the jewel wasp cannot remain outside her host's nest but must sneak inside to lay eggs, a behavior known as cleptoparasitism. If she is discovered, the stinger becomes a useful defense.



*L. affinis* (left), *Chrysura* (right). A. Jackson

The stinger is a remarkable tool, allowing the ancestrally parasitic wasps (of which an estimated several hundred thousand species remain to be described) to diversify into a multitude of hunting forms including eventually the bees. In other words, the evolution of the stinger is foundational to the development of modern agriculture, which is reliant on bees for the pollination of a significant portion of crops and on the hunting wasps for pest control. Clearly the bees no longer use their stingers for hunting (and most hardly use them at all), but their closest relatives remain keen hunters of other invertebrates. The stingers of hunting wasps range in size and potency according to their prey, which may be aphids, caterpillars, grasshoppers, flies, spiders, or even bees. These hunting wasps do not kill their prey, allowing their larvae to complete that task, but paralyze them with neurotoxic peptides injected through the stinger, enabling the prey to be flown or dragged back to the nest. The aforementioned tarantula hawks are wasps specialized for hunting the large arachnids. With venom potent enough to paralyze prey so large and dangerous,

it is little surprise that tarantula hawks possess some of the most painful stings.



Tarantula hawk. A. Jackson

To be stung by a hunting wasp is to be very unlucky or very motivated. Nearly all insect stings in our area come from a handful of social species in just two families: the Vespidae (yellowjackets and paper wasps) and the Apidae (honey bees and bumble bees). Although hunting wasp stings are meant to incapacitate other invertebrates, the stings of many social species are meant for us and animals like us. In fact, one theory is that the development of the sting was a necessary precursor to the evolution of sociality in the Hymenoptera, enabling them to defend the abundant resources gathered within a colony. Although typically not ranking among the most painful (still very painful!), the venom cocktail

injected by these social species does more damage to our bodies, causing localized or systemic allergic reactions occasionally resulting in anaphylaxis. The intensity of that reaction and the aggressiveness with which a species defends a colony seem to correlate with how significant a resource they are defending.

When I was stung in the campground, my experience told me I was stung by a hunting wasp. The pain was memorable, but my body was not provoked into an immune response. I do not react well to yellowjacket stings, which are a little less painful but cause a great deal of swelling and send occasional electric zaps from the sting location (remember, these are neurotoxins) followed by a couple of days of itching. Amy's youngest sister, now in college, still affectionately calls me "baby hands"—a nickname earned from the puffy extremities I used to serve tea to her and her friends at her 9th birthday party hours after taking a few yellowjacket stings to the hands. I've been stung by over 20 species at this point, and although I have little interest in developing a greater palette, I have gained an appreciation for the sting as an evolutionary marvel and an appreciation for how distinct venoms interact with the body. It tempers the pain.

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### **OSU's Master Naturalist Program Offers Ecological Insights to Everyone (Yes, Even to Creative Writing Professors)** by Melissa Hart

As a student in Oregon State University's Master Naturalist program (<https://extension.oregonstate.edu/mn>), I was supposed to be following Dr. David G. Lewis across a muddy field near Salem to study examples of *wapato* (broadleaf arrowhead, *Sagittaria latifolia*)—once an important food staple for indigenous people in the area and lately regenerated thanks to partnerships between indigenous scholars such as Lewis and local farmers who've committed to rewilding wetland habitat. But a flash of lime-green catapulted over the toes of my Bogs, and I dropped to the muck on both knees to glimpse a Pacific tree frog disappearing into a clump of forbs.

As an Oregon resident these past 22 years, I've been madly in love with the state's flora and fauna. But my degrees are in literature and

creative writing, and I work as a journalist and creative writing professor. After my husband and I adopted our daughter as a toddler from the foster care system, I had no time to earn a degree in biology. I learned just enough about my surroundings to volunteer as an environmental educator in a racoon costume for Nearby Nature and later for the Cascades Raptor Center with a great-horned owl on my glove.

Still, I practically salivated every time I came across a description of the Master Naturalist class offered as part of OSU's Professional and Continuing Education Program. This course is a year-long hybrid that covers watersheds and wetlands, native and invasive plants, primary characteristics of Oregon's nine distinctive ecoregions, land use issues, forest politics, and—my favorite part—insight into the state's mammals and birds and trees and plants and amphibians and invertebrates.

At last, my daughter turned 16 and began driving herself to school and dance classes, and I had time to register for the program.

“But what are you going to do with the certificate?” friends asked me.

“It’s not the certificate that’s important,” I told them. “I want to learn about the world around me.”

Too, I wanted to learn in the company of like-minded adults who thrilled to the pale flash of a bald eagle’s head in a Douglas-fir tree and teared up at the sight of kingfisher babies in a field and dropped to their knees around me in a farmer’s newly restored wetland to study what turned out to be *thousands* of Pacific tree frogs living adjacent to the wapato plants.

My fellow Master Naturalist students proved to be thoughtful, mindful companions ranging in age from 20-something to 60-something—people who shared my ardent curiosity and sense of wonder. Some had a solid background in ecology or botany or biology; others, like me, knew just enough to be a pain in the ass to friends hoping for an aerobic hike up a mountain without stopping to exclaim over orange spot jelly fungus on a damp log and bizarre scat formations and songbirds identified courtesy of [Merlin’s avian ID app](#). I needed adventure partners who would put up with my passions. I found them in this program.

Jason O’Brien coordinates the program, drawing on his expertise in community science and in wildlife. He oversees an 8-week online course packed with text, photos, videos, and Zoom lectures with guest instructors. As a layperson, I particularly loved his wealth of interactive apps and websites. I learned about my watershed and its environmental issues courtesy of the EPA’s [“How’s My Waterway.”](#) I adored the RiverRunner app, which dramatized the journey between a drop of water down my sink and its northern trajectory to Amazon Creek and the Willamette and Columbia Rivers before heading out to the Pacific.

Students check in weekly with one another and with O’Brien on thought-provoking discussion topics. Proficiency in the online portion of the course is demonstrated with a final exam. But for me, the real fun began with 3 days of field research in the spring and fall.

In and around Salem’s public parks and wetlands last spring, we learned from botanists and birders and park rangers and professors and land stewards. We studied native plant restoration in Salem’s riverfront park and explored Mary’s Peak to look for newts and admire one of the finest examples of pillow basalt in the country. In the fall, we studied bird migration and pondered white oaks and camas and white-breasted nuthatches in Minto Brown Park. We learned from Dr. Lewis about wapato regeneration as part of a return to indigenous land stewardship.

Still, I blanched at the thought of our 6-hour capstone presentation. It’s difficult for me to sit still for an *hour*; not even the promise of a gourmet lunch could comfort me. But from the moment the first student began her presentation, displaying stunningly illustrated nature journals, I was hooked. Almost 30 students presented on their particular passion that day, and every single lecture proved fascinating.

A Corvallis-area pilot showed a PowerPoint presentation illustrating the problem of bird strikes at airports. A woman passed around beautiful baskets she’d woven out of pine needles. A teacher showed photos of the outdoor school she founded with a friend. My friend Amy gave a photo-illustrated talk on species of Oregon orchids. One hilarious presentation instructed us on the merits of the composting toilets at Smith Rock State Park in comparison to traditional port-a-potties. Six hours flew by.

The final component of the program is 40 volunteer hours with a group focused on natural resources. Considering my teaching background, I signed up to guide walks for school kids at Mt. Pisgah and found myself with yet another group of nature-loving friends.

The Master Naturalist program gives students a solid sense of the environmental groups working to preserve wilderness in this state. It asks us to consider ecological concerns associated with global warming. Best of all, it fosters connections with students who span three generations—people who share a passion for learning and volunteering outdoors in all kinds of weather to leave our little corner of the world a little better than we found it.

## Upcoming Events

(for complete listings and details, see individual websites)

- **McKenzie River Trust** <https://mckenzieriver.org/events/#event-listings> or 541-345-2799  
**Wednesdays, 9–11:30am. Watershed Wednesdays at Green Island.** Projects include invasive species removal, habitat care, planting, and tree establishment. [Sign up](#)
- **Native Plant Society of Oregon, Emerald Chapter** <https://emerald.npsoregon.org/>  
**Monday, 15 Jan., 7–9pm. Ancient Grasslands.** Presenter: Bart Johnson, UO. Sustaining and restoring vegetation mosaics that include oak-pine savanna could be a key to both regional biodiversity conservation and reducing the risk of catastrophic fires. In person at Amazon Community Center Main Hall, 2700 Hilyard St., Eugene.  
**Saturday, 10 Feb., 1–3pm. Winter Plant Walk** with Gail Baker and Steven Yeager. Mt Pisgah Arboretum.  
**Monday, 19 Feb., 7–9pm. Updates on Holoparasitic Orobanchaceae in Oregon.** Presenters: Dr. Alison Colwell, Center for Plant Diversity, UC Davis and Dr. Adam Schneider, University of Wisconsin–LaCrosse. In person at Amazon Community Center Main Hall, 2700 Hilyard St., Eugene.
- **Mt. Pisgah Arboretum** <https://mountpisgaharboretum.com/festivals-events> or [541-747-3817](tel:541-747-3817). All tours meet at the MPA Education Building. Don't forget your parking pass. \$5, free for MPA members. Limited enrollment. Preregister.  
**Sunday, 14 Jan., 9–11:30am. Monthly Bird Tour** with Mieko Aoki and Julia Siporin. All levels of experience welcome. Please bring binoculars.  
**Friday, 19 Jan., 10am–noon. Winter Mushroom Tour** with August Jackson.  
**Saturday, 27 Jan., 10–11:30am. New Member Tour** with Leisha Wood.  
**Sunday, 28 Jan., 10am–noon. Family Tour: Water and Snow** with Sara Spoden.
- **Lane County Audubon Society** [www.laneaudubon.org](http://www.laneaudubon.org) or 541-485-BIRD; maeveanddick@q.com or 541-343-8664  
**Saturday, 20 Jan., 8–11am. Third Saturday Bird Walk.** For more info see the website.  
**Saturday, 20 Jan., 9:30am and 2pm. Two Midwinter Eagle Counts.** First at Dorena Reservoir and then at Cottage Grove Reservoir. Contact Grace Fowler-Gore, 817-975-4936 or [GraceLovesBirds1@gmail.com](mailto:GraceLovesBirds1@gmail.com).  
**Tuesday, 23 Jan., 7pm. Borneo, Vignettes of a Vanishing World.** Presenter: Magnus Persmark. Zoom and in person at the Campbell Center, 155 High St., Eugene.
- **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 Learnscape.  
**Tuesdays and/or Fridays afternoons. Natural Neighbors.** After-school program outdoors in our Learnscape.
- **Museum of Natural and Cultural History, University of Oregon** <https://mnch.uoregon.edu/museum-home>  
**Ongoing exhibits:** Oregon—Where Past Is Present; Explore Oregon; Underwater Forests—Oregon's Kelp Ecosystems.  
**Thursday, 25 Jan., 2–3:30pm. Film screening: “Land/Trust” (2022).** This film documents the effort to restore the coastal prairie in the Quiroste Valley Cultural Preserve at Año Nuevo State Park in California. Discussion to follow with Alexii Signona, UC Berkeley and Ruth Anne Beutler, UC Santa Cruz.
- **Friends of Buford Park and Mt. Pisgah** <https://www.bufordpark.org/> or 541-344-8450. See the website for more info.
- **WREN (Willamette Resources and Educational Network)** <https://wewetlands.org> See the website for programs and information.

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<http://eugenenaturalhistorysociety.org/>  
and

[https://www.youtube.com/channel/UCERyzVh9lw9y-nLS\\_t94BVw](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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*Nature Trails* editor: Kim Wollter [kwollter@comcast.net](mailto:kwollter@comcast.net)

**2023–2024 Speakers and Topics**

**19 Jan. John Postlethwait**

**An Icefish Is a Nice Fish**

**16 Feb. Ryan Tucker-Jones**

**Soviet Whaling and the Environmental History of the Pacific**

**15 Mar. Ron Larson**

**Natural History of Lake Abert**

**19 Apr. Lincoln Best**

**Plants and Pollinators**

(cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)

**17 May Marli Miller**

**Amazing Geologic Sites in Oregon**