

# Nature Trails

Published by the Eugene Natural History Society

Volume 58, Number 9, December 2024

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.



Portland park locations for Spotted Towhee study. ArcGIS image  
*Jemy McKay*

## The Modern Bird World ... Living for the City

**Michael Murphy**

**Professor Emeritus  
Department of Biology  
Portland State University**

**Friday, 13 December 2024, 7:00 pm**

**(Co-sponsored with the Lane County Audubon Society)**

**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: Michael Murphy



It is a pleasure for me to introduce our speaker for this month, Dr. Michael Murphy of Portland State University. This is his second talk to the ENHS, and this time he will be talking about his recent research on bird diversity in urban environments. I first met Mike over 30 years ago when I interviewed for a job at Hartwick College in Oneonta, NY. Mike, whom I had never met before, picked me up at the Binghamton airport, and we spent the rest of the evening drinking Sam Adams beer and talking biology in the Autumn Café in downtown Oneonta. We found much in common; we had earned our PhD degrees at sister zoology museums, his at the University of Kansas and mine at the University of California, Berkeley (more about this later). My job interview the next morning went surprisingly well, hangover notwithstanding!

Mike grew up in Eden, NY and, like many budding biologists, spent much of his childhood wandering through forests looking under rocks for interesting critters; an inveterate “rock flipper” as he puts it. He was mostly self-motivated, but his older brother was a professional biologist and his earliest mentor, employing Mike in the summers to help on crayfish research projects. Even though Mike grew up in a Catholic family and attended a Catholic grade school, he felt encouraged by both his parents and his teachers to pursue his interests in biology, and he credits his parent’s gift of a Time-Life book (*The World We Live In*) for fueling his passion for biology (he still has the book, of course).

After high school, Mike enrolled at the State University of New York, Albany but soon transferred to Canisius College and then Fredonia State University. At FSU, Mike had the opportunity to conduct research on plant communities as part of a National Science Foundation Research Experiences for Undergraduates (REU) program and found his first real academic mentor, ornithologist James W. Parker, who convinced him to switch his interests from plant ecology to birds. Parker included him in a summer research trip to Kansas to study Mississippi Kites, where Mike got hooked on kingbirds! And that was it; he has conducted research on kingbirds since 1979. It also helped that Mike’s wife, Karmel (his high school sweetheart), also was interested in bird diversity.

After getting his BA degree at FSU, Mike was accepted into the graduate program at the University of Kansas in 1978, where he earned his PhD degree in 1985 working with Richard Johnston. This is the point where our paths crossed. Johnston’s mentor was Alden Miller, whose mentor was Joseph Grinnell, the first director of the Museum of Vertebrate Zoology at UC Berkeley. Thus, Mike was an academic descendent of Grinnell from Berkeley, where I had received my PhD degree.

Mike and Karmel always wanted to return to New York, and in 1988, after spending 4 years at Indiana State University on a 2-year postdoc and then a 2-year teaching appointment, Mike was hired to fill a 3-year, non-tenure-track assistant professor position at Hartwick College. Five years later he was able to apply for the same job as a tenured position, and he stood for tenure the year after I did. While at Hartwick, Mike and I became good friends and colleagues, reinforcing each other’s determination to break the mold of what it means to be a professor at a small, private liberal arts college. Mike led the way in rejecting the idea that we should focus all of our attention on teaching and leave the serious research to our colleagues at the big research universities. Hartwick did not have a graduate program, but Mike found that undergraduates could, with appropriate guidance and TLC, be trained to do graduate-level research, and he regularly involved his students as co-authors on research papers. As a result, he was able to produce on

average about two papers per year. I tried to follow his lead, and Mike and I found ourselves outliers in a small-college academic community that paid little attention to published research. But Mike also strove to be a good teacher and managed to be a success in both areas.

After 12 years at Hartwick, Mike was snapped up by Portland State University to fill a vacancy left by the legendary Dick Forbes, an opportunity he could not resist. Mike was an inspiration to me, and I felt a sense of personal and professional loss when he left Hartwick. But Mike thrived at PSU, developing a long-term research program on kingbirds at Malheur Wildlife Refuge, which complemented his research on kingbirds in the bucolic forested-farm landscapes of the eastern United States. He also served as chair of the biology department at PSU and editor-in-chief of *The Auk* and won several teaching awards. Mike is now retired and lives with his wife and family in Portland. Here's what Mike says about his upcoming ENHS talk:

We live in a time of rapid change driven by environmental modifications by humans, especially expansion of urban areas. Is it possible for wildlife and birds specifically to maintain healthy populations in urban environments? I am addressing this question by studying avian populations and communities in parks and greenspaces (P&GS) in the metropolitan region of Portland. Our analyses indicate that P&GS, especially those that maintain native habitat features, enhance abundance of both residents and long-distance migrants but that the specific needs of permanent resident and migrant birds differ. Resident species can thrive in either small or large P&GS, but long-distance migrants require larger P&GS; most of these migrants are not found in areas of less than 25 acres.

Among resident species, woodpeckers are an exception. They all require larger P&GS because of their dependence on forests; thus, management for species such as Hairy and Pileated Woodpeckers would likely serve to support all forest-dependent species. Ultimately, however, urban species will persist over the long term only when local production of young exceeds mortality rates. Studies of Spotted Towhees in Portland have confirmed that local populations can replace themselves but only when the added mortality from unique urban sources (e.g., outdoor cats) is eliminated.

Join us in person on Friday, 13 December, in 221 Allen Hall on the UO campus to hear about Dr. Michael Murphy's work with urban birds. There will be cookies. If you can't make the trip, you won't get the cookies, but you can Zoom in at

<https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09> or find the Zoom link on the ENHS website at <https://eugenenaturalhistorysociety.org/>

—Stanley K. Sessions

A note about Zoom. The ENHS presentations have been livestreamed via Zoom since the pandemic, and this approach has been mostly successful, with occasional glitches. We continue to work at improving the digital feed for our online audience.

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## Preserving an Ancient Feast: A Delicate Balance in Modern Times

by Reida Kimmel

Growing up in Stonington, CT whose only public beach was rocky and polluted, I adored my all too infrequent trips to Rhode Island's beautiful sandy Misquamicut Beach, just a few miles but a whole world away. On hot summer days, my friends and I waded along the beach

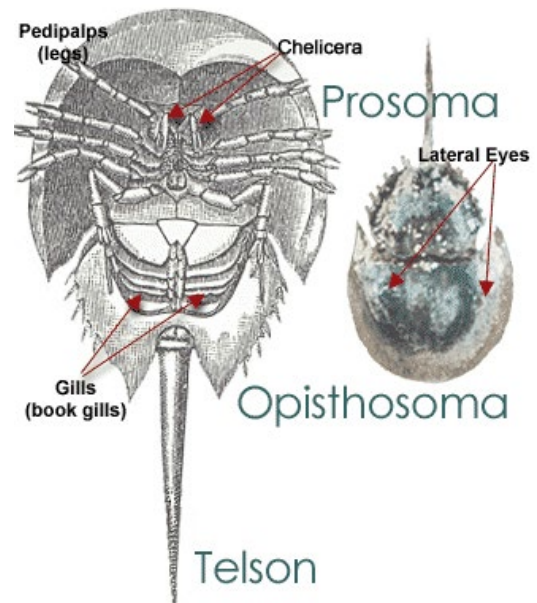
collecting interesting objects and creatures, the weirdest of all being the horseshoe crabs (*Limulus*). We knew they had come ashore to lay eggs, but so many had washed in upside down and were waving their legs helplessly in the hot sunshine. We feared they would die, so we picked them up, turned them over, and carried them to the water's edge, where we believed they would be cool and safe.

Horseshoe crabs are not crabs at all. The four extant species, one in North America and three in Southeast Asia, resemble the ancient trilobites that inhabited the seas from the Cambrian until the Permian extinction. *Limulus* larvae are called “trilobite larvae,” but horseshoe crabs are not trilobites. They have been around for over 300 million years, and their closest relatives are arachnids, including harvestmen and sea spiders. This ancient creature is an evolutionary marvel, unchanged since the genus first appeared, and now all four species are faced with extinction within this century! The three Southeast Asian species are already close to extinction from overfishing for food and bait and from pollution and development.

The North American *Limulus polyphemus* (also called *Limulus ameboycte*) ranges from Mexico to Maine. A weird and wonderful animal, its eyes are astonishingly complex. The two lateral compound eyes have rods and cones and are adapted for sight in both light and dark. Five more eyes sit on top of its main body part, the prosoma. Very oddly, from a human perspective, the telson or “tail,” which is used for steering and to help an upended *Limulus* turn over, has 10 photoreceptors that aid in perception of light and dark.

Horseshoe crabs are ocean dwellers that come ashore on the spring high tides to spawn. The slightly smaller male uses his ambulatory pedipalps (think legs) to cling to the female’s back. She may have other males following as well. Fertilization by the clinging male is external and most efficient. Each female digs a nest near the high water mark and lays up to several thousand eggs, which the attached male will fertilize. She may then move on and lay even more clusters of eggs before returning to the sea. The eggs take a few weeks to hatch. Some will even overwinter before hatching. What a resilient evolutionary strategy!

Before hatching, the larvae molt four times. When they do hatch, the tiny larvae do not head out to sea. Instead, they find their way to marshes, brackish or salt, near the shore and grow slowly, shedding their exoskeleton periodically. As free swimming trilobite larvae, they go through about 18 more molts before they mature. Females go through one or two more molts than males, ensuring that they will be



*Limulus* anatomy. Maryland Department of Natural Resources

larger. Juveniles eat whatever is available and in turn are prey for blue crabs, spider crabs, and hermit crabs. As adults, horseshoe crabs devour worms and bivalves such as soft shell clams, mussels, and razor clams. People making their living from the sea loathe horseshoe crabs because they eat shellfish. Some Cape Cod towns offered a bounty on horseshoe crabs and had laws requiring that all horseshoe crabs be gathered from the beach and thrown up on dry land. Life for *Limulus* is not easy. Gulls eat them, especially the flipped and stranded spawning females. They are an important food source for loggerhead turtles in Chesapeake Bay. Florida’s alligators find them tasty, and sharks are known to feed on them at sea.

In recent decades as the population of *L. polyphemus* plummeted, especially in Delaware Bay, which has always been the largest spawning site in North America, suspicions focused on the harvesting of horseshoe crabs for medical use. Horseshoe crabs have evolved a unique ability to ward off infection and heal wounds. Seawater contains gram-negative bacteria that produce an endotoxin. When a wounded *Limulus* encounters the bacteria with the endotoxin, the *Limulus* blood clots. The clotted blood then kills the bacteria and neutralizes the endotoxin, allowing the wound to heal. The factor that causes this clotting is *Limulus ameboycte* lysate (LAL). *Limulus* blood is collected commercially, and the extracted LAL is used to test for bacterial endotoxins in people. Many thousands of human

lives have been saved by using LAL to detect bacterial infections. However, of the *Limulus* collected for LAL extraction, an estimated 30% die. An uncounted number of others are left in poor condition and cannot spawn. A synthetic LAL has been available for over 20 years but has not gained federal approval. In 2021, medical researchers produced a new version of synthetic LAL that includes the full cascade of enzymes needed for the detection of endotoxins, making this new synthetic LAL much more effective and more likely to be fast-tracked for approval.

However, other serious problems continue to affect the *Limulus* population. Annual stock assessments indicate a decline from over 2 million individuals breeding on beaches in the 1990s to less than 1 million breeding individuals in the years since 2004. The biomedical harvest accounts for a small proportion of deaths even when biomedical mortality is factored in with “dead discards.” The overwhelming number of horseshoe crab deaths are caused by bait fisherman who collect thousands of these animals on the beaches and by ocean trawling.

It is imperative that every effort be made to halt the cascading downslide of North America’s *Limulus* population. Horseshoe crab eggs are the primary source of essential calorie-rich food for migrating shorebirds as they journey hundreds or thousands of miles north from their wintering grounds. These fatty eggs help many shorebird species get into prime condition for successful nesting. For the nearly threatened Red Knots, which migrate 9,000 miles from southern Australia and South Africa to breed in the Arctic, the thousands of eggs that only a large and

vigorous horseshoe crab population can provide are essential to their lives and to the future generations of nestlings. The Center for Biological Diversity and other groups are calling for federal listing of *Limulus* and for protecting its habitat. Although these protections currently seem like a dream, individual states are taking action, with Connecticut, Massachusetts, New York, and South Carolina imposing partial bans on *Limulus* harvesting. Now let’s hear from Delaware and New Jersey! Advocate!

I thank the following for inspiration for this article:

Michael Dawson, Falmouth Forum, 22 November 2024

Maryland Department of Natural Resources, Horseshoe Crab Anatomy

Carrie Klein, “Turning the Tide,” *Audubon*, fall 2024



Red Knot. John James Audubon

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## Truffle Field Trip

by Tom Titus



Mari Baldwin

On a rare rainless Saturday morning in November, nine natural history enthusiasts joined truffle expert Dr. Charles Lefevre at the Eagles Rest Trailhead. Our goal? To encounter as many species of native truffles as possible and learn about truffle diversity and biology from one of the preeminent truffle mycologists in North America. To be clear, our group was actually accompanying Charles’s two energetic Italian truffle-sniffing dogs (Lagotto Romagnolos), Dante and Luca.

Charles provided a quick introduction to the biology of native truffles. The biomass of truffles is as high below ground as that of the mushrooms that fruit above ground. Truffles are mushrooms that have evolutionarily divested from the above-ground fruiting body and the ability to disperse their own spores, which are completely encased inside that aromatic morsel. Thus, truffles have opted for a lifestyle that requires them to be broken open to propagate. They attract other beings as spore dispersers by exuding aromatic compounds attractive to hungry animals. Eaters of truffles include deer, elk, bears, squirrels, and flying squirrels. The list includes humans, even though we take their spores back to town where they are of no use to the ongoing regeneration of truffles.

After our introduction, we followed a trail into an old forest of Douglas-fir, western hemlock, western redcedar, and vine maple. Dante and Luca were excited to be off; they have been trained to seek out the smells exuded by truffles. In the world of truffle dogs, they are unique because Charles has trained them to have indiscriminate noses, thus to search for truffles of any species. This makes them useful for surveys of native truffle diversity in addition to their work harvesting commercially important truffles. But don't romanticize their attraction to truffles. When one of the dogs is onto one, Charles is quick to the spot, sometimes ducking and weaving through dense vine maple to recover the fungus. On several occasions, he was too late. The dogs had already eaten the truffle. Never mind. Raucous celebration and dog treats all around. For Dante and Luca, finding a truffle is the best thing ever.

As much fun as Charles was having taking us out, he was fundamentally all business. After each truffle was cut in half with a utility knife, it

was passed around for us to experience their unique interior morphology and aroma. The specimen was then placed in a ziplock bag with a data card to be returned to his lab where it would be more carefully identified and eventually logged into an herbarium.

We were, literally and figuratively, on the cutting edge of truffle research. Charles summarized this field trip in an email to the group:

The experience you had on Saturday was unique. To my knowledge, there are only two of us in North America who are using dogs to systematically survey truffle diversity in natural forests. We found 13 separate collections on our outing, only 2 of which were duplicates, so we collected 11 truffle species over a span of a few hundred yards and about 90 minutes. To put this in context, truffles are so hard to find that there are probably only two or three fungal herbaria that have more than a few hundred specimens in their collections. At the rate we were finding them on Saturday, it wouldn't take long to have one of the largest collections on the planet.

We were 1 hour from Eugene; not in an unexplored tropical rainforest, not in a secluded corner. In this remnant patch of temperate old forest, our easy stroll was actually cutting edge field work, and new species are waiting to be discovered.

Want to learn more about these fascinating fungi? Charles Lefevre will be our 17 January 2025 speaker. And stay tuned to *Nature Trails* and our website for announcements of other Eugene Natural History Society field trips in 2025, including a salamander excursion into the Coast Range.

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**Keep your copies of *Nature Trails* coming and support our efforts to provide fascinating natural history presentations every month and occasional field trips!**

**Annual ENHS dues are payable in September. If you haven't renewed by December, you will no longer receive *NT*. (Check your mailing label for a red circle around your expiration date.) Please renew by mail soon at the address on the back of this issue. You can also renew and pay electronically at**

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## 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.** Every Wednesday through 18 Dec.  
Projects include invasive species removal, habitat care, planting, and tree establishment. [Sign up](#)  
**Saturday, 14 Dec., 8am–4pm. Living River Exploration Day at Green Island.** Free, no preregistration.
- **Native Plant Society of Oregon, Emerald Chapter** <https://emerald.npsoregon.org/>  
**Monday, 16 Dec., 7–9pm. Holiday Social.** Bring photos and snacks and share tales of your botanizing adventures this year. Amazon Community Center, 2700 Hilyard, Eugene.  
**Anytime. Self-guided Tour of Laurelwood Bog.** Go south on Agate St. in Eugene to the dead end at 29th. The entrance to the Bog is clearly signed, and the trails are covered with bark.
- **Mt. Pisgah Arboretum** <https://mountpisgaharboretum.com> or 541-747-3817.  
This 209-acre nature education facility is open daily until 3 pm. Visitors can explore the ecology of the southern Willamette Valley by wandering the many trails along the river and up the mountain.
- **Lane County Audubon Society** [www.laneaudubon.org](http://www.laneaudubon.org) or 541-485-BIRD; maeveanddick@q.com or 541-343-8664  
**Friday, 13 Dec., 7–9pm. The Modern Bird World ... Living for the City** (co-sponsored with ENHS, see this issue of *Nature Trails*).  
**Saturday, 28 Dec., all day. Cottage Grove Christmas Bird Count.**  
**Sunday, 29 Dec., all day. Eugene Christmas Bird Count.**  
**Tuesday, 31 Dec., all day. Oakridge Christmas Bird Count.**
- **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; Capturing the Cosmos: Images from the James Webb Telescope.
- **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.

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<http://eugenenaturalhistorysociety.org/>

and

[https://www.youtube.com/channel/UCEr\\_yzVh9lw9y-nLS\\_t94BVw](https://www.youtube.com/channel/UCEr_yzVh9lw9y-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=eE9sdG9hSHMvOHhIUeJuU21wT20rdz09>

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)

**2024–2025 Speakers and Topics**

20 Sept.	Patty Garvey-Darda	<b>Why Did the Ecosystem Cross the Road?</b>
18 Oct.	David Mildrexler	<b>An Enduring Conservation Vision for the Blue Mountains Ecoregion</b>
15 Nov.	David G. Lewis	<b>Tribal Histories of the Willamette Valley: Reconstructing Traditional Environments</b>
13 Dec.	Michael Murphy	<b>The Modern Bird World ... Living for the City</b> (co-sponsored with the Lane County Audubon Society)
17 Jan.	Charles Lefevre	<b>Northwest Truffle Diversity</b>
21 Feb.	David Paul Bayles	<b>In Trees I Trust</b>
21 Mar.	Nina Ferrari	<b>Into the Third Dimension: Understanding Vertical Distributions of Birds in Old-Growth Forests</b>
18 Apr.	Sara Hamilton	<b>Taking Care of Oregon's Kelp Forests</b> (cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)
16 May	Clara Bird	<b>Gray Whale Foraging Behavior</b>