

# 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.



Jamie Cornelius in Grand Tetons National Park. *Taylor Chapple*

## Amazing Adaptations: How Birds Survive Stormy Weather

**Jamie Cornelius**

Department of Integrative Biology,  
Oregon State University, Corvallis

**Friday, 17 October 2025, 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. **Snacks provided!** The Zoom lecture link is <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUeJuU21wT20rdz09> or see our website at <https://eugenenaturalhistorysociety.org/>

## This Month's Speaker: Jamie Cornelius



Dr. Jamie Cornelius can be difficult to catch up with. We finally connected by phone when she was fresh home from working in a remote region at 11,000 feet in the Sierra Nevada in California. She and a student were studying a population of White-crowned Sparrows who winter in Baja California then make the high-elevation trek to breed in the Sierra. The birds arrive there in May and then must contend with dual energetic demands of staying warm during late spring snowstorms and beginning to breed. The storms can return in early fall before the birds leave, a time when they are then dealing with the added energy costs of molting and new feather growth. It may not be an accident that the White-crowned Sparrows of the Sierra Nevada are a lot like Jamie herself, traveling to demanding places with seemingly boundless energy to meet various challenges, including research, teaching, singing, songwriting, and raising a family.

Born in Vancouver, WA, Jamie's path to a career in field biology began early. Her parents were outdoor people who took her, her identical twin sister, and their older brother on many family excursions. A high school biology teacher in Jamie's International Baccalaureate program was particularly interested in physiology, and because of her Jamie became fascinated with kidneys. That's right. She can speak poetically about kidneys. The elegant simplicity of their

design. Their critical and complex functionality in maintaining homeostasis. Kidneys were formative in her early career as a physiologist.

Following high school Jamie stayed close to home and attended the University of Washington. Because of her fascination with physiology and her love for animals, she thought herself destined for a career in veterinary medicine. In fact, by her senior year she was either being interviewed or had been admitted to several veterinary schools, a major accomplishment. Nevertheless, she determined that a life in veterinary medicine wouldn't work for her. Despite the reputation of UW as a research institution, Jamie had no clue that she might become a career researcher. Enter research professor and environmental physiologist Marilyn Ramenofsky, who took Jamie under her wing and steered her onto career possibilities in research. Jamie soon found an elegant intersection of physiology, wild animals, and field work in studying the response of birds to stress.

After completing her B.S. degree in zoology at UW, Jamie never looked back. She entered the Ph.D. program in animal behavior at the University of California, Davis, where she studied the physiology and migratory response of birds to extreme fluctuations in their environment. Red Crossbills fit the bill, so to speak. They became the primary focus of her work because they use their crossed bills to feed on conifer seeds that are unpredictable in time and space. This theme of unpredictability figures prominently in Jamie's research today.

Following her Ph.D. degree, Jamie migrated. She accepted a position as a postdoctoral scholar at the Max Planck Institute of Ornithology in Germany. There she continued her work with Red Crossbills, this time evaluating the energy costs of their unique ability to breed in both summer and winter in cold climates. This project has become a long-term interest and is now the focus of her National Science Foundation career award. She flew further and became a Fulbright fellow at St. Petersburg State University in Russia. There she studied molt in a family of finches with variable migratory strategies.

Jamie returned to the United States as an instructor at California State University, Monterey Bay then moved on to her first

assistant professor position at Eastern Michigan University. Five years later she became a Beaver, joining the Integrative Biology Department at Oregon State University and starting the Little Bird Lab. Her website outlines research programs that seem to have spiraled upward and outward. In addition to her work on migration as a response to unpredictable resources, her lab members now study communication among birds in response to food scarcity. They also investigate the impact of urban toxicants on birds. Other research is focused on the role of fear for birds who nest in urban versus rural settings. Her group also has been delving into the increasingly important issue of how birds respond to wildfire smoke. To top it off, she has a project going in Argentina studying pink flamingo ecology and conservation, including their response to stress, exposure to toxicants, and seasonal patterns of movement. Despite this diversity in research topics, the common thread is easily discerned. Jamie is fundamentally interested in how birds respond to uncertainty in their environment. And all of her topics could easily apply to humans.

As if all of this weren't enough, Jamie also maintains a deep-seated devotion to creativity and its role in both science and art. She is a singer-songwriter and has recently released an album with the very biological title "A Study of Life," featuring harmonies with her twin sister Lindsay. Jamie's childhood friend, Michelle Swinehart, is an artist on faculty at Portland State University. After talks about the commonalities and differences in their respective fields, Jamie's lab now collaborates with Swinehart and Michelle Illuminato, also at PSU, to explore how creativity can inform both fields. Jamie's students have followed suit, merging

science with art and songwriting in fellowships through the Patricia Valian Reserch Center for the Creative Arts (PRAx) in Corvallis.

I could continue on about Jamie's awards for teaching engagement and expertise. Needless to say, they are prodigious. She is the full package: a field ornithologist who uses cutting edge research techniques in physiology and behavior to study the responses of real organisms in the real world, one fraught with change on global and local scales. As a scientist, she is committed to communicating her message to a planet increasingly in need. Join us in 221 Allen Hall on the UO campus to hear Dr. Jamie Cornelius speak on the topic "Amazing Adaptations: How Birds Survive Stormy Weather." She encapsulated her talk in these words:

Songbirds are tiny endotherms—and those that remain in cold places face the gargantuan task of maintaining a warm body despite short winter days that can be quite stormy and devoid of food. It's a challenge that many fail to meet, but we are interested in the survivors. What helps them to cope when food becomes scarce or when a big storm hits? Do all birds share the same capacity or are some more highly specialized than others? I will share some amazing adaptations that we have discovered over the past decade, including how social information might help birds survive when the going gets tough.

If you can't join us in person, by all means connect on Zoom:

<https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09> or join from

our website at

<https://eugenenaturalhistorysociety.org/>.

Did I say there will be cookies? Yes, there will be cookies! —Tom Titus

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## **Mimicry** by August Jackson

Mimetic forms in nature have captivated evolutionary biologists since the middle of the 19th century. Pioneering work investigating mimicry focused on convergent forms in butterflies, with Henry Walter Bates and Fritz Müller describing the selective forces driving the two dominant expressions of mimicry, each named after its author. Batesian mimicry is better known, describing instances in which a harmless

organism develops a resemblance to a model organism with which it co-occurs and that is toxic, venomous, or otherwise threatening. This mimicry frequently involves the deployment of aposematic (warning) coloration (think the vibrant, contrasting colors of coral snakes, monarchs, and yellowjackets), and it is easy to imagine how this similarity in appearance might deter would-be predators.

Both Bates and Müller spent a significant portion of their lives studying butterflies in the Brazilian Amazon and were confounded by strongly convergent forms in butterfly species that bore no close relation—and were both toxic. After working through several hypotheses, Müller eventually proposed a distinct form of mimicry in which one or more protected (toxic or venomous) species may imitate another, explaining the benefit as follows:

If each single bird has to learn this distinction [between tasteful and distasteful prey] by experience, a certain number of distasteful butterflies must also fall victim to the inexperience of the young enemies. Now if two distasteful species are sufficiently alike to be mistaken for one another, the experience acquired at the expense of one of them will likewise benefit the other; both species together will only have to contribute the same number of victims which each of them would have to furnish if they were different.

Originally published in the German journal *Kosmos*, Müller's article was brought to the attention of the Entomological Society of London by Charles Darwin and translated into English for publication in the *Transactions of the Royal Entomological Society of London*. This article was a profound contribution to work on natural selection, and Müllerian mimicry continues to cause problems for scientists. Mimicry in some species is so complete as to confound identification or raise questions about whether a species exists at all.

In North America, the social Hymenoptera (most notably bumble bees and yellowjackets) are prime models for both forms of mimicry. Although there are solitary wasps that possess more potent stings, those stings are meant for the immobilization of arthropod prey. The stings of bumble bees and yellowjackets have evolved specifically to provide colony defense. They pack an initial punch but also activate a long-lasting histamine response, making the sting more memorable for the recipient. These colonial insects are also ubiquitous in the environment, providing for effective predator education. Bumble bees have inspired a number of Batesian mimics, from clear wing moths in the genus *Hemaris* to robber flies (predators themselves) in the genus *Laphria*. Perhaps the most interesting

mimic is *Anthophora bomboides*, a digger bee widespread across North America that is known to nest in dense aggregations. The specific epithet literally means “like a bumble bee.” To conform, *A. bomboides* is, in fact, like many different bumble bees.



*Bombus centralis*, bumble bee. August Jackson



*Laphria fernaldi*, robber fly. August Jackson



*Anthophora bomboides*, digger bee. August Jackson

Approximately two dozen bumble bee species can be found in the Pacific Northwest. It is a manageable number of species to learn, but about half of the species exhibit multiple color forms, adapting regionally to Müllerian mimicry rings. West of the Cascade Range in the Pacific Northwest, the aposematism presents as a recognizable pattern of black hair with accenting bands of yellow. About a dozen species fall into this mimicry ring, which is one of the most notable in North America. Within this mimicry

ring, two species that are common in the Willamette Valley (*Bombus vosnesenskii* and *Bombus caliginosus*) can reliably be told apart in the female sex by only a submillimeter difference in “cheek” length and the presence or absence of several scattered yellow hairs on the underside of the abdomen. They can be told apart in the male sex by only a subtle but distinct difference in the shape of the penis valves. So it goes.

East of the Cascades, solid yellows or contrasting yellows and oranges are in vogue, and species that look much different in the maritime portions of their range converge on this dominant color form. This shift is profound, and the Batesian mimics follow suit. The *Laphria* robber flies trade in black bands for oranges, and the bumble bee mimic digger bee does likewise but puts black back on in the mid-Atlantic states.

Although empirical evidence is slim, given the strong selection on mimetic forms we can presume that predator education—and confusion—is efficacious. Certainly it has been a source of confusion for scientists. Bumble bee species are shouldered with sometimes dozens of synonyms, which in each case provide a historical accounting of the attempts of taxonomists to wrestle with the wide variation in color forms. At various times species have been split into two or three taxa or merged into a single species based on analysis of morphology and biogeography. For example, the closely related *Bombus flavifrons* and *Bombus centralis* were sometimes considered conspecific but can be reliably separated in both sexes even where their color forms are convergent.

The work continues, and recent advancements in molecular methods are challenging some morphological species concepts. The distinction between *B. flavifrons* and *B. centralis* is supported by morphology and by DNA, but in some instances the results are not so clear cut. Lines of evidence from DNA barcoding are suggestive of cryptic species complexes (hidden species as a subset of recognized species) when individuals cannot always be separated morphologically. How we develop consistent species concepts is an enduring question, and the tendency among bumble bees to form Müllerian mimicry rings

continues to aggravate our attempts to neatly and concretely define species.

The golden northern bumble bee (*Bombus fervidus*) is widespread across North America and can be found in a wide range of habitats in Oregon. Depending on how the species is defined, it is one of the most common in the state. The California bumble bee (*Bombus californicus*) has variably been considered a distinct species or simply a regional color form of *B. fervidus*. *B. californicus* fits solidly into the Pacific maritime mimicry ring, being largely black with a yellow band at the front of the thorax and another near the rear of the abdomen. This form is found predominantly west of the Cascades, with individuals becoming somewhat more yellow and more like the typical *B. fervidus* form as one moves east.

In our job of cataloging bees statewide, the Oregon Bee Atlas considers *B. californicus* and *B. fervidus* to be conspecific, representing a change in color forms as the species adapts to the dominant mimicry ring over its geographic range. This hypothesis is additionally supported by the appearance of the males of the species, which more readily express the breadth of color forms. In the haplodiploid mating system of bees, males are hatched from unfertilized eggs and thus express more recessive traits. If speciation has occurred, it has been recent enough that males are particularly indistinguishable.

Molecular evidence does suggest that the process of speciation may have begun during periods of glacial maxima when populations were separated, although the speciation may not be complete. Despite a small sample size, it is compelling that no reproductive crossover has been observed in populations in which the two color forms are found together. However, intergradation in the color forms and a lack of divergence in the male genitalia means that these potential species cannot reliably be distinguished morphologically, at least without further investigation.

Species concepts represent our best attempts to categorize natural selection in motion. Species are not static, and wrestling with the blurred lines is a puzzle that can feel as philosophical as scientific. In the case of bumble bees, they may adverage on mimicry rings, diverge, and rejoin.

At best our attempt to define nature is an academic pursuit, but at a time when natural areas are shrinking worldwide how we delimit species can produce real-world consequences. *B. fervidus* appears to be declining in portions of its range, particularly in the eastern United States. If *B. californicus* is conspecific and simply a

mimetic color form, then declines in the western states are essentially nonexistent— *B. californicus* is one of our most common bumble bees, and a very limited pool of conservation dollars could be better spent elsewhere.

### **A Note to Our Members Regarding Dues**

The ENHS Board has reluctantly decided to raise membership dues. We realize that for some members, these are tough times and many prices are increasing. Unfortunately our costs also are increasing, and we can no longer meet our financial obligations with our previous dues structure (we have not raised dues since 2011). Our greatest expense after speaker honoraria is printing and mailing of *Nature Trails*, so please consider going paperless. Electronic *NT* documents are sent via email and include color photos and live links and can be printed at home. We thank you for your understanding.

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. You can renew and pay electronically at <https://eugenenaturalhistorysociety.org/join/annual-membership-payment/>.

### **Volunteers needed for ENHS booth at the Mt. Pisgah Arboretum Mushroom Festival Sunday, 26 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 (especially about our live salamanders!) and meet interesting people. Volunteer shifts are usually 3 hours, but other time commitments are possible. Contact Kim Wollter to sign up: [kwollter@comcast.net](mailto:kwollter@comcast.net)

### **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](#)  
**First Fridays, Oct.–June. Explore the Willamette Confluence.** See the MRT website for more information.  
**Second Saturdays, Mar.–Dec., 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.  
**Sunday, 12 Oct., 1–4pm. Wings on Willamette Bird Festival.** Celebrate World Migratory Bird Day with our friends at the Coast to Cascades Bird Alliance. Join birders of all ages and abilities at Alton Baker Park in Eugene for an afternoon of fun bird-based activities.
- **Native Plant Society of Oregon, Emerald Chapter** <https://emerald.npsoregon.org/>  
**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.  
**Sunday, 26 Oct., 10am–5pm. 2025 Mushroom Festival.** The day will include a mushroom exhibit, live music, guided nature walks, mushroom vendors, food, arts and crafts vendors, displays from local nonprofit organizations, a scarecrow contest, and kids' activities Attendance is limited; tickets are required.
- **Coast to Cascades Bird Alliance** [www.laneadubon.org](http://www.laneadubon.org) or 541-485-BIRD; [maeveanddick@q.com](mailto:maeveanddick@q.com) or 541-343-8664  
**Saturday, 18 Oct., 8–11am. Third Saturday Bird Walk.** For all participants. For more info, contact [tolalla@gmail.com](mailto:tolalla@gmail.com).  
**Saturday, 25 Oct., 10–noon. Bike Path Cleanup.** Meet near Euphoria Chocolate, Stewart and Bertelson, north of West 11th.  
**Tuesday, 28 Oct., 7–9pm. Birdlife and Natural Ecosystems of the South Pacific, Tasmania, and Western Australia.** Presenter: Forest Tomlinson. Zoom and in person, Campbell Community Center, 155 High St., Eugene.
- **Museum of Natural and Cultural History, University of Oregon** <https://mnch.uoregon.edu/museum-home>  
**Ongoing exhibits:** Oregon—Where Past Is Present; Explore Oregon; Roots and Resilience: Chinese American Heritage in Oregon.  
**Thursday, 16 Oct., 2pm. 2025 Great Oregon ShakeOut.** Learn about earthquake safety and how you can be ready if an earthquake strikes.

**Thursday, 6 Nov., 10–11am. There Is No Word for Museum in My Language: An O’odham View of the Art World.**

Can Indigenous artists, curators, and historians resist the colonial narrative of art museums when the museum itself is a colonizer institution? Reflecting on his own experience visiting the museum in the Gila River Indian Community, David Martínez argues that the path to resistance lies in the land itself.

**Thursday, 13 Nov., 6–7pm. Indigenous Currencies reading and book signing.** Join UO Assistant Professor and author Ashley Cordes for a reading from her new book.

- **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.

**Saturday, 18 Oct., 5:30–9pm. Haunted Hike.** Enjoy an hour-long pumpkin-lit hike in Alton Baker Park and meet the entertaining costumed bat, frog, spider, owl, and more. Join us for night-themed activities in the shelter before or after your hike. The event happens rain or moonshine! Preregistration and payment [required online](#).

**Thursday, 23 Oct., 10am–1pm. Whilamut MycoBlitz.** We will walk the trails and search for fungi in the Whilamut Natural Area then document the fungi we find on iNaturalist as a part of the Fall Continental MycoBlitz.

- **Lane County Butterfly Club.** <https://www.lanebutterflies.org/>

**Wednesday, 12 Nov., 7:15–9pm. How Anyone Can Help Butterflies.** Presenter: Vanessa Best.. Hilyard Community Center, 2580 Hilyard St., Eugene.

**ENHS MEMBERSHIP FORM**

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Fill out the form or go to our website (see QR code below) to join; 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](https://www.youtube.com/channel/UCERYzVh9lw9y-nLS_t94BVw)




Red Crossbills (male), Cabin Lake viewing blinds, Deschutes National Forest, near Fort Rock, Oregon.  
Elaine R. Wilson, [www.naturespicsonline.com](http://www.naturespicsonline.com)

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/>

## ENHS Officers and Board Members 2025–2026

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## 2025–2026 Speakers and Topics

19 Sept.	Joe Moll	<b>The Audacity of Perpetuity: Land and Water Conservation in Uncertain Times</b>
17 Oct.	Jamie Cornelius	<b>Amazing Adaptations: How Birds Survive Stormy Weather</b>
21 Nov.	Matt Betts	<b>Research Projects at the H.J. Andrews Experimental Forest</b>
12 Dec.	Paul Bannick	<b>A Year in the Life of North American Woodpeckers</b> (cosponsored with the Coast to Cascades Bird Alliance)
16 Jan.	Marie Tosa	<b>Spotted Skunks</b>
20 Feb.	Leif Karlstrom	<b>Giant Aquifer of the Cascades</b>
20 Mar.	Anne Thompson	<b>Marine Microbiology and Ecology</b>
17 Apr.	Heron Brae	<b>Oak Savannah Communities</b> (cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)
15 May	Samantha Hopkins	<b>The Relationships among Paleontology, Climate Change, and Extinction</b>