

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 the Kalapuya people are largely 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.



Body Types and Hormone Levels in Salamanders

Nancy L. Staub

Department of Biology, Gonzaga University, Spokane, WA

Friday, 18 November 2022, 7:30 pm

The Eugene Natural History Society invites you to their November Zoom meeting. The Zoom session will open at 7 pm Pacific Time (U.S. and Canada). This allows everyone time to get connected and join in friendly conversation. The meeting will begin at 7:30.

Zoom meeting link: <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09>

The 2022–2023 speaker season will consist of a mix of in-person, Zoom/in-person hybrid, and Zoom-only meetings because not all of our scheduled speakers are able to be present in person.



It is my great pleasure to introduce our November speaker, Dr. Nancy Staub, who is a professor of biology at Gonzaga University. Growing up in Minneapolis, MN, Nancy attended Earlham College in Richmond, IN, a private liberal arts college noted for its commitment to a collaborative approach in undergraduate education. Her mother was a homemaker, and her father was a pediatrician. She was always interested in animals, especially amphibians, and remembers rescuing tiger salamanders that had fallen into window wells during their breeding season. But she started on a different path at college, majoring in math. After a particularly challenging upper-division geometry class, she switched her major to biology, which she had always considered a back-up plan (but was actually her first love). She wasn't sure what she'd do after college but thought medicine might be a good fit with her interests.

One day when she was walking home after school she saw some geese flying and honking overhead, and she had second thoughts about medicine. She decided then that she really preferred being outdoors and that she would rather spend her life studying living organisms than spending time in hospitals. One of her most influential biology mentors at Earlham, who had gotten her degree at University of California at Berkeley, put her to work on an undergraduate research project.

During a postgraduation "gap year," Nancy applied to graduate schools in biology and was snapped up by UC Berkeley. Initially, Nancy

decided to study ecology, and she did a reading project with noted Museum of Vertebrate Zoology (MVZ) ornithologist Frank Pitelka, ironically on amphibians, and she began thinking about changing her focus. The real turning point came when she took an evolution course in the Department of Zoology taught by the Director of the MVZ (and world expert on the lungless salamander family Plethodontidae), David B. Wake (who was my PhD advisor at the time). Wake's evolution course was the rite de passage for all MVZ graduate students; not a trial by fire (as some unfortunate courses are) but an exposure to what could be called "informed independent thinking," of which Wake was an ardent advocate and practitioner.

Wake's approach to teaching and learning science was phenomenally exciting but also hugely challenging. (My own performance in the Wake evolution course left much to be desired.) Nancy decided to try to join the Wake team, but Dave first wanted to see how she did in the evolution course. She excelled. Dave then helped her pick the perfect doctoral research project: sexual dimorphism and monomorphism in the lungless salamander genus *Aneides*, a project that she would focus on for most of the rest of her professional career.

After 8 years at UC Berkeley, Nancy took a postdoctoral position at the Smithsonian Institution in Washington, DC, followed by an adjunct professorship at Gonzaga University that soon turned into a tenure-track position. Unlike most graduates from the MVZ who pursued positions at large research universities, Nancy knew early on that she wanted to be at a small liberal arts college where she could work with undergraduates, an experience that she treasured when she was an undergraduate at Earlham College. At Gonzaga, she has specialized in histological studies and has found that histology can be an exciting gateway to biological research for undergraduate students.

In addition to teaching classes in general biology, genetics, and evolution, she has individually mentored nearly 150 students (including a high school student and three high school teachers), getting them involved in

research, and has numerous publications with undergraduate coauthors.

Nancy has also served as Director of the Gonzaga Howard Hughes Medical Institute (HHMI) program, and she was recently elected to the Board of Governors of the American Society of Ichthyologists and Herpetologists (ASIH) and co-organized the Joint Conference of Ichthyologists and Herpetologists in Spokane last July.

Nancy describes herself as an organismal biologist interested in the evolutionary biology of salamanders. Specifically, she studies the evolution of sexual dimorphism and monomorphism in various salamander groups. She also has several projects focused on understanding how skin glands function in communication, especially which of the many

glands found in amphibian skin produce pheromones. Her passion is teaching and working with undergraduates, from freshman introductory biology classes to senior seminars. But she is also dedicated to using her own experience, paying it forward to motivate her students and getting them involved in the exciting realm of biological research. As she says on her website: “If you are interested in working in my lab, please schedule a time to chat. I’m always looking for bright and motivated students.”

Please join us at 7:30 p.m. on Friday, 18 November 2022, to hear Nancy’s talk “Body Types and Hormone Levels in Salamanders.”

—Stan Sessions

Invasion, Part II **by August Jackson** (See *Nature Trails* September 2022 for Part I)

Some bees are quiet, small, and inconspicuous. Although the colorful antics of the European wool carder bee are enough to capture the attention of any gardener, not every invasion is so dramatic. The punctate masked bee (*Hylaeus punctatus*) has crept across the North American continent with little fanfare. Diminutive, slender, jet black, and lightly accented with lemon yellow, the masked bees are deeply evocative of the hunting wasps from which they descended. They’re among the bees that elicit one of my favorite responses from an incredulous public: “You’re *sure* that’s a bee?”



Punctate masked bee. August Jackson

It’s a fair question. The masked bees are only sparsely equipped with hairs, the lack of which adds to their waspy appearance. Most bees are

coated liberally with feathery vestiture that facilitates the collection and transportation of pollen for larval feeding—a morphology and behavior separating them from nearly all other wasps. Instead, the masked bees carry pollen internally in a crop and have little need for external adornments. For this reason, they were long believed to be a primitive form and representative of a basal lineage of bees. Recent molecular phylogenies have upended this theory and established that these bees instead are among the most derived bee forms and have diversified rapidly in the relatively recent past.

Following a short backpacking trip in July 2015, a restful weekend at home afforded me a chance to better acquaint myself with some of the summer bees in our yard. Among these I found a little black bee on parsley that had gone to flower. I recognized it as a masked bee but slightly, almost intangibly, different from our native species (which are often only slightly, intangibly different from one another). By the end of the summer I had confirmed these little parsley bees as *Hylaeus punctatus*, and this observation appeared to represent the first record of the species in Oregon. Native to Europe, *H. punctatus* was originally detected on the North American continent in Los Angeles in 1981. Since then, the species has been sporadically discovered across the United States and into southern Canada. It has also been the beneficiary of an additional human-assisted introduction in

South America. Following a similar path of invasion as the European wool carder bee, *H. punctatus* too is at home in human-altered environments and appears to have a particular affinity for small-flowered members of the carrot family, many of which are garden favorites and/or common weeds.

Masked bees tend to nest in cavities in wood and other materials, which facilitates their long-distance travel by both anthropogenic and natural means. In a remarkable instance of transoceanic introduction, between 400,000 and 700,000 years ago a nest of *Hylaeus* masked bees in the subgenus *Nesoprosopis* dispersed from East Asia (likely Japan) across the Pacific Ocean, presumably floating on a log raft and eventually coming ashore on the Hawai'ian Archipelago. This would be the sole origin of nalo meli maoli—Hawai'i's native bees—and the only bees on the islands until subsequent human introductions.

The Hawai'ian Islands are the most isolated high island archipelago in the world, lying over 2,000 miles from any continent. Prior to human inhabitation, transoceanic species introductions were rare and largely facilitated by wind or water. That the masked bees made it to Hawai'i is a fantastical stroke of luck with historic consequences. The resulting story of natural selection is one to rival that of Darwin's finches. Without the evolutionary pressures of competition from other bees, these masked bees would be shaped entirely by the profligate opportunities of their new world. A single invading *Hylaeus* species spread across the islands and nearly all habitat types from the coast to the mountains, radiating rapidly into more than 60 species in likely less than 500,000 years (perhaps one of the fastest rates of speciation recorded).

There are more species of masked bees in Hawai'i than in North America north of Mexico, in spite of their much longer history on the continent. The 60+ species in Hawai'i make the subgenus *Nesoprosopis* the second most speciose; it comprises about 10% of all species in the genus. Through the lens of evolutionary time, it's an astonishing diversification in the blink of an eye. Most notable among these

Hawai'ian masked bees are four cleptoparasitic species. Cleptoparasitic bees, or “cuckoo” bees, are those that do not gather pollen to feed their young but instead lay their eggs in the nests of other bees. An estimated 13% of all bee species worldwide are cleptoparasitic, but these four *Hylaeus* cuckoo bees are not simply the only cleptoparasites in their genus but in their entire bee family Colletidae.

The Hawai'ian masked bees are uniquely diverse, but they also appear to have been extremely abundant. Robert Perkins, who spent 20 years as an entomologist in Hawai'i, wrote in 1912 that masked bees were “almost the most ubiquitous of any Hawaiian insects.” Although some species appear to be maintaining adequate populations, seven were added to the U.S. Endangered Species List in 2016—the first bees to be listed. Now, some of their greatest threats may come from other newly introduced bees.

There is no life on islands without periodic invasions. However, human-assisted invasions of flora and fauna have proceeded at startling rates on the Hawai'ian islands. Introduced mammals have contributed to deforestation and have had a particularly outsized impact on the native flora. Invasive ants and thrips have reduced native invertebrate populations and weakened flowering trees used by the masked bees. And the masked bees are no longer alone. More than 15 bee species have invaded the islands, including 2 other masked bee species. One of these, *Hylaeus strenuus*, hails from an obscure subgenus on the Indian subcontinent. Introduced in 2007, it is already better known from Hawai'i than from its native range.

Like the European wool carder bee and its relatives, the masked bees have a proven ability to move easily across long distances, both naturally and by anthropogenic means. In Oregon, our own introduced masked bee, *H. punctatus*, will likely remain a quiet introduction, better described as naturalized rather than invasive. But as organisms move and are moved to new regions at an increasingly rapid pace, bees will continue to be among these new arrivals with unpredictable consequences for the native flora and fauna.

Recent Insect Pests

by Dave Wagner

Perhaps the greatest pleasure of a nature loving writer is studying the natural world and telling stories or relating wonderful interactions with nature. These activities have been a joy for most of my adult life. I have been known to write that Nature has no conscience, because some natural phenomena cause great tragedy and cannot be ignored. This summer has been one of learning about things I wish I did not need to know.

On 30 June 2022, an unwanted immigrant was discovered in Oregon. The emerald ash borer (EAB; *Agrilus planipennis*), a beautiful but dreaded beetle native to eastern Asia, was found infesting Oregon ash trees (*Fraxinus latifolia*) in Forest Grove, OR. As its name implies, it attacks ash trees. The adults eat foliage, and its larvae eat the cambium just under the bark, killing a tree in the space of 10 years. Infestations spread rapidly and can kill up to 99% of affected trees.

The Invasive Species Centre in Ontario, Canada provides a succinct description of the EAB life cycle. Adult beetles actively feed on host plant foliage and lay eggs in host tree bark. The larvae chew out of the egg, bore into the wood or cambium, form pupal chambers, and overwinter. Large larval EAB populations can girdle the tree, eventually leading to tree death. When development is complete, the adult EAB chews out of the bark of the tree, leaving a distinctive D-shaped exit hole, and flies immediately.

The EAB has been killing ash trees in the eastern U.S. and Canada since 2002. It probably has been present since the 1990s, having arrived from Asia in shipping pallets made of hardwoods. Within the past 20 years, it has wrought billions of dollars in damage, causing five eastern U.S. ash species to be listed as critically endangered by the International Union for Conservation of Nature.

The appearance of this pest in Oregon did not catch us by surprise. Oregon has led the western states in preparations for the threat. An Emerald Ash Borer Readiness and Response Plan for Oregon was finalized in March 2021. The Oregon Department of Forestry has collected ash seeds from a wide area to capture genetic diversity, hoping that resistant strains may be

developed through breeding programs. *Forest Facts: Emerald Ash Borer* is an excellent document for understanding the issues (<https://www.oregon.gov/odf/Documents/forestsbenefits/fact-sheet-emerald-ash-borer.pdf>).

Conservation-minded individuals can help. First, we must learn to identify the beetles. They are in a family of beetles known for bright, shiny, metallic coloration. The EAB is small, only 0.5 × 0.125 inch. It is primarily green with a red upper abdomen when the wings are pulled back. [*Editor's note: Please don't confuse the EAB with the similar native, nondestructive golden buprestid beetle!*] We also need to learn to recognize an attack: yellowing foliage, crown die back, bark deformation, D-shaped exit holes, and woodpecker holes in the trunk. Report a possible infestation to the Oregon Invasive Species Council. Prevent spread by not transporting ash firewood; it should not be taken more than 30 miles from its source.

Other recent invasive species have not received the same attention. Two have been present in my yard for some time, but only this year did I identify them and attempt to deal with them. They are both leafhoppers (small sucking true bugs related to aphids and white flies) and have been the subject of intensive research this summer.

The Ligurian leafhopper (*Eupteryx decemnotata*) is one of several leafhoppers that are mint family specialists. It gets its name from the Ligurian region of northwestern Italy where it first became a serious agricultural economy issue. The Oregon State University Extension has issued a *Mint Pest Alert Newsletter* that mentions this species becoming a problem in mint fields in northeastern Oregon in 2020. There is one online record from western Oregon in 2019 and have been two more in 2022.

The Ligurian leafhopper attacks most of our popular kitchen herbs, such as sage, rosemary, basil, and thyme. Rosemary is the most susceptible to serious damage, followed by sage. Because I had not been able to maintain rosemary in my yard successfully, I contacted the OSU Extension office, and they suggested that the damage was being caused by this leafhopper and suggested buying a sticky yellow trap known to attract these pests. It worked as designed; a cloud of leafhoppers came flying out

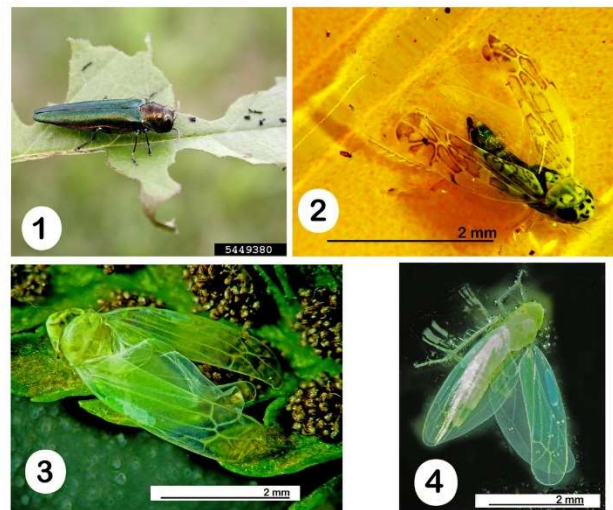
even as I drove the stake holding the trap next to our row of basil, rosemary, and sage. I was able to get a good image from a specimen stuck to the sticky trap. The spots on its head are the distinctive feature for confident identification.

Because herbs are used in cooking, application of toxic pesticides is not appropriate. An online search led me to an organic gardening site that recommended neem oil, an extract made from the Indian neem tree. It was very effective; after the first application, results from the sticky traps (used for monitoring and as a deterrent) indicated that the leafhoppers had practically disappeared. After 3 weeks both the rosemary and sage had produced healthy, vigorous shoots with no signs of leafhopper damage.

After dealing with my rosemary and sage leafhopper problem, I turned to the bleaching of ferns that has been getting more prominent in the past few years. A sticky yellow trap yielded the culprit: the green fern leafhopper (*Eupteryx filicum*). This species specializes in attacking ferns, mostly evergreen ferns. The amount of bleaching can be very prominent, but whether it affects the vigor of the ferns is not clear.

Control with neem oil did not seem practical because so many ferns in our yard were affected, everything from our favorite ornamental *Dryopteris* to native sword ferns. Another

organic option was pyrethrin, a natural extract of chrysanthemum. Because it is extra toxic to bees, this pesticide should be applied only to foliage, not on flowering branches. Ferns seem like a good candidate for pyrethrin application because all flowers can be avoided. I used a backpack sprayer at night when the bees were not flying. It did eliminate the leafhopper population (based on sticky trap monitoring), but we won't know whether it had a lasting effect until new fronds are produced next year.



1. EAB. Debbie Miller, USDA Forest Service
2. Ligurian leafhopper. Dave Wagner
3, 4. Green fern leafhopper. Dave Wagner

Events of Interest in the Community

- **McKenzie River Trust** <https://mckenzieriver.org/events/#event-listings> or 541-345-2799

Every Wednesday, 23 Nov. to June; 9–11:30 am. Watershed Wednesdays at Green Island. Join McKenzie River Trust every Wednesday morning at Green Island to help care for this special area where the McKenzie and Willamette Rivers meet! Projects differ based on the season but typically include invasive species removal, habitat care, planting, and tree establishment. Work is easy to moderately difficult. Projects are best for participants 13 years of age and older. Fall: invasive species removal, plant propagation. Winter: invasive species removal, planting. [Sign Up](#)

Second Saturday, 10 Dec., 8 am–4 pm. Living River Exploration Day at Green Island. Take a walk near the confluence of the Willamette and the McKenzie Rivers. Observe 15 years of tree-planting work on Green Island, a habitat for beaver, river otter, and over 150 species of birds.

- **Lane County Audubon Society** www.laneaudubon.org or 541-485-BIRD

Saturday, 19 Nov. Third Saturday Bird Walk with Donna Albino. The Third Saturday Bird Walk continues to be open to all participants. Reservations are no longer required. Destination and time to be announced; check the LCAS website and/or the Facebook page close to the walk date. Email for more information: audubon@laneaudubon.org.

Tuesday, 22 Nov., 7 pm. LCAS monthly meeting: Ram Papish Birding Adventure. This program will be available via Zoom and in person at the Campbell Senior Center, 155 High St., Eugene, near Skinner Butte. For more information, see the LCAS calendar on the website: <https://laneaudubon.org/events/>

Sunday, 1 Jan. 2023, 81st Eugene Christmas Bird Count. All previous ECBC participants are encouraged to participate this year, and new birders are always welcomed. We will find a team for anyone who wants to look for and count birds on 1 January. If you cannot be out with a field team, you can be a home counter, observing the birds in your yard and reporting your sightings to us at the end of the day. Social distancing on the 27 field teams will be determined by the team leaders, with input from the team members. Carpooling will be an individual choice. Complete details will be in the December *Quail* and on the LCAS website. If you have questions, contact count coordinator Dick Lamster, maeveanddick@q.com or 541.343.8664.

- **Nearby Nature** <https://www.nearbynature.org/> or 541-687-9699

Monday, Wednesday, Friday, 14 Nov.–16 Dec., 8:30 am–12:30 pm. Preschool Wonder Keepers, Fall Session 3. The Learnscape, Nearby Nature, Alton Baker Park, 622 Day Island Rd., Eugene. Rain or shine, kids 3–5. Children will enjoy sensory adventures, cooperative activities, nature storytelling, garden exploration, earth art, and free time in our outdoor play spaces. \$125 members, \$150 nonmembers for 1 day/week for the session (multiply for additional days per week). Online enrollment is ongoing.

Tuesday, Friday, 15 Nov.–16 Dec., 2:30–5:30 pm. Natural Neighbors After School, Fall Session 3. The Learnscape, Nearby Nature. Rain or shine, kids 5–11. Park exploration, natural science activities, earth art, and free time in our outdoor play spaces help students get to know their nearby animal and plant neighbors and deepen their personal connections to the amazing natural community. Online enrollment is ongoing.

Friday, 2 Dec., 8:30 am–4:30 pm. No School Day Adventure: Log Life. Hendricks Park, Eugene. Rain or shine, kids 5–11 in groups of 12. Investigate the woods-wide-web of life in Hendricks Park! Discover how trees “talk” and how forests get ready for winter. Find funky fungi, build tiny forest forts, and create cool cone craft. Tell tall tree tales and celebrate trees that stay evergreen year-round. \$60 members, \$70 nonmembers. Preregister online.

Tuesday, 13 Dec., 10–11:30 am. Green Start Play Day: Furry Friends. The Learnscape, Nearby Nature. Rain or shine, kids 5 and under with an adult. Enjoy outdoor nature play plus toddler and preschool activities and stories all about furry animals. Members free, \$7/family nonmembers. Preregister online.

- **Cascade Mycological Society** <https://cascademyco.org/>

Sunday, 11 Dec., 1–3 pm. Mountain Rose Sunday Series: Mushroom Dye Talk and Demo. Mountain Rose Herbs Annex, next to the Mountain Rose Herbs Mercantile, Eugene. Free, but registration required, class limit of 24.

- **Friends of Buford Park and Mt. Pisgah** <https://www.bufordpark.org/> or 541-344-8450

Because people and nature need each other, the Park is OPEN during the COVID-19 pandemic. Please go to the [Lane County](#) website for instructions about the park and updates.

- **Museum of Natural and Cultural History, University of Oregon** <https://mnch.uoregon.edu/museum-home>

Thursday, 1 Dec., 5:30–7:30 pm. Maps and Trails. Featuring posters and artwork celebrating Oregon’s outdoors.

Thursday, 8 Dec., 5:30–7:30 pm. Oregon Authors. Featuring local writers, including Marli Miller and Bill Sullivan.

Thursday, 15 Dec., 5:30–7:30 pm. Art of Science. Featuring displays from Erika Beyer, Ian Peterson, and Malie Urbanic.

Holiday Nights at the Museum. Visit the Museum this holiday season and enjoy hot cider, refreshments, and discounts.

Admission to the store is always free, and admission to the museum is free with a donation of canned food. Go to <https://mnch.uoregon.edu/programs> or call 541-346-3024 to learn about the Museum’s many exhibits and programs.

- **Native Plant Society of Oregon, Emerald Chapter** <https://emerald.npsoregon.org/>

See their website for programs and information.

- **WREN (Willamette Resources and Educational Network)** <https://wewetlands.org>

See their website for programs and information.

ENHS welcomes new members! To join, fill out the form below. Membership payments allow us to give modest honoraria to our speakers and pay for the publication and mailing of *Nature Trails*. Find us at:

<http://eugenenaturalhistorysociety.org/> https://www.youtube.com/channel/UCERYzVh9lw9y-nLS_t94BVw

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Memberships run from September to September. Annual dues for renewing members are payable in September. Generosity is encouraged and appreciated.

ENHS
P.O. Box 5494
Eugene, OR 97405

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2022–2023 Speakers and Topics

18 Nov.	Nancy Staub	Body Types and Hormone Levels in Salamanders
9 Dec.	Jeff Fleischer	Winter Raptor Surveys in the Pacific Northwest (cosponsored with the Lane County Audubon Society)
20 Jan.	Lisa Ballance	Marine Mammals
17 Feb.	Taylor Chapple	Sharks of the Pacific Northwest
17 Mar.	Pat O’Grady	Archaeology of Oregon
21 Apr.	David G. Haskell	Sounds Wild and Broken (cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)
19 May	Jamie Bowles	Sierra Nevada Red Foxes