Nature Trails

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The Clam Garden Network: Exploring the Social and Ecological Contexts of Clam Management in the Past, Present, and Future



Dana Lepofsky

Department of Archaeology, Simon Fraser University Burnaby, British Columbia, Canada

Friday, 21 January 2022, 7:30 p.m.

The Eugene Natural History Society invites you to their January Zoom meeting. The Zoom meeting will open at 7:00, but our meeting will begin at 7:30. This allows everyone time to get connected and join in friendly conversation. Time: 21 January 2022, 07:00 p.m. Pacific Time (US and Canada). Join Zoom Meeting: https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09

We had hoped to return to 100 Willamette this year, but given the current state of the pandemic, the Eugene Natural History Society will continue to hold meetings via Zoom until it is safe to meet in person. We will use the same link for each meeting unless otherwise noted. The current link can always be found at eugenenaturalhistorysociety.org. Thank you for your continued support!—August Jackson, President, ENHS

Clam gardens are new to us who are only recently present here in the Pacific Northwest but very old to the Indigenous Peoples who started building them at least 4000 years ago. Dana Lepofsky, our speaker this month, has learned about them from First Peoples elders and from her own archaeological research. Her approach to understanding these and other ancient but sophisticated management methods is respectful of those who conceived and developed them. She is committed to helping communities reconnect with these practices today.

Lepofsky is a Professor in the Department of Archaeology at Simon Fraser University, Burnaby, British Columbia, Canada. She was born and raised in Norwalk, Connecticut, almost within shouting distance of New York City. Her father was a University of Michigan alumnus, and she elected to follow in his footsteps. Her mother feared that this geographic leap would lead her daughter farther and farther away from her natal home. Her mother was right.

At Michigan, Lepofsky studied anthropology and archaeology. She was unaware when she began there that she had landed in the best place in North America for this discipline. Her mentor was Richard Ford, a leader in ethnoecology. After graduating with a BA degree in archaeology Lepofsky lived for a year in the Pueblo of Zuni in New Mexico. There she was immersed in a deep, strong community with ancient roots, influencing her later professional life.

Lepofsky went to the University of British Columbia for her MA degree. Why? Her boyfriend had bought a tent and suggested that they take a backpacking trip together. Growing up in Norwalk she had never seen a tent, let alone slept in one. They went to the Olympic Peninsula in Washington. She was so sore after a short stint that they took the ferry from Port Angeles to Victoria so she could recover. They went to the Royal BC Museum. She said she was absolutely blown away by the massive carvings in the First Peoples Gallery of Nuu-chah-nulth whalers. That experience started her on her path. Her MA research focused on a traditional food project with the Nuxalk of Bella Coola, British Columbia, run by her mentor Dr. Harriet Kuhnlein. In Bella Coola, she learned the fundamentals of ethnobotany and ethnoecology and in particular learned much from her Indigenous collaborators and teachers. While common practice in the field of ethnoecology at the time, working collaboratively with Indigenous knowledge holders was not widely practiced among archaeologists.

Toward the end of her four-year study, she attended a talk in Seattle by her undergraduate

mentor Richard Ford. At the time, he asked her why she didn't yet have her PhD degree. She hemmed and hawed. He then introduced her to Patrick Kirch, whose archaeological work in Polynesia was well known. He told Kirch he should be Lepofsky's PhD advisor. Lepofsky then had the temerity to ask Kirch if he would direct her PhD study in coastal British Columbia. He said, essentially, "Why would I want to do that?" So Lepofsky found herself doing research on traditional agriculture in New Guinea and Polynesia and following Kirch to UC Berkeley where she got her degree. Shortly after finishing at Cal, she got the job at Simon Fraser University, where she has been since 1995.

The focus of Lepofsky's research program at

SFU continues to be the Indigenous Peoples of the Northwest Pacific Coast: their cultural histories and how they have interacted with the land they still call home. Her work has led to a reexamination of this history by anthropologists.



Natural systems in this region have been sustainably utilized for millennia by Indigenous Peoples. Lepofsky's tireless efforts and willingness to listen to and learn from the Elders have helped lend long overdue credence to the traditional ecological knowledge of Indigenous Peoples.

Lepofsky has served as president of the Society of Ethnobiology and has been editor-in-chief of the Journal of Ethnobiology since 2013. She has received a number of awards in recognition of her engagement with Indigenous communities. Here is her statement of her research interests and methods: "I am interested in the social and ecological impacts of past human interactions with their environment. I work primarily in the Northwest Coast, in the traditional territories of and in collaboration with several First Nations. I incorporate diverse technical and methodological approaches in my research, including interviews with knowledge holders, ethnohistoric research, geomorphology, archaeological survey and excavation, paleoethnobotany, and paleoecology. My recognition of the value of different disciplines and kinds of knowledge has led me to believe strongly in multidisciplinary and collaborative research. My research program has been strengthened considerably by my association with other archaeologists, paleoand neo-ecologists, geomorphologists, and experts in First Nations traditional knowledge. With my students, I am working on several projects, broadly focused on exploring how Northwest Coast peoples lived and live with their land and seascapes. My team seeks to blend local ecological and historical knowledge with archaeological data to understand these interactions and, when possible, to apply this knowledge to current issues. I am particularly interested in the role of culturally valued species and places (cultural keystone species and places) in past and current social and ecological contexts."

Here is her summary of what she will talk to us about. "For millennia, Indigenous peoples of the Northwest Coast tended clams in clam gardens—rock-fronted terraces constructed in the intertidal to maintain and increase clam populations. The Clam Garden Network (www.clamgarden.com) is a

Restoration Activities at Amazon Prairie Mitigation Bank by Shelly Miller

The City of Eugene Parks and Open Space Division, where I work, has operated a wetland mitigation bank program for over 25 years. It is the only mitigation bank managed by local government in Oregon and one of the few in the United States. The program has funded hundreds of acres of wetland restoration in the Eugene area, including parts of the West Eugene Wetlands, Coyote Prairie (Cantrell Road), and the latest project at Amazon Prairie (southeast corner of Goodman and Bond Roads near Clear Lake).



Photo from Coyote Prairie (June 2021). This is an example of a restored vernal pool with a diverse plant community, including popcorn flower (white) and Dowingia (purple).

A couple of years ago, Eugene Parks and Open Space began work on its latest wetland mitigation bank: Amazon Prairie. This 329-acre property (former rye grass field) was purchased in 2019 primarily using funding generated by the credits sold at other Eugene mitigation banks such as Coyote

consortium of people who are documenting the socioecological context of clam gardens in the past and present. In this talk, I describe what we have learned about the development, distribution, age, and ecological workings of clam gardens. We situate this discussion in the broader context of human-clam relationships from the end of the Pleistocene to today."

I hope all who read this will become as eager as I am to hear Dana Lepofsky's presentation: The Clam Garden Network: Exploring the Social and Ecological Contexts of Clam Management in the Past, Present, and Future. Please join the Zoom meeting on Friday, 21 January 2022. The link is on the cover page of this issue and will open at 7:00 p.m. to allow time for getting connected and for casual conversation. The meeting will begin at 7:30.

John Carter

Prairie. Since acquisition, City staff have been developing plans for a phased restoration of this property. At Amazon Prairie we have an exceptional opportunity to restore wet prairie, riparian natural communities, and adjoining upland prairie across over 300 acres. These habitats have been severely impacted since Euro-American settlement by development and agriculture, loss of fire, and hydrologic modification. It is estimated that less than 5% of these habitats remain in the Willamette Valley.

You might be wondering what a wetland mitigation bank is. Compensatory wetland mitigation banking is closely regulated by the U.S. Army Corps of Engineers and the Oregon Department of State Lands. People conducting work that will fill or remove wetland habitat are required to compensate for that loss when the loss if above a certain threshold. One of the ways people can compensate for lost wetland habitat is by purchasing credits from a mitigation bank. In most cases, there is a one-to-one relationship between the acreage lost and the credits purchased.

The mitigation banker (public or private) conducts stewardship activities on a parcel of land to protect, enhance, restore, or create wetlands. There are some specific definitions of what those words mean in regulatory terms, but at a minimum a banker must restore or enhance at least two acres of wetland to generate a credit that they can sell to people or businesses with a permitted wetland loss due to their activities. So, for every wetland acre lost to development, at least two would have been enhanced at the bank property. Wetland mitigation can be controversial. Nationally and here in Oregon recent efforts have been undertaken to improve the

replacement of not only acreage lost but the quality functions and values of the wetlands.

One of our primary goals for restoration at Amazon Prairie is to provide or enhance wetland functions and values. However, the City of Eugene takes a multiobjective approach to mitigation banking, recognizing the positive effects that wetland restoration can have on biodiversity, ecosystem services, and the quality of life for people of the Willamette Valley and the Amazon Creek watershed. Additional goals include:

- 1) Supporting conservation goals of the Rivers to Ridges Partnership, the Oregon Conservation Strategy, and the Willamette Valley Oak-Prairie Cooperative's Strategic Action Plan, including the protection and restoration of a large regional integrated network of wetland and upland ecosystems and associated species.
- 2) Establishing a diverse mosaic of Willamette Valley wetland and upland prairie and contribute, as possible, to the conservation and recovery of listed and rare species in the area such as the western meadowlark, Bradshaw's lomatium, Kincaid's lupine, Willamette navarretia, racemed goldenweed, Fender's blue butterfly, and the northwestern pond turtle.
- 3) Provide important ecosystem services to the region including flood storage capacity, water quality enhancement, climate attenuation, air quality enhancement, soil stabilization, nitrate and phosphorus retention, and pollinator support.
- 4) Provide opportunities for compatible, natureoriented recreation such as hiking and nature viewing, outdoor education, and interpretation.
- 5) Provide opportunities to advance our collective knowledge and understanding of ecology and restoration through research.

This past summer and early fall we reached an exciting milestone. Earth-moving equipment was deployed to create eighteen shallow vernal pools, fill in agricultural ditches, and remove fill piles on wetland habitat across approximately 148 acres of the site—phase 1 of the restoration. To begin to restore native wet and upland prairie plant communities, over 500 pounds of seed, 2,800 bulbs, and 2,000 potted and bare root plants representing more than 40 native species have been distributed across much of the 148 acres. Plant species were chosen for a variety of reasons including production of flower, seed, and fruit resources on the site throughout the season. We selected a suite of species that will provide pollen and nectar during early, mid, and late pollination seasons and provide diverse flower shapes, sizes, and colors to support a wide array of pollinators and other fauna.

Species that were seeded include popcorn flower (*Plagibothrys figuratus*), a white fragrant annual that provides early nectar and pollen resources for native bees; Willamette gumplant (*Grindelia integrifolia* x nana), a perennial late-flowering species that provides nectar and pollen for native bees; and smooth goldfields (*Lasthenia glaberrima*), an annual vernal pool in the aster family (this plant is endangered in Canada).

Species planted as bulbs include slim-leaf onion (Allium amplectens) and great camas (Cammassia leichtlinii var. suksdorfii). Some species were installed as potted plants and may have also been seeded. These include rose checkermallow (Sidalcea virgata); narrow-leaved mule's ear (Wyethia angustifolia), a perennial with large golden flowers in the aster family; Sierra rush (Juncus nevadensis), salvaged from the site prior to earthwork; and narrow-leaved milkweed (Asclepias fascicularis), an important host for monarch butterflies.

Highly mobile animal species are already using the site. Because the site is quite open and bare, we are seeing a lot of shorebirds and a few streaked horned larks. Species composition will change as the vegetation grows in the coming years, and these species will largely be replaced by songbirds and raptors. Flocks of great egrets regularly use the site. Northern red-legged frogs have been found on site near Amazon Creek. We expect populations of frogs, salamanders, and snakes will increase over time. Northwestern pond turtles have also been observed nearby. During phase 2, we hope to enhance the riparian area to support turtles. Western meadowlarks, grasshopper sparrows, short-eared owls, and many raptor species frequent other City mitigation bank sites. We anticipate the same results for Amazon Prairie with perhaps opportunities for more biodiversity with the broader range of available habitat.

What's next?

State and federal regulations for mitigation banks require us to monitor and meet certain performance standards over at least five years. These standards include measures of native plant diversity, total plant cover, and invasive species cover. We also must monitor site hydrology—the amount of water on site and how long it remains. City staff will be continuing restoration efforts in phase 1 while managing and monitoring the site for these standards. The property for phase 2 (approximately 180 acres) will continue to be leased to a grass seed farmer until we have the capacity to take on an earthwork and intensive restoration, likely two to three years from now.

The site is closed to public access because it is still an active farm, and restoration has only just

begun. I invite you to drive by and walk along Bond Road to see what we have been up to and track the progress of the site over the next several years.

Some additional information is available on our web site: https://www.eugene-or.gov/4777/Amazon-Prairie-Mitigation-Bank

Grass by Reida Kimmel

As years pass and the earth gets closer to being irretrievably locked into a permanent global heatwave, we should look for help from the very planet that we have so abused. Right now, we are not doing so well. Forests composed of mature and ancient trees are efficient carbon sinks. Even in death the slowly decaying wood retains its precious carbon content for decades. But we log our mature forests, removing all but the carbon in the milled lumber. Roots of cut-down trees, once carbon sinks, become sources. We tear up the soil, releasing more carbon. We plant millions of tiny replacement trees, which are no replacement, only invitations to catastrophic fires that spew carbon dioxide and cocktails of other gasses into the atmosphere. The fertile earth then becomes a parched, poor land, poor for people and wild creatures. Peat, the major builder of soil and sculptor of the earth in both colder regions and tropical forests, is a huge planetary-scale carbon sink. It, too, is seriously threatened—in colder climates by warming, drying, and wildfires and elsewhere by agriculture. Tropical and subtropical forests are levelled and plowed for soybean plantations and cattle ranches and to grow luxury crops such as coffee, palm oil, and cacao, satisfying rich nations' greed. As the oceans that cover much of the planet warm and acidify, their ability to absorb and store carbon decreases. Humanity is complicit. We all exploit the planet to satisfy our wishes.

Recently, research and mitigation have focused on a new bright light, another offering from our planet. Grass. Because of the way they photosynthesize, most native prairie grasses are more heat and drought tolerant than the majority of plants on earth. Their importance will grow as the earth warms and dries. They are perennial and have dense, fibrous networks of roots going many feet deep into the soil to recycle nutrients, conserve water, and store carbon. Four-fifths of a mature grass plant lives below the ground. Plowing the earth not only kills grass plants, it causes the torn roots to release that stored carbon. Joe Fargione, science director for the Nature Conservancy N.A., estimates that we lose thirty percent of the carbon stored by grasses when we plow up the top twelve inches of sod. Unlike forests, however, grass thrives on disturbance above ground. Grazing, in moderation, is the perfect disturbance. Grazing stimulates new vegetative

growth. The odd- and even-toed ungulates that have browsed grasslands since their origins in the Oligocene and Miocene promote a balance of plant types and species, rich in diversity and appropriate for local soils and microclimates.

Native grasslands once were important constituents of the environment stretching across the width of our nation, from the salt marsh pastures of the East Coast, now mostly covered by houses, cities, and roads, across the tallgrass and shortgrass prairies of the Midwest, to the grassland marshes of the western river deltas. All are unique, diverse, but endangered ecosystems.

Our tallgrass prairies are the nation's and the world's bread basket. Yet, very little of their original grassland vegetation remains. Where flooding is a regular occurrence, these areas are marginal for farming. Thus, restoring wet-loving grasslands and their associated flora will not only store carbon, it will mitigate flooding and erosion and provide habitat for disappearing species of birds and insects.

For decades, we have known that America's shortgrass prairies were shrinking drastically because farmers were plowing up native grasslands only marginal for crops even as the West became hotter and more arid. But importantly, much of the shortgrass prairie still has never been plowed. Its ancient native grasses remain as livestock pasture or are reserved in parks and wilderness. Shortgrass prairies may seem bleak and deprived to an observer, but their grasses are storing masses of carbon in ecosystems as rich as any in the tallgrass prairies, while they feed myriad creatures—including us.



By increasing the acreage of land in native grasses we will not only be protecting species, we will also be enhancing the carbon storage that the planet so desperately needs. Shortgrass prairies are a prime choice for effecting strategies to do just that. Most of the remaining prairie lands are privately owned and used for grazing, belong to and are leased out by the Bureau of Land Management, or are tribal lands. Private owners must be involved in decision making and restoration. The decision to keep prairie land as grazing land is considered the best approach, with a goal of preventing further soil disturbance. The land should be grazed, but responsibly, a solution not always easy to enforce. Restoring an area to native grassland is almost impossible once it has been converted to cropland, but the USDA's Natural Resources Conservation Service is aiding ranchers in improving soils and water quality and with planting native perennial vegetation. Since 2010, more than ten million acres have been protected, with 3,261 ranchers participating. The Agency plans to protect 9.8 million acres more of the Great Plains by 2025. The USDA's Conservation Reserve Program pays farmers to take land out of crop production and plant perennial grasses, a winning solution for farmers, especially if they are getting paid to stop farming marginal land. Not surprisingly, populations of grassland birds, and presumably of plant and beneficial insect species, have grown on protected and mitigated lands.

One deeply meaningful aspect of grassland protection is the role that Native Americans are

playing on their lands. "Treaties" gave them the poorest of the poor land. On this land Native Americans were expected to become farmers, an expectation that if realized would destroy millenniaold beliefs and land-use practices—entire native cultures. Aboriginal peoples across the nation are now embracing the goal of restoring and enhancing their grasslands and with them traditional food uses and spiritual practices. Being and working on the land means teaching their youngsters the old ways, the words, the languages. This work bonds young and old who have been encouraged by fate and injustice to become alienated from all that constitutes their being. From Minnesota's rice lands to the Great Plains and Great Basin, even to the sagebrush steppe and coastal marshlands of the Northwest, Native Americans are asserting their cultures and their unity with the earth and the plants that have been part of these cultures for untold centuries. Young people learn to know the plants and to collect seed for restoration on the reservations. They can sell extra of this precious seed for projects elsewhere. Many are training for careers in conservation, but all are learning what it means to be part of the land. For some, restoring prairies means restoring the whole picture. They dream that bison, pronghorn, deer, bighorn sheep, and even horses might once again roam through lush unfenced prairies.

Events of Interest in the Community

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

Wednesdays, 19 and 26 January, 2 and 9 February, 9 to 11:30 a.m. Watershed Wednesdays. Join the fun at Green Island and help protect and care for this special area. Projects vary throughout the season but are always suitable for youth ages 13 and older. Youth under 16 should be accompanied by an adult. For a map go to https://mckenzieriver.org/event/watershed-wednesdays-at-green-island-2/2021-10-13/

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

Tuesday, 25 January, 7 p.m. Fighting Crime with Feathers: The Casebook of a Forensic Ornithologist. Zoom only. Pepper Trail is the senior forensic scientist in ornithology at the U.S. Fish and Wildlife Service, National Fish and Wildlife Forensics Laboratory in Ashland, Oregon. "I have a strange job—I identify the victims of wildlife crime when the victim is a bird," he says. "I'm one of only two people in the world who do this." His presentation will shed some light on how he goes about unraveling feathery mysteries. Check the LCAS website and/or Facebook page for the Zoom link.

Mt. Pisgah Arboretum https://mountpisgaharboretum.com/festivals-events or 541-747-3817

Saturday, 15 January, 9 a.m. to noon. Wildflower Garden Work Party. Join us as we plant, weed, and mulch in the Patricia Baker Wildflower Garden. Meet at the Arboretum Education Building. Tools, gloves, and a parking pass will be provided to volunteers (we suggest you bring along a water bottle). Please RSVP if you plan to attend. Limited to 15 attendees. Monday, 17 January, 10 a.m. to noon. Tiny Things Family Walk. On this walk we'll hunt for small and amazing things—tiny mushrooms, petite mosses, little critters that live in the soil. At the end of the walk we will create miniature terrariums to take home. Preregistration required. Max group size 15. Free for Members and kids under 4. Nonmembers, \$5. Don't forget your parking pass! Sign up here: https://www.signupgenius.com/go/60B044EACAF2AA6F49-winter1

Saturday, 22 January, 9 a.m. to noon. Hillside Trail Work Party. Join us as we work to regrade the Hillside Trail and give it some much needed maintenance. Meet at the Arboretum Education Building. Tools, gloves, and a parking pass will be provided to volunteers (we suggest you bring along a water bottle). Please RSVP if you plan to attend. Limited to 15 attendees. Friday, 4 February, 10 a.m. to noon. Winter Water Family Walk. Water is rushing through the creeks and along the river this time of year. On this walk we'll follow some of that water on its journey, learning where it all comes from and where it

eventually goes. We'll finish the walk by creating a mini cork boat to take home. Perfect for bathtub or mud puddle floats! Preregistration required. Max group size 15. Free for members and kids under 4. Nonmembers, \$5. Don't forget your parking pass! Sign up here: https://www.signupgenius.com/go/60B044EACAF2AA6F49-winter1

University of Oregon's Museum of Natural and Cultural History https://mnch.uoregon.edu/museum-home Monday, 24 January, 12 p.m. Live Stream of Author's Talk with Robin Wall Kimmerer. Join us at the Museum for a live stream of author Robin Wall Kimmerer's talk "Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants." Space is limited. Admission is free. Go to https://mnch.uoregon.edu/events or call 541-346-3024 for information about this and other events.

Native Plant Society of Oregon, Emerald Chapter https://emerald.npsoregon.org/

Monday, 17 January, 7 to 9 p.m. Hidden Prairie: Photographing Life in One Square Meter. In 2018, Chris Helzer, director of science for the Nature Conservancy in Nebraska, embarked upon a journey to photograph all the beauty and diversity he could find within a single square meter of prairie in Aurora, Nebraska. He came away with thousands of photographs, including more than 100 species, but the numbers represented only a small part of the results. By sitting quietly and intently watching a small space, Chris was able to see the prairie in a much more intimate way than he was used to. He had a window into the lives of the tiny organisms that make up prairie communities and got to follow both their stories and the story of the prairie itself through the seasons. The project has resonated with others enough that it has been turned into a book and is the topic of an upcoming museum exhibit and potential documentary. A zoom link will be sent to members and posted on the NPSO Emerald Chapter website closer to the date of the program.

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

Learn something new about the winter forest with each gnome you discover on this family-friendly wander through the woods. Meet outside the Nearby Nature Yurt in Alton Baker Park. Nearby Nature members free, nonmembers \$7/family. Register online. Space is limited. Please plan to wear masks and physically distance from people not in your friend/family group. Saturday, 22 January, 1 to 3 p.m. Citizen Science Saturday: Feeder Watch. Join us for a Citizen Science adventure! This month we will learn about backyard birds as we document bird feeder activity in the Learnscape. Designed for adult participants. If you have a smartphone or camera, bring it to take pictures. Smartphone users please load the iNaturalist.org app onto your phone. Members/volunteers free, nonmembers \$7. Register online. Space limited. Meet outside Nearby Nature's Yurt in Alton Baker Park.

Winter 2022 No School Day Adventures. For info call 541 687-9699 or go to https://www.nearbynature.org/events/

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 refer to <u>Lane County</u> for instructions about the park and updates.

NABA (North American Butterfly Association), Eugene-Springfield Chapter Nothing this month.

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*. Our Web address: http://eugenenaturalhistorysociety.org/

MEMBERSHIP FORM Name Address ____State & Zip____ E-mail (if you want to receive announcements) I (we) prefer electronic copies of NT rather than paper copies. If yes, email address (if different from the one above): **ANNUAL DUES:** Family \$25.00 Individual 15.00 **Annual dues for renewing members** Life Membership 300.00 are payable in September. Contribution **Memberships run from September** to September. Generosity is Make checks payable to: encouraged and appreciated.

Make checks payable to: Eugene Natural History Society P.O. Box 5494, Eugene, OR 97405



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2021-2022 Speakers and Topics

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18 Feb.	Michael Nelson	Fire Ecology and Report Following the 2020 Fires
18 Mar.	Pat O'Grady	Archaeology
15 Apr.	Lauren Ponisio	Bees and Wildfire
20 May	Lauren Hallett	Siskiyou Plant Communities (cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)