

Nature Trails

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The Eugene Natural History Society is based out of the traditional homelands of the Kalapuya peoples who stewarded this land for millennia. Today the Kalapuya people are largely citizens of the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz Indians and continue to play an active role in local communities and in the stewardship of this land.



Winter Raptor Survey Project of the Pacific Northwest

Jeff Fleischer

East Cascades Audubon Society, Bend, OR

Friday, 9 December 2022, 7:30 pm

Cosponsored with the Lane County Audubon Society

The Eugene Natural History Society invites you to our December hybrid meeting. **The in-person meeting will begin at 7:30 in 100 Willamette Hall, University of Oregon**, and the Zoom session will open at 7 pm Pacific Time, which will allow time for everyone to connect and join in friendly conversation. You can find our Zoom link at our website <https://eugenenaturalhistorysociety.org/>, or click on this link: <https://zoom.us/j/97499095971?pwd=eE9sdG9hSHMvOHhIUEJuU21wT20rdz09>



There's another one! Kris and I are keen on looking for raptors as we travel the highways in the south Willamette Valley. Most of the time it's a red-tailed hawk on the crossbeam of a utility pole. But often we see a little kestrel sitting on a wire, and once in a while we spot a bald eagle. Seeing more of them is one of the reliable signs that cooler, wetter weather is on the way.

Jeff Fleischer has seen a lot more of these majestic birds than we have. Fleischer grew up in eastern Pennsylvania, not far from Philadelphia. He had an early interest in biology, which grew into a lifelong passion. His initial foray into academia took him to Florida, where he spent his first year of college at Miami University. This was a fine place to study marine biology, which he started to do. But soon he admitted to himself that he would rather study terrestrial wildlife, so he decided to transfer. He was accepted by several schools, and his choice took him all the way across the country to Corvallis, Oregon, in 1969, where he majored in wildlife science.

During three of his summers at OSU, Fleischer took advantage of the Student Trainee Program and worked at three wildlife refuges. A huge perk went along with this program: he was guaranteed a job when he graduated! That first job was as a biologist in the U.S. Fish and Wildlife Service at the Malheur National Wildlife Refuge in southeastern Oregon, a place very well known to many ENHS and LCAS members. He was the Assistant Refuge Manager there for a little over a year doing many biological surveys, handling public relations, working in law enforcement—sort of a jack of all trades. In 1974 he took another USFWS position, this one in Texas, where he also served as Assistant Refuge Manager. After Texas, Fleischer moved to the Klamath Basin

National Wildlife Refuge Complex, again as Assistant Refuge Manager, the position he held until he retired in 1984. His duties encompassed all six of the refuges in the complex, but primarily he worked on the Upper Klamath and Klamath Forest Refuges. He said he was heavy into law enforcement and public relations, leading many group tours. His biological duties mainly involved waterfowl management.

One of the lasting effects of Fleischer's time with the USFWS was his fascination with birds, especially raptors. After he retired and moved to the Willamette Valley, he decided to do more than just observe them. He began collecting data on the prevalence of raptors in the winter along defined sections of highway, reasoning that making these observations repeatedly and keeping good records would begin to show the dynamics of their populations. He started with just a few routes, and he put his observations on the internet. There was immediate interest in what he was doing. Others wanted to get involved, so he set up routes for them.

Talk about a snowball effect. What is now the Winter Raptor Survey Project has grown from Fleischer himself to over 400 volunteers in Oregon, Washington, California, Idaho, Utah, and Montana. From 79 routes the first year, the project has broadened to 520 today, covering over 30,000 miles of transects. The distance the volunteers have covered over the 18 years is equivalent to about four round trips to the moon. Fleischer sets up all the routes, and the volunteers send him the data they collect. He collates the information and puts it into a massive database. Think about this chore, which he related to me in an offhand way: 400 eager and excited volunteers burying him with data several times a month during our long winters. He deals with each sighting from each volunteer. The man has to be not only dedicated and extremely well organized, but tireless.

For the past 5 years, Jeff has been transferring the Project's data to the Peregrine Fund, including all the data from the previous 13 years. The Peregrine Fund has a huge database that includes all raptors worldwide. In the past year, Fund researchers have analyzed of the data from the Winter Raptor Survey Project, and a journal article based on this information has been submitted and is under review.

Five species account for over 90% of the sightings the volunteers have recorded. In descending order by number of sightings, they are red-tailed hawk, American kestrel, northern harrier, bald eagle, and rough-legged hawk. These five are holding their own in terms of populations. Thirty-one species have been seen throughout the life of the project, and some

of the rarer species are apparently having a rougher time of it than are the big five. The number of sightings of white-tailed kites, for example, has decreased substantially over the life of the project.

The information Fleischer's team has gathered will aid in determining whether fluctuations in populations and movements of individual raptor species are abnormal and will increase awareness of raptors in the study area (which encompasses a significant fraction of the entire western half of the country). Such awareness engenders ownership, which in turn leads to alterations in human behavior and inspires more voices in support of these magnificent birds. What Fleischer has created is a fine example of the value of citizen science to natural history in general and birding in particular.

Here is Fleischer's summary of what we will hear from him.

The East Cascades Audubon Society now sponsors the Winter Raptor Survey Project, which covers all

of Oregon, Washington, and Idaho and parts of California, Utah, and Montana. I will highlight the importance of the Pacific Northwest to wintering birds of prey and the importance of citizen science support, which this project has enjoyed the past 18 winters. I'll talk about the project's origin, how it has expanded over the years, and its goals. I'll describe how survey routes have been created, filled with volunteers, and surveyed and show wonderful photos of birds-of-prey species that have been recorded on project surveys. Finally, I'll give examples of information collected so far.

Please join us and the Lane County Audubon Society for this joint presentation at 7:30 p.m. on Friday, 9 December in 100 Willamette Hall on the University of Oregon campus. This is an in-person talk, although it also will be live-streamed on Zoom. And yes, for those attending in person, there will be cookies!

—John Carter

An Ice-Age Lake McKenzie?

by Whitey Lueck

The McKenzie River in Lane County occupies an uncharacteristically broad flood terrace for a river its size—especially between Finn Rock (just west of Blue River) and the junction of highways 126 and 242 a few miles east of McKenzie Bridge. Geologists attribute this “under-fit” or “misfit” valley (i.e., the current river is far too small to have created such a broad flood plain) to Pleistocene glaciation. A glacier clearly descended the valley now occupied by highway 242 and Lost Creek from the ice sheet that covered the High Cascades plateau to the east and made its way westward at least as far as Finn Rock. A large lateral moraine can be seen just northwest of the Tokatee Golf Course near Rainbow.

But was the valley glacier responsible for the extraordinarily broad valley bottom, or is this topography the result of some other geological event?

Some three decades ago, when ascending on foot the small hill south of Leaburg Dam, which is just before milepost 24 of the McKenzie Highway, I came upon a curious sight. There, wedged in an east-facing crack in the hillside bedrock, were river-rounded cobbles (some over 4 inches in diameter) well over 100 feet above the current valley floor. I thought, “That must have been quite a flood to have deposited rocks of this size so far above the current river!” I was reminded of a similar discovery I'd made previously near Crown Point above the Columbia River east of Portland. Those cobbles wedged in that crack in the bedrock were more than

600 feet above the current Columbia River and are known to have been deposited during one of the multiple and catastrophic Missoula Floods that occurred during the last ice age after an ice dam in northern Idaho broke, releasing many cubic miles of water from Lake Missoula. Those waters roared across eastern Washington and down the Columbia River Gorge, reaching depths of more than 700 feet (!) in some places.

But that was the huge Columbia River, and there I was, high above the relatively small McKenzie River. Hmm.

Also in the 1980s, while hiking along the McKenzie River National Recreation Trail just downriver from the confluence with Lost Creek, I came across a curious sight at the side of the trail where a seep on a steep slope had exposed the bedrock below. Instead of being a single color of hard rock, the “bedrock” consisted of dozens of horizontal lines of alternating dark and light layers that I could easily scratch with a fingernail. I'd learned somewhere that these layers were called varves and indicated successive years of sediment deposits on a lake bottom, with coarser sediments falling to the bottom during, say, spring runoff, and finer sediments being deposited later in the season. Hence, the two different colors, not unlike annual rings in a tree caused by larger, more open vessels forming in spring and smaller, denser vessels formed in summer.

In 2021, when hiking that same section of trail, I found that it had recently been rerouted upslope. I elected to follow the old trail, just to see what had happened that had required entirely rerouting the

trail. I soon arrived at the site of a significant landslide caused by two large Douglas-fir trees and their root wads, which had slid downslope across the trail, revealing the bedrock. I found a large area of exposed varves—scores of them—as well as rocks of various sizes embedded in the soft “bedrock.” Aha!

Another site worth noting is just west of Blue River along the old McKenzie Highway. Between the old Blue River Bridge and McKenzie School, there are several places on the north side of the road where the highway cut has exposed the underlying soil. Across from the former Blue River Ranger Station buildings (destroyed in the 2020 Holiday Farm Fire) is an especially good exposure of well-sorted river cobbles. This exposed area is not a glacial moraine; rather, it’s an alluvial deposit at a great distance from the current McKenzie River and considerably higher. It would have taken quite a flood to deposit cobbles that far from the current valley floor.

On the valley floor east of McKenzie Bridge, the soil is underlain with unsorted river cobbles, sand, and gravel. Many of the larger boulders are 1 foot to several feet in diameter and roughly spherical, i.e., they are not smooth boulders created by centuries or millennia of erosion by water. These boulders were created over a very short period of time and distance by floodwaters of “biblical” proportions.

Based on these four observations—1) the cobbles high above Leaburg Dam; 2) the varves near Lost Creek; 3) the river-sorted cobbles west of Blue River; and 4) the huge, rough, spherical boulders on the valley floor near McKenzie Bridge—I hypothesize that the Lost Creek and McKenzie Valley glacier blocked the upper McKenzie River for years at a time, allowing a lake to form north of the highway 126/242 junction. At least once, but possibly more than once, the lake broke through the ice dam and

released an enormous volume of water downriver toward the Willamette Valley. The varves indicate the many successive seasons of water storage behind the ice dam. The huge spherical boulders near McKenzie Bridge indicate the phenomenal volume and speed of the floodwaters just below the ice dam. The river-sorted (and much smaller) cobbles found farther west, at least as far as Leaburg Dam, indicate the catastrophic scale of this flood (or floods).

Farther down the valley near Vida, no other explanation is plausible for the extraordinarily broad river terraces, some far above the current valley floor and now the site of extensive hazelnut orchards.

Some may assert that these features were created simply by the melting glacier as it receded, perhaps very quickly, toward the end of the most recent ice age about 10,000 years ago. But glacial meltwaters do not create the kinds of features described here nor do they account for the very distinct varves near Lost Creek. The only way these features could have been formed is through cataclysmic floods, which simply do not occur during the melting back of glaciers or even during record-breaking floods of a river the size of the McKenzie.

Much has been written in the past century about the ice-age Missoula Floods, which at least once caused water to back up into the Willamette Valley almost to present-day Eugene. Geologist J Harlen Bretz, who first came up with the cataclysmic/catastrophic flood theory, was laughed at in the 1930s by his colleagues. I, too, anticipate some laughing. After all, I’m not even a geologist. But when the laughing dies down, let’s talk. If someone has a different and better explanation for the various phenomena I describe here, I’m happy to listen. And I promise that I won’t laugh.

The “Handicapped Frog” Hypothesis by Stanley K. Sessions

My story begins in the late 1980s when I was working as a postdoctoral research fellow at University of California–Irvine with Susan Bryant, world expert on amphibian limb development and regeneration. I was contacted there by Steve Ruth, a fellow Berkeley graduate, who was doing some biological survey work near Santa Cruz, California where he found a pond with hundreds of newly metamorphosed Pacific chorus frogs (*Pseudacris regilla*) floating helplessly in the water with badly deformed hind limbs, some with extra legs! Steve sent me a

large sample of deformed amphibians from the pond, mostly frogs but also a few salamander larvae.

He had already tested the pond for water quality, but besides being eutrophic the pond was squeaky clean and teeming with living organisms. The frogs themselves seemed to be perfectly normal little froglets, at least from the waist up. The problem was they had too many hind legs, up to 12 in one case! The supernumerary hind legs were often so deformed that it was almost impossible for the little froglets to walk or even hold themselves upright,

much less eat, and they began dying soon after they arrived.

I cleared and stained the dead frogs with various dyes and macerating agents: Alcian Blue stains cartilage blue, Alizarin Red S stains bony elements dark red, trypsin partially digests the soft tissues, and potassium chloride plus glycerin render all the remaining soft tissues almost as transparent as glass. The result was a collection of jewel-like multilegged frogs with beautifully stained red and blue skeletons. I figured I could at least make T-shirts and coffee mugs to supplement my postdoc salary!



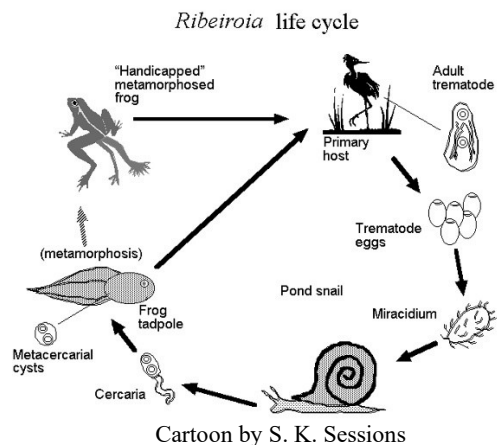
Cleared and stained Pacific chorus frogs with deformed hind limbs. S. K. Sessions

But when I took a closer look at the cleared and stained frogs under a microscope, I found two important clues. The first clue was the presence of numerous cysts of a kind of a parasitic flatworm called a digenetic trematode (*Ribeiroia ondatrae*) clustered around the base of the deformed and extra limbs. The second clue was the fact that many of the duplicated hind limbs formed left-right or right-left mirror image duplications. A huge part of the story now began to fall into place, making me grateful for taking Bayard McConnaughey's invertebrate zoology course when I was an undergraduate at the University of Oregon.

Digenetic trematodes (flukes) are one of the most common parasites of vertebrate animals (including humans), and their complex life cycles are a tribute to the power of evolution via natural selection. The adult *R. ondatrae* lives in the digestive tract of the primary host, in this case predatory aquatic birds (e.g., herons), and its eggs are released onto ponds when the birds defecate. The eggs hatch, releasing a swimming infectious stage (miracidium) that attacks

ramshorn (planorbid) snails, which are the first intermediate host. Once inside a snail, each miracidium transforms into a sporocyst, a mothership of embryos that gives birth to numerous rediae, each of which in turn contains dozens of embryos of the next stage (usually more rediae). Eventually, rediae are produced that contain dozens of embryos of the final infectious stage called cercariae. This embryonic amplification can generate hundreds or even thousands of infectious cercariae from a single trematode egg!

Once fully developed, the cercariae explode out of the snail (often killing the snail in the process). But now the trematode has a problem: How does it get back into its primary host (the heron)? The trematode solves this problem the way that most trematodes do: by infecting organisms that the primary hosts use for food, in this case tadpoles and frogs. In other words, the frogs serve as a second intermediate host in the trematode's life cycle. In the logic of evolution via natural selection, anything that the trematode can do to facilitate successful predation of the tadpoles will be favored by selection.



A cercaria is a miniature flatworm with a muscular tail that allows it to swim around. If a hapless tadpole chances into a swarm of cercariae they will attack the tadpole, attach to the skin, and drop their tails, and each cercaria will form a protective metacercarial cyst that then penetrates the tissues of the tadpole. The mirror-image duplications suggest that these cysts disrupt the spatial arrangement of cells in the early limb bud causing the outgrowth of supernumerary hind limbs. We tested this idea in three ways: surgically implanting microscopic beads, meant to mimic cysts, into the developing

limb buds of tadpoles; surgically rotating tadpole limb buds to cause massive disruption of the spatial arrangements of the cells; and watching the whole process by exposing live tadpoles to living cercariae and then examining the infected tissues. We were able to record the cercariae of *R. ondatrae* targeting the developing tadpole's hind limb buds in the cloacal area where they cause massive injury, and we monitored the subsequent development of duplicated and deformed hind limbs. We concluded that the trematodes had evolved the ability to create "handicapped" frogs that were easy for the

herons to catch and eat, enhancing the probability of successful completion of the trematode's life cycle.

After over 30 years of research and controversy, most researchers now agree that naturally occurring parasites are the primary cause of deformed or extra limbs in frogs. Most also agree that pollution is involved, not toxic chemical pollution but organic pollution that causes ponds to become eutrophic, leading to excess growth of aquatic vegetation and population explosions of pond snails.

Events of Interest in the Community

- **McKenzie River Trust** <https://mckenzieriver.org/events/#event-listings> or 541-345-2799
Every Wednesday, 7 Dec. to June; 9–11:30 am. Watershed Wednesdays at Green Island. Join McKenzie River Trust every Wednesday morning at Green Island to help care for this special area where the McKenzie and Willamette Rivers meet! Projects differ based on the season but typically include invasive species removal, habitat care, planting, and tree establishment. Work is easy to moderately difficult. Projects are best for participants 13 years of age and older. Fall: invasive species removal, plant propagation. Winter: invasive species removal, planting. [Sign Up](#)
Second Saturday, 10 Dec., 8 am–4 pm. Living River Exploration Day at Green Island. Take a walk near the confluence of the Willamette and the McKenzie Rivers. Observe 15 years of tree-planting work on Green Island, a habitat for beaver, river otter, and over 150 species of birds.
- **Museum of Natural and Cultural History, University of Oregon** <https://mnch.uoregon.edu/museum-home>
Thursday, 8 Dec., 5:30–7:30 pm. Oregon Authors. Featuring local writers, including Marli Miller and Bill Sullivan.
Thursday, 15 Dec., 5:30–7:30 pm. Art of Science. Featuring displays from Erika Beyer, Ian Peterson, and Malie Urbanic.
Holiday Nights at the Museum. Visit the Museum this holiday season and enjoy hot cider, refreshments, and discounts. Admission to the store is always free, and admission to the museum is free with a donation of canned food. Go to <https://mnch.uoregon.edu/programs> or call 541-346-3024 to learn about the Museum's many exhibits and programs.
- **Cascade Mycological Society** <https://cascademyco.org/>
Sunday, 11 Dec., 1–3 pm. Mountain Rose Sunday Series: Mushroom Dye Talk and Demo. Mountain Rose Herbs Annex, next to the Mountain Rose Herbs Mercantile, Eugene. Free, but registration required, class limit of 24.
- **Nearby Nature** <https://www.nearbynature.org/> or 541-687-9699
Tuesday, 13 Dec., 10–11:30 am. Green Start Play Day: Furry Friends. The Learnscape, Nearby Nature. Rain or shine, kids 5 and under with an adult. Enjoy outdoor nature play plus toddler and preschool activities and stories all about furry animals. Members free, \$7/family nonmembers. Preregister online.
Monday, 19 Dec., 8:30 am–4:30 pm. No School Day Adventure: Tracks and Trails. Alton Baker Park, Eugene. Rain or shine, kids 5–11 in groups of 12. Sneak through the tall trees and stalk through the grasses in search of mammal tracks and traces. Unlock the mysteries of local critters as we investigate real pelts, skulls, and antlers. Learn new ways to identify animals and tell stories about them using the clues they leave behind. Make your own set of antlers and create a track tale to tell your friends! \$60 members, \$70 nonmembers. Scholarships available. Preregister online. [Find out more »](#)
Tuesday, 20 Dec., 8:30 am–4:30 pm. No School Day Adventure: Winter Wild. Alton Baker Park, Eugene. Rain or shine, kids 5–11 in groups of 12. Construct shelters, warm up around a cozy fire, hide in plain sight, and navigate your way around the park using maps and compasses. \$60 members, \$70 nonmembers. Scholarships available. Preregister online.
Wednesday, 21 Dec., 8:30 am–4:30 pm. No School Day Adventure: Winter Wild. Alton Baker Park, Eugene. Rain or shine, kids 5–11 in groups of 12. Journey to the days before wagon trains as we hike to the Kalapuya Talking Stones and build forest-inspired shelters. Learn words, play games, and hear stories from the Kalapuya culture. Make a campfire in our fire pit (weather permitting) and roast snacks to enjoy with tea from freshly harvested herbs! \$60 members, \$70 nonmembers. Scholarships available. Preregister online.
Monday, 16 Jan., 8:30 am–4:30 pm. No School Day Adventure: Treasure Trackers. Alton Baker Park, Eugene. Rain or shine, kids 5–11 in groups of 12. Hike new trails, discover hidden habitats, and find trees of mystery using maps, clues, and wayfinding skills. Put together puzzles, hide prizes for new friends, and discover find your way to tricky treasures on this day long adventure in nature! \$60 members, \$70 nonmembers. Scholarships available. Preregister online.

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

Saturday, 19 Dec. Third Saturday Bird Walk with Donna Albino. We will meet at 8:30 am at WALTERVILLE Pond, Canal Birding Trail. Turn left just after you cross the WALTERVILLE Canal bridge along Highway 126 (east of Springfield). Reservations are no longer required. Email for more information: audubon@laneaudubon.org.

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

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

Monday, 19 Dec, 7–9 pm. Holiday Social—Botanical Destinations and Stories. Amazon Community Center. Attendees are invited to bring 3–6 photos on a flash drive and recount their botanical adventures over the year. Bring a snack or beverage to share. To make this a no-waste event, please bring your own beverage cup, small plate, utensil, and napkin if possible. See the website for more information.

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

January 2023. Lichen Inventory Project. Mount Pisgah Arboretum is recruiting volunteers to join a community science project that will provide a better understanding of local lichen species. Volunteers will be trained in basic lichen identification and data collection, and all observations for the project will be made through iNaturalist. Volunteers will be expected to attend two trainings and contribute at least 10 hours of active observations. For more information, visit <https://bit.ly/3EbGBoZ>

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

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

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

See the website for programs and information.

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

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

MEMBERSHIP FORM

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I (we) prefer electronic copies of *NT* rather than paper copies. ___ Yes ___ No

E-mail for electronic copies of *NT* _____

ANNUAL DUES: Family	\$25.00
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Life Membership	300.00
Contribution	_____

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

Make checks payable to ENHS

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The Eugene Natural History Society meets on the third Friday, September through May, except in December when the meeting is on the second Friday. Meetings are at 7:30 pm in 100 Willamette Hall, University of Oregon. Any changes will be noted in *Nature Trails* and on our website:
<https://blogs.uoregon.edu/enhsuoregon/>

Parking is available at the UO Physical Plant lot: turn north from Franklin onto Onyx, go about a block to the lot. After 6pm it's open to the public.

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2022–2023 Speakers and Topics

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