## Nature Trails

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# Evolving Mammals on an Active Landscape: <br> Biogeographic History of Oregon's Mammals Over Deep Time 

## Samantha Hopkins

Department of Earth Sciences, Clark Honors College, University of Oregon

Friday, 15 February 2019, 7:30 pm, Room 100 Willamette Hall, UO Campus

Not long after she took her faculty position here at the University of Oregon Samantha Hopkins spoke to the ENHS, but the introduction for that presentation - in September, 2008 - is just a bit out of date. Some things about a person's early life don't change with a few added years, though, so what you'll read here will be a blend of the old and the new.
Born and raised in East Tennessee, Hopkins was encouraged to explore the natural world by her father, a pipefitter with a layman's interest in science. She went to high school in Oak Ridge, Tennessee, the site of Oak Ridge National Laboratory. The public education system there was excellent, so she was well prepared for her undergraduate career at the University of Tennessee. She was close to finishing a biology degree with an emphasis in botany when it became clear that her future husband was having more fun with his geology classes than she was with her plant biology. So, as a lark she signed up for a paleontology class. Within a month she was smitten; these folks did the sort of thing she had learned to love as a child: sleep in a tent and get dirty. A year and a half later she graduated from UT with a double major: biology and geology.
As a graduate student at the University of California, Berkeley she began her specialization in the evolutionary ecology of Aplodontia, a group that contains $A$. rufa, or mountain beaver, the nocturnal burrower and eater of roots that is the bane of commercial foresters. She looked at the fossil array of relatives of mountain beaver, which led to questions about the evolution of burrowing. (She told me the jaw musculature of humans is very similar to that of mountain beavers. Might this explain why as the sap begins to flow in springtime we must suppress our desire to chew on a succulent tree root?)
After completing her PhD, Hopkins taught briefly at Sonoma State University - for six months, up until five days before she gave birth to her daughter. She then accepted a two-year postdoc at Duke University, in the NSF-funded National Evolutionary Synthesis Center, where she was given leave to work on research of her own choosing, with access to talented mentors in various departments - pretty much a dream job for a budding scientist.
But as any postdoc worth her salt would do, Hopkins began applying for permanent jobs shortly after she arrived in Durham and was pleasantly surprised by two offers of permanent
positions. The University of Oregon was her first choice, so she had to decide whether to ask them to hold the position while she finished the second year of her postdoc, or cut her postdoc short by a year and come out to Eugene immediately. Knowing that the John Day fossil beds are a rich trove of the very creatures she wanted to continue studying - a major reason the Oregon offer was her first choice - the decision didn't take long to make. She began her assistant professorship in the Department of
 Geological Sciences here at the University of Oregon in 2007.

One of the several academic hats Hopkins now wears is Associate Dean for Faculty in the UO's Clark Honors College. She is into her second year in this part-time administrative post, in which she acts as a conduit between CHC faculty and higher administrative levels. Hopkins is now an associate professor of geology in the Department of Earth Sciences with a joint appointment in the Clark Honors College; she is also a curator at the U of O Museum of Natural and Cultural History.
Hopkins heads the Vertebrate Paleontology Lab, which focuses on mammalian paleoecology. Since she arrived at the U of O 12 years ago, the paleo program has gained in stature. There is now a critical mass of paleontologists, and they are able to attract quality graduate students. As an indication that the program is coming of age, next month the U of O's paleontology program will host the annual conference of the Western Association of Vertebrate Paleontology. Hopkins said that it has been decades since it was in Oregon.
Hopkins and her crew work on projects ranging from studies of within-lineage evolution to regional community paleoecology, using data from fossils, lithology, stratigraphy, phylogenetics, biogeography and modern organisms. Ground zero for the majority
 of their work is the Oregon desert, but in recent years Hopkins has become involved in a research project in Kyrgyzstan, and she will be telling us about this effort and why she was asked to become part of it. She is clearly excited about this
new project and we are fortunate that we will hear about it in its early stages.
Hopkins and her students fulfill their outreach responsibilities in a variety of ways. Hopkins herself gives talks such as the one she will present to us, as well as making presentations at local and national meetings. Her students present their work in poster form at meetings, and some get involved in other science-related activities. For instance, Dana Reuter, a PhD student in the lab, has spent the last year as one of the University of Oregon Women in Graduate Science outreach co-chairs. She got to design and implement fun science events for kids of all ages.

This is what Hopkins gave me when I asked her for a synopsis of what she will talk to us about: "Oregon has been a tectonically active landscape for tens (and
arguably hundreds) of millions of years with earthquakes, landslides and volcanoes a constant perturbation to the physical environment. That dynamic context has shaped Oregon's evolving mammal fauna, and the phenomenal record of mammalian evolution preserved in central and eastern Oregon shows us how this fauna has changed through time. Hopkins will talk about the changes in phylogeny and ecology of mammals over deep time." Please join us at 7:30 pm on Friday, 15 February, in room 100 Willamette Hall on the UO campus for "Evolving mammals on an active landscape: biogeographic history of Oregon's terrestrial mammals over deep time." There will be treats. John Carter

## Bewildered by John Carter

I look down the steep slope to where Charlie is kneeling near a choice specimen and hear him holler something like "Is there a prettier sight than this bit of gold coming out of the duff?" We had left his rig, parked on an abandoned logging road, moments before and were intent on our quarry, he carrying his fancy basket, me my plastic shopping bag. Working uphill, staying a few feet down slope from the old road, I come upon a chanterelle every now and again, often enough to keep my mind totally focused on the hunt, forgetful of all else, including the whereabouts of my hunting partner.

Charlie has it right, seeing a chanterelle mushroom on the forest floor is a gift. Making my way through the ferns and salal and Oregon grape, sometimes using one or another of these understory plants as a brace to keep from sliding further downhill, under a canopy mostly made up of Douglas-fir, there are many false alarms. Something, yellow-gold, over there. Is it a mushroom? A few steps closer and no, just a leaf. What about that? It's definitely a mushroom, sort of yellow ... no. Then I see the jewel-like glow and from 20 feet away I know instantly with complete certainty that there is another morsel for the bag. This aha moment has more than once led me to wonder how my being makes this blink-of-an-eye judgment. No chanterelle mushroom looks exactly like another one, and yet after you've harvested several there's something almost primitive about how you just know when you see one. And when you find one and get down to its level to harvest it, a careful survey of nearby terrain often rewards you with another one, hidden from above but noticeable when you're at almost ground level. Sometimes there's no hint of color, just a break in the duff to indicate something trying to emerge; uncover
it and there's another one. The game becomes mesmerizing, hypnotic.
And so it was that when I came out of my trance many minutes later I felt a vague disquiet. Charlie was nowhere to be seen and didn't answer my holler. My bag was comfortably full but had still a lot of room, so I headed up the hill to intersect the road and so make my way back down the hill to find Charlie and the vehicle. As I went up I kept finding the occasional fungus but I never found what I considered a road like the one we had parked on. So I kept going up.

Daniel Boone once said: "I can't say as ever I was lost, but I once was bewildered for three days." On this day my sense of bewilderment started settling in after about two hours, when it became abundantly clear I should have crossed the logging road long ago. Our plan had been to stay for just long enough to score some mushrooms and then continue our journey over to the coast, where we were going to spend the weekend with our poker group. I knew Charlie was worried at this point. I was overdue, and he probably thought I had fallen and hurt myself. He knew that I'd already run 8 miles that morning, that although I had a rain shell and rain pants I wasn't really geared up for an overnight in this steep country, and that I was an old man. An old man in good physical shape, but still, an old man, and one he had a certain responsibility for. And I knew Charlie, knew that his mind was full of the myriad ways a person can get hurt in such difficult terrain, and that he was getting more frantic the longer this went on.

So my quest shifted from the single-minded hunt for mushrooms that had led to my situation, to getting myself unbewildered. After another hour or so I gave up on finding the rig. It was obvious I'd crossed into a different drainage and that I could wander around in
this really steep country until dark without finding my partner or the vehicle. Being out overnight would've been uncomfortable but doable; it was fairly warm, I had rain gear, and lots of mushrooms to eat. But at this point I was much more concerned about the state of mind of my partner than of a night in the woods. So I began thinking about how to get news to him. I knew that if I just went downhill I would eventually get back to the main road, even though it was several miles away, so I switched gears and started going down. Soon I found a well-traveled road, met some road-hunting deer hunters who told me the shortest route to take to get back down to Alsea Falls State Park, and I set off, knowing all the time that Charlie was going nuts. I had no idea what I would find when I got down. My hope was to be able to stop someone and use his or her phone -I was still a Luddite then - to call Kris, who could call Cathy, who could call Charlie. But I realized I might not find anybody and so I might have to hike all the way to the town of Alsea. All these thoughts (but not the possibility that there would be no cell service, which was the case!) were percolating as I clumped downhill in my wellies. After a steep, long hike in wellies the very real possibility that my hike was only about half over was discomfiting, to say the least.
Long story short, about five hours after we had parted company Charlie and I came back together, at a parking lot down by the road past Alsea Falls. And then I found out just how far he had tried to move heaven and earth to find me. A sheriff was also there waiting for me - the sheriff Charlie had commandeered from high up the mountainside, where he could get cell service. They had already
been up and down the mountain a couple of times, but their intensity had slacked off when they found the deer hunters - who were where they weren't supposed to be, which is why the sheriff stopped them. The hunters said they had talked to me, that I was not hurt and just had a long walk ahead of me.
After the sheriff asked me the requisite questions so he could complete his incident report (!) he hung around to share stories of the strange cases a rural sheriff gets involved in. Fascinating stuff, but we were now eager to get on with our long-interrupted journey to the coast. Once the sheriff wished us well and said goodbye, we went maybe five miles down the road to where Charlie's phone would work. He stopped and called our crew, all of whom were already at the destination, to let them know that the lost had been found and we would indeed be there before the night was over. I dreaded the reaction awaiting me, and my worst fears were confirmed as soon as I entered the house. These guys are sharp even without ammunition, and I spent the entire weekend being the butt of all jokes. Of course, that was just the beginning. Now, years after my bewilderment, every once in awhile it gets brought up again.
I've been out shrooming several times since then, both with someone else and alone. But now I always have a fanny pack with a compass, flashlight, lighter, multi-tool, whistle, emergency blanket, and gps. One lesson that afternoon taught me is that overconfidence can be dangerous. Being confident of my ability to thrive alone in the wild is fine, but I need also to be humble. If Daniel Boone could get bewildered, so can I. So can we all.

## Common Mosses of Western Oregon and Washington

Bruce McCune and Martin Hutten. 2018. Wild Blueberry Media, Corvallis, Oregon ISBN 978-0-9987108-2-2. \$40 from www.wildblueberry.net

## Book Review by David Wagner

Few people would be as excited as I was when I first got this book in my hands. Even though mosses are just background color to most, this book is sufficiently ground breaking that it warrants a close look. This is the first book I have found that uses modern digital photography to make identification of our common mosses easy for the neophyte. The hundreds of high quality photos are what make this book so wonderful, many of them taken through a
microscope. These photomicrographs provide the detail needed for positive identification.
Like most identification books, traditional dichotomous keys are used to guide one through the process. Each step in a dichotomous key consists of two contrasting descriptive statements. These two statements are called a couplet. Each individual statement in a couplet is a lead. All of the features used in the couplets are illustrated with photographs. The critical photos are indexed after each lead. The photos referenced in the keys are often supplemented by instructional photos that illustrate similar kinds of features to help understand the key descriptions.
The authors have generated keys based on features that are generally easy to use. They have separated coherent groups of species into smaller keys. The first part of the introductory key emphasizes sorting out the groups of mosses that can be recognized by
examination with the naked eye or a hand lens. These are the large, showy species such as the forest floor mosses. It is always a good idea to pick out the easily recognized species first.
This book takes a bit of study for a beginner to get a feeling for the style of writing. The instructional chapters are well crafted, including an illustrated glossary. These will make keying go smoothly. I like that the easier keys are near the front of the book and the harder ones near the end. The coverage of the area is better than the title, "Common Mosses of Western Oregon and Washington" implies. There are 200 species in 100 genera covered in this book, a significant portion of the 500 or so species known from Oregon. The crispness of the images - 529 pictures on 146 pages - is remarkable. The photomicrographs of leaf cells are stunning, precisely what is needed to compare with a specimen on your slide. All are clearly labeled, many with a scale bar.
After the easy groups are separated out, the book cannot be used effectively without having and
knowing how to use a compound microscope. This is not a bad thing. Decent binocular microscopes are available for about $\$ 200$. Microscopy is a traditional activity that should have more followers. The beauty of the photomicrographs in this book will generate interest to learn how to make slide preparations of moss leaves.
Eventually, one must learn how to cut thin sections of moss leaves. Each of the two authors has a personal style of making thin sections. This is not

unusual as many moss students have a personal style of making freehand sections. Like many, I believe my method is better than Bruce or Martin's because it requires no special equipment, is easy to teach and produces good sections. Even without microscopy, however, all who appreciate this Lilliputian world will enjoy this book.

On behalf of the members of the Eugene Natural History Society, your board sent a letter to the Department of State Lands detailing the reasons why ENHS strongly opposes a dredge and fill permit for construction of the Jordan Cove Liquid Natural Gas terminal and associated shipping lanes near Coos Bay.

## Events of Interest in the Community

## McKenzie River Trust

Wednesday, 20 February, 9:30 am - $\mathbf{1 2} \mathbf{~ p m}$. Watershed Warriors at Green Island. Join the Watershed Warriors as we tackle invasive species, restore local habitats, plant and care for trees, and connect to local lands throughout Lane County! Every First and Third Wednesday, we will be in the field working to improve the health of our watersheds. Throughout the year, we will visit multiple sites. From wetlands to upland forests, join us in experiencing the diversity of Oregon's lands and rivers! For a map to Green Island, go to https://www.mckenzieriver.org/events/list/watershed-warriors-at-green-island/
Saturday, 23 February, 10 am - 12:30pm. Family Volunteer Day at Green Island. Join McKenzie River Trust at Green Island for Family Volunteer Day! We will begin the day tackling invasive species, planting new trees and shrubs and mulching young plantings. We'll end the day with a nature walk to explore the area. Projects fit a wide variety of ages and abilities so bring the whole family, young and old!
Friday, $\mathbf{1}$ March, $\mathbf{1 0} \mathbf{a m} \mathbf{- 2} \mathbf{~ p m}$. Friends of Finn Rock Reach. Help protect and care for the iconic Finn Rock Reach property! Join the Friends of Finn Rock Reach at the Finn Rock boat landing to remove invasive species, manage trash, and maintain trails while being a part of a community dedicated to recreation, retreat, and wonder in the natural world. For a map go to https://www.mckenzieriver.org/events/list/friends-of-finn-rock-reach-friday-march-1st/

## Lane County Audubon Society

Tuesday, 26 February, 7:30 pm. Bees: Weird, Wonderful, and So Essential! Sarah Kincaid. Oregon has 500 species of bees, including four species that are actively managed in ingenious ways for crop pollination. Come and learn who these bees are and some of the weird and wonderful features of their lives. The talk will focus on concepts for creating and maintaining bee habitat in a backyard setting, and will introduce the audience to a number of state-run initiatives to protect bees. Kincaid is an entomologist and pollinator specialist in the Insect, Pest, Prevention, and Management Program with the Oregon Department of Agriculture. She is a co-founder and ODA project lead for the Oregon Bee Project, which brings together state agencies, farmers, and conservationists to protect and promote Oregon bee species vital to the state's agricultural and native landscapes. 1645 High St.

## Mt. Pisgah Arboretum

Saturday, 9 February, 10am - 12pm. Life Among the Mosses Walk. This is our annual celebration of the little folks of the plant world. Botanist David Wagner will tell moss stories and weave lichen yarns to help us understand the elfin world of mosses, liverworts, and lichens. Rain or shine. Meet at the Arboretum's Visitor Center. Don't forget your parking pass. Fee: \$5, Members free.
Sunday, 10 February, 8:30 - 11am. Bird Walk. Join Joni Dawning and Julia Siporin for another monthly bird walk intended for people with all levels of birding experience. We'll use vocalizations, habitat, and behavior clues for identification of our winter and year-round residents. Come discover the Arboretum's avian diversity. Please bring binoculars. Option to continue the walk until noon for those who are interested. Rain or shine. Meet at the Arboretum Visitor Center. Don't forget your parking pass. $\$ 5$, members free.
Saturday, 16 February, 10 am - $\mathbf{1 2}$ pm. Lichen Walk. Join lichenologist Daphne Stone on this popular walk through the Arboretum exploring lichens, their habitats, and ecology. Learn a few names and enjoy the moist winter air that makes the Pacific Northwest such a great place for lichens to grow. Rain or shine. Meet at the Arboretum Visitor Center. Don't forget your parking pass. \$5, members free.
Saturday, 2 March, 12 - 4pm. Winter Buds Illustration Workshop. Most of us think of plant dormancy as an inactive time, and generally that's correct. However the twigs we see are busy arranging next year's display. The shapes, color and detail in twigs are quite amazing! Draw and study twigs from various trees and learn about how growth is organized, with local illustrator and former Arboretum festival poster artist, Kris Kirkeby. Adding a little simple shading will help these twigs become even more attractive. What a great winter activity! Supplies: 2B, 2H, 4H graphite pencils, kneaded eraser, white vinyl eraser, pencil sharpener, sketchbook $-5 \times 7$ or $8 \times 10$, and a small flashlight to illuminate subjects. Members: $\$ 30$, Nonmembers: $\$ 35$. Meet at the Arboretum Visitor Center Don’t forget your parking pass. Pre-registration required. Call (541) 7473817 to register or visit http://www.mountpisgaharboretum.com/workshop-registration/
Saturday, 9 March, 11 am - 1pm. Flies and Flowers Walk. Join Arboretum Interpretation Coordinator August Jackson on a walk to explore the important role of flies in the pollination of our early wildflowers. Learn about the process of pollination, learn the names and ecology of some of our colorful native flies, and learn to identify our early spring wildflowers. Rain or shine. Meet at the Arboretum Visitor Center. Don't forget your parking pass. \$5, members free.

Friends of Buford Park and Mt. Pisgah
Monday Morning Regulars. 9 am-12 pm. Contact volunteer@bufordpark.org for more information.
Tuesdays and Thursdays, 9 am- $\mathbf{1 2}$ pm. Nursery Work. Meet and work at the Native Plant Nursery at Buford Park. Enter Buford Park from Seavey Loop Road. Turn LEFT after crossing the bridge and drive $1 / 4$ mile to the nursery.

## WREN (Willamette Resources and Educational Network)

Tuesday, 12 February, 9 - 11 am. Wetland Wander. Join WREN and BLM staff for a 3 - 4 mile hike at the See Sil site. See Sil is comprised of white and black oak savanna, upland, and wet prairie ecosystems. We will talk about some of the recent projects, such as the prescribed burn, look for signs of the acorn woodpecker colony that inhabits the site, and explore other seasonal changes. Conditions are wet, muddy, and hummocky. Please come prepared with appropriate footwear and bring binoculars. Participants are asked to meet at the west end of Royal Ave near the gravel parking lot. Directions: Take Royal Avenue west to the ODFW parking lot at Fern Ridge Reservoir. If you have an ODFW permit you may park in the lot, otherwise park along Royal Ave. The site is on the north side of Royal, to the east of the house near the end of the road; look for the gate with BLM signage, and WREN staff.

The University of Oregon's Museum of Natural and Cultural History
Tuesday, 12 February, 12 - 5 pm. Happy Birthday, Darwin! Join us in celebrating Charles Darwin's birthday—and his legacy of scientific curiosity-with an afternoon of special Science Walk \& Talks, plus birthday cupcakes! Walk \& Talks begin at noon, 1:00, 2:00, and $3: 00 \mathrm{pm}$ and are included with regular admission. The event is free for MNCH members and UO ID Card holders. Oregon Trail cardholders are admitted at a reduced rate through the Museums for all programs. Visit naturalhistory.uoregon.edu for details.
Friday, 15 February, 5:30 pm. Secret Lives of Flying Dinosaurs with University of Texas - Austin paleontologist Julia Clarke. How did dinosaurs get feathers? What did their feathers look like? Join Julia Clarke in exploring the evolution of feathers and flight in dinosaurs - and examine recent fossil discoveries that are changing scientists' views on how these ancient creatures looked. (But be sure to leave in time for the ENHS talk!)
Thursday, 21 February, 6 - 9 pm. Museum After Hours. A 21+ Evening at the Museum. Tired of adulting? Grab your friends and unwind at Museum After Hours! Get your science and your drink on at this dino-mite soirée, featuring live music by Ray Troll and the Ratfish Wranglers. Enjoy tasty food and adult beverages, explore the new Dinosaurs Take Flight exhibit, get crafty with fossils, and face off in a paper-airplane contest.
Saturday, 23 February, 11 am - $\mathbf{3}$ pm. Winter Family Day FLYING FEATHERED DINOS! Giant reptiles once roamed the land and swam the sea, but did you know they also flew through the skies? Come celebrate these ancient feathered animals and explore their relationships to modern birds. The whole family will enjoy games, activities, crafts, and performances-all included with regular museum admission! Admission is half-price for families presenting Oregon Trail cards, and free for MNCH members. Not a member yet? Family memberships are 20 percent off during family day!

Current Exhibits: OREGON - WHERE PAST IS PRESENT; EXPLORE OREGON; THE COLUMBIAN MAMMOTHS, and AR-TI-FACT. Exhibit hours: Tuesdays - Sundays $11 \mathrm{am}-5 \mathrm{pm}$.
Native Plant Society of Oregon, Emerald Chapter
Monday, 18 February, 7 pm. Wildflowers of the Northern Arizona Mountains. Dan Luoma and Joyce Eberhart will share their botanical exploration of the mountains of Northern Arizona, including Boynton Canyon, Secret Mountain, and the San Francisco Peaks. Northern Arizona is well known for the stunning summer wildflowers that emerge in response to monsoon rains. Please join us for this sampling of the plant geography of a highly diverse region. Amazon Community Center, 2700 Hilyard St., Eugene. http://emerald.npsoregon.org/
We want you! If you have leadership or coordination experience, are looking to build your resume or enjoy sharing your knowledge of native plants, we want to hear from you! The Emerald Chapter is currently seeking officers to join our active board. Positions include president, vice president, secretary and publicity and field trip committee chairs. If interested, please send an email to em_president @npsoregon.org.

## Nearby Nature

Tuesday, 12 February, 10 - 11:30 am. Green Start: Noisy Nature. Enjoy outdoor nature play in our Learnscape plus toddler and pre-school activities and stories. Rain or shine! Kids 5 and under only, with an adult. Members free, non-members \$5. Preregister online or call 541-687-9699. Learnscape, 622 Day Island Road.
Monday, 18 February 8:30 am - 3:00 pm. Nature's Busy Builders No School Day Adventure. Enjoy a building adventure in nature nearby. Make a bird nest and your own fairy fort or gnome home. Go on an animal homes scavenger hunt and create your own fort from our Nature's Builders Playspace super blocks. $\$ 45$ members, $\$ 50$ non-members. Scholarships available. Ages 6-9, max 12 kids. Outdoors in Alton Baker Park and at our Yurt. NEW! After care is available from $3-4$ pm. Register online or call 541-687-9699, ext. 2. Register now. Learnscape, 622 Day Island Road.
North American Butterfly Association, Oregon (Eugene/Springfield) Chapter
For information on upcoming events go to https://www.naba.org/chapters/nabaes/


ENHS welcomes new members! To join, fill out the form below. Membership payments allow us to give modest honoraria to our speakers, as well as to pay for the publication and mailing of Nature Trails. Our web address: http://biology.uoregon.edu/enhs

## MEMBERSHIP FORM

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The Eugene Natural History Society meets on the third Friday of the month September through May except in December when the meeting is on the second Friday. Meeting time is $7: 30 \mathrm{pm}$ and our standard meeting location is room 100 Willamette Hall on the University of Oregon Campus. Any temporary changes will be noted in the newsletter for the current meeting and on our website: https://pages.uoregon.edu/enhs/

A good place to park for our meetings is the Physical Plant lot: turn north from Franklin onto Onyx, go about a block and you will be in the lot. After 6 pm it's open to the public.

## ENHS. Officers and Board Members 2017-2018

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Nature Trails: Editor: John Carter, jvernoncarter@comcast.net; Support Staff: Ruth BreMiller and Reida Kimmel.

## 2018-2019 Speakers and Titles

| 15 Feb. | Samantha Hopkins | Evolving Mammals on an Active Landscape: <br> Biogeographic History of Oregon's Mammals Over Deep Time <br> Burning for Butterflies, Birds, and Blooms: <br> Prescribed Fire in the Willamette Valley |
| :--- | :--- | :--- |
| 15 Mar. | Amanda Stamper | Cataclysms on the Columbia: The Great Missoula Floods |
| 19 Apr. | Scott Burns | How Busy are Beavers in Oregon? |

