

Nature Trails

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Snowy Owls

Cosponsored with Lane County Audubon Society



A female Snowy Owl at her nest fluffs out her feathers before settling in to warm her young. Photo by P. Bannick

Paul Bannick

**Award Winning Author and Photographer
Seattle, Washington**

Friday, 10 December 2021, 7:30 p.m.

The Eugene Natural History Society invites you to their December 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: 10 December 2021 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 fall, 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

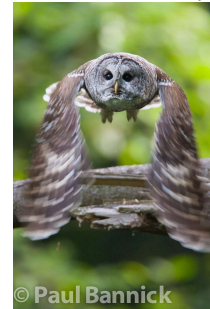
We last had Paul Bannick as our speaker in December, 2015. ENHS and the Lane County Audubon Society have come together again to get him back, this time in a virtual meeting necessitated by the ongoing Covid pandemic. While we regret not being able to have him here in person, nevertheless we are excited that he can interact with us via Zoom. In what follows, I will steal from the introduction I wrote for him six years ago.

Bannick was number eleven in a family of thirteen children in Bellevue, Washington, a suburb of Seattle. As a child he was drawn to the solitude of the outdoors. In an interview in *The Seattle Times* he said, “My earliest memories as a kid have to do with critters—every memory of myself as a kid is of finding a new animal.” He watched Bellevue change from a small town to a suburban city—and the change was done poorly. Animals he once saw often grew scarce under the pressure of urbanization. His concern led to a growing sense of empathy, for the animals as well as the loss of their habitat. In grade school he made little books about wildlife he saw and illustrated them with drawings. He borrowed his sister’s camera, and soon realized his photos made better illustrations than his drawings. His empathy grew into a passion for conservation that still burns bright, and his early experiences with a camera grew into his primary means of communicating this passion.

After he graduated from the University of Washington Bannick became one of the original 75 employees of Aldus Corporation (remember PageMaker and Freehand?). As the software industry matured in western Washington he held management positions at Adobe Systems and Microsoft. He was also volunteering with local conservation organizations. Over a fifteen-year period Bannick moved full-time into the non-profit conservation arena. He has served as the Major-Gifts Director for Conservation Northwest, a Bellingham, Washington organization dedicated to protecting and connecting wild areas from the Pacific Coast to the Canadian Rockies. Conservation work has been emotionally wearing because the forces aligned on the development side are powerful and relentless. In an NPR interview Bannick said, “It is difficult working with conservation every day, because you are always in a position of trying to protect, and feeling the species you are protecting being whittled away.” But on the other hand, he pointed out, the work can be

emotionally rewarding. “We are the stewards of more than just our backyard. When you are actually building resiliency into the system, it’s like you’re creating something eternal—and that has a degree of hope.”

Bannick clearly has mastered the technical and compositional facets of his craft. He is also aware, however, of the importance of patience and the occasional stroke of good luck. Once he was trying for a photo of a barred owl in Seattle’s Discovery Park. “I have my flash and my big lens and my tripod



and all this gear, and I’ve been tromping through the park since early morning. Nothing! So I’m taking off my gear and getting ready to go, and—*smack!*—it smacks me in the head!” That’s right, the owl had swooped down and thumped him in the head. He quickly set up again and got this shot.

Bannick’s photos appear in bird guides put out by the National Audubon Society, the Smithsonian, Stokes, and The National Wildlife Federation. Besides bird guides his work has been featured in publications such as *Sunset*, *Birds and Blooms*, *The New York Times* and *The Handbook of the Birds of the World*. He has two cover stories in *Pacific Northwest*. In 2011 he won the professional division in the Birds and Their Habitat category in Audubon Magazine’s annual photography contest. His book *The Owl and The Woodpecker*, published in 2008, remains one of the best-selling bird books in North America. He has been on dozens of NPR programs, including *Travels with Rick Steves*, and you may have seen him on NBC *Nightly News*. The University of Washington’s Burke Museum developed a traveling exhibit based on photos and text from *The Owl and The Woodpecker*. The Burke used Bannick’s photos to highlight the diversity among these families and to demonstrate the intricate interconnections they share with their avian neighbors and with their environment. His photographs from the arctic and the boreal forests of Alaska and western Canada as well as the forests of Washington, Oregon, Idaho and Montana form the basis of his second book, *Owl: A Year in the Lives of North American Owls*, which received a Gold Medal in the 2017 Independent Publisher Book Awards “Animals/Pets” category.

Most recently, Bannick provides intimate views and thoughtful insights into the life histories of two of the world's most charismatic birds with his two new owl books, *Snowy Owl: A Visual Natural History* and *Great Gray Owl: A Visual Natural History*. Many of his photos show behaviors that previously had only been described in print or shown in hand-drawn illustrations. His photos are accompanied by his own accounts, drawn from two decades of field experience.

In describing his photographic mission Bannick says, "My objective is to take photos that capture behavior people would otherwise not see, and to create a sense of intimacy. Because we cannot value what we don't love and if we can't have the intimacy, we don't feel the love." He concentrates on owls because they are indicators. The health of a particular owl species indicates the health of the ecosystem in which it resides. On Friday, 10 December, at 7:30 p.m. Paul Bannick will show us, and tell us about, Snowy Owls. Here is a summary of his presentation:

"Join award winning author and photographer Paul Bannick on an intimate visual exploration of the life history of the Snowy Owl, based upon his 2020 book, *Snowy Owl: A Visual Natural History*. Through dozens of never-before-published images of the "Arctic Owl", Paul will help us understand how they survive, breed and live alongside other wildlife on the Arctic tundra and in wintering areas further south. He will also look at how they compare to other North American Owls and what we can do to help them thrive. Paul's startling photographs illustrate behaviors, such as courtship displays, that are heretofore only available as illustrations elsewhere. These images are complemented by decades of first-hand experience with these birds during all seasons of the year and reflect the latest science." Treat yourself and join the Zoom audience for Paul Bannick's talk, Snowy Owls. The link is on the bottom of the cover page of this newsletter. John Carter

Birds: Surviving Cold Weather

Text and photo by Dan Gleason



As winter approaches, animals must deal with increasingly lower temperatures, and birds have a number of methods to survive winter weather, both behavioral and biological.

Migration and Prey Changes. Some animals find shelter and enter an inactive state, like hibernating bears. But many animals, and certainly birds, are active year-round. Mammals may increase fur volume and store fat for insulation. Birds face similar challenges but they don't necessarily fly away. In fact, cold, per se, is not as critical to birds as other factors.

Prey Changes. Prey species' populations diminish with cold weather onset. Flying insects become scarce, so insect-eating birds, like swallows and flycatchers, fly south where insects are available. Some raptors also migrate because of prey limitations: Swainson's Hawks mostly feed on

insects (grasshoppers, dragonflies and some butterfly larvae) during the non-breeding season, but this prey is absent in wintry North America so they migrate to South America, avoiding contending with prolonged cold and lack of prey.

Day length impacts. Even when prey is present, shortened day lengths limit the amount of time that birds have to search for food (except nocturnal birds). Conversely, shortened days mean longer cold through the night, affecting birds and prey species.

Insulation. Many birds do fine when exposed to some cold, in the short term. They have an excellent layer of feather insulation covering their body (like a down jacket). Beneath the feathers covering/shaping the body, is a layer of finely barbed, fluffy down feathers, as well as the downy base of body feathers. This dense, downy plumage traps air, providing effective insulation—so effective that a thermometer placed on skin beneath the down would read nearly 100° F, even if the surrounding air temperature were only 35° F. The bird's internal temperature (102-103° F) is thus maintained. Prolonged or intense cold do require additional adaptations, and some birds in northern climates have more body feathers than southern counterparts, or more feathers in winter than summer.

Other Physiological Adaptations. Downy feathers alone are not enough to allow birds to survive extreme cold. Shivering is one way to create heat, but birds living at higher latitudes have even more physiological adaptations. Some birds slowly acclimatize to winter as fall brings longer, cooler nights. An American Goldfinch fully acclimatized to

winter can survive temperatures as low as -90°F for six to seven hours! But, if not acclimatized, it could only live for about an hour under such conditions. Black-capped Chickadees can lower their body temperature at night as much as 11–18° F as a way to conserve energy.

Additionally, a few bird species save energy by going into torpor, slowing their metabolism and lowering their body temperature significantly. Hummingbirds do this routinely each night, otherwise their high metabolism would cause them to starve overnight. One process used to recover from torpor is shivering, and even birds that don't go into torpor may shiver at times. Shivering produces heat quickly in muscles and this warmth is quickly spread to surrounding parts of the body.

Turkey Vultures, like chickadees, lower their body temperature at night to conserve energy. During cold or food-scarce days, Turkey Vultures will lower their body temperature for short periods, important because their bare head makes them vulnerable to heat loss. Difficulty handling cold may also be one reason most Turkey Vultures migrate south for the winter, but it can't completely explain this migration. Turkey Vultures winter as far north as southern New York in the east where winters can be quite cold. In the southern Willamette Valley, specifically near Fern Ridge Reservoir, there has long been a small winter population of Turkey Vultures and they seem to have survived well during winter.

Heat loss. Feathers provide good insulation from the cold, but on portions of the body that lack feathers, heat can be lost, usually in the beak and the feet. You will often see ducks, shorebirds or other birds resting with their heads turned back and the beak tucked under the back feathers, reducing heat loss. At the same time, they may stand on one foot and pull the other foot up into the feathers of the lower body, leaving only one leg and foot showing, so only a small amount of heat is lost from one foot. Some birds...think Snowy Owls... have feathers on the foot to provide insulation, but foot feathers in birds are generally lacking.

Birds' leg muscle mass is high on the leg, so the leg muscles are not directly exposed to the cold. The leg muscles, well-contained within the feathers of the body, keep the legs warm and flexible. The leg muscle location also helps keep birds' body mass well-centered, allowing efficient flight and balance. Tendons run from the leg muscles along the length of the leg and foot and beneath each toe. Contraction of these muscles stretches the tendons to move the leg and foot bones. Since the leg muscles are high and warm, feet are less affected by cold, an important consideration for birds that perch and especially

important for raptors, which use their feet to catch and carry prey. Cold feet would be deadly as it could render a raptor unable to catch prey.

Since most birds have very little foot insulation, cold blood returning from the feet to the body could chill the blood. To minimize this, birds have an adaptation called "countercurrent heat exchange flow." Blood vessels (veins) returning blood from the foot to the body are in close proximity to blood vessels bringing blood from the body to the foot (arteries). Thus, blood leaving the foot is gradually warmed along the length of the leg and foot by blood leaving the warm body. Periodically, an increased flow of blood is sent to the feet to rewarm them, a system most elaborately developed in birds like gulls, and species that spend a lot of time with their feet in cold water.

Snow and ice impacts. Frozen ground also makes it difficult for some birds to find food, especially mud-probing shorebirds seeking invertebrates. Snow-covered ground presents a similar challenge, but snow may provide some benefit to raptors, as small, ground-foraging birds, like juncos, are more visible on snow and can be easier targets for bird-eating raptors like accipiters and falcons. And, although some small rodents may hibernate, many voles and mice remain active year-round, and are more visible on the snow. As snow gets deeper, mice will actively burrow beneath it, becoming invisible to many predators. But Great Gray Owls don't need to *see* the mice to be aware of them: the incredible hearing of these owls allows them to hear mice beneath the snow. They can accurately locate and plunge through as much as 17 inches of snow to capture actively-moving mice!

Prey availability. Change in availability of prey during cold weather causes some birds to shift their diet to different prey species in winter. One example is, in summer, Northern Harriers eat many rodents, medium-sized mammals, small birds and some frogs and reptiles. Many of these animals are still available to harriers during the winter in the southern portions of the United States, but in more northern latitudes, harriers shift their diet to become mostly dependent on voles, which remain active in winter.

Metabolic and behavioral changes. Energy conservation is important in cold weather, and birds can also undergo metabolic changes as they acclimatize to changing temperatures. Behavioral changes may also be important. Any *decrease* in activity can conserve energy for heat production. Many raptors, especially Buteos, sit and watch for activity rather than actively seeking prey. It might seem like increased food would be important to produce body heat, but many raptors actually hunt

less in winter. In spring and summer, birds have young to feed, requiring frequent searches for food. In winter, the bird only hunts for itself so the food demand is less, and less energy needs to be expended. Periods of inactivity conserve energy for use in maintaining body heat more efficiently.

Cold weather does impact birds, and many impacts require adaptation or behavioral change. Most birds survive cold, but food availability may require change as temperatures cool and day length shortens. Some physiological changes are not very obvious, but careful observation may help you be aware of subtle changes allowing birds to more easily survive winter.

To Be, Or Not To Be, A Species. Aye, There's the Rub!

By Reida Kimmel

I've been reading about the nearly extinct red wolf of our southeastern states for years. Some call it a precious, critically endangered species, others claim that the remaining individuals are so contaminated

with coyote genes that they are not worthy of protection. Is the red wolf a very special species worthy of the efforts being made to continue its existence? Is it even a species? An article in the November 2021 issue of *Natural*



Endangered red wolf standing on a shed in a zoo.

History Magazine, "Renewed Hope for the Red Wolf," by Jim Knox, with its intriguing mention of "ghost alleles," sent Chuck and me on a Web search for recent research about red wolves. What we found was amazing. How little we had known about any wolves except *Canis lupus*, Yellowstone's grey wolf! The fascinating, complex story involves both history and paleontology. Before European settlement, the red wolf *Canis rufus* inhabited the eastern seaboard and southeast, and the also endangered eastern wolf *Canis lycaon*, now known as the Algonquin wolf, ranged northeast, far into the future Canada. Genetic studies in 2006 proved that *C. lycaon* was a distinct species. Later research, published in 2018, proposed that *C. rufus* was a true species also. Both the wolf species of eastern North America evolved with *Canis latrans*, the coyote, on the North American continent well before *Canis lupus* migrated from Eurasia, where it had evolved, into western North America. It's now possible to trace the history of wolf and coyote genes back to about 500 thousand years ago. Red wolves and Algonquin wolves are genetically close but very separate from grey wolves. Being

genetically closer to coyotes, both species can and do hybridize with coyotes, which *C. lupus* rarely does. Red and Algonquin wolves share many traits. They are smaller and slenderer than grey wolves and camouflage colored. They live in small family packs characterized by fluid dynamics, wherein members may shift packs frequently, but the pack size remains small—three to six individuals. The two species are well suited for woodlands.

The red wolf was very familiar to settlers in the Southeast. Audubon painted the species, ruddy coated with black markings on the back and a pale belly. Habitat loss brought wolves and settlers into close contact, and, as always, wolves were loathed and persecuted. By the 1960s the species had disappeared from all but the most hostile and remote lands, the thickets and cane breaks of southeast Texas and southwest Louisiana. Observers were quick to see that the loss of red wolves created a damaging imbalance in the whole ecosystem. Without red wolves, which had killed coyotes whenever possible, coyote populations boomed. Their range expanded. With so few individuals of their own kind remaining, red wolves bred with coyotes. Researchers felt that only by isolating the few remaining "pure" red wolves could the species be saved. For five years in the early 1970s, biologists from the US Fish and Wildlife Service (USFWS) captured all the remaining wild red wolves. Lacking modern genetic tools for identifying species, these biologists picked the wolves they thought looked like true red wolves. Only seventeen of the 240 individuals captured were deemed acceptable, and of these, only twelve ever bred. What a tiny gene pool with which to preserve a species!

The red wolf became a flagship species in our struggles to preserve species diversity in these times of extinction. It was included in the Species Protection Act of 1966. That was seven years before the passing of the Endangered Species Act of 1973! Protecting the red wolf so early, and patiently persisting by trial and error, researchers made the red wolf recovery program the model for raising healthy individuals in spite of tiny gene pools, and for learning how to safely return captive-bred individuals

to the wild. The captive-bred wolves were never treated as pets. They were allowed to live as completely as possible without human contact. They got to roam in what space was feasible and were given opportunities to hunt. The USFWS collaborated with zoos and parks all over America. To avoid loss of fertility and the expression of deleterious recessive genes, the Species Survival Plan demanded careful monitoring of each breeding individual's pedigrees. Wolves were mated either naturally or by artificial insemination to individuals least related to themselves. By 1980 there were enough red wolf pups to try a release on Federal land in the Appalachians. In 1988, red wolves produced a litter at Alligator River National Wildlife Refuge in Coastal North Carolina. Still, even combining the wild and captive breeding populations, total numbers of red wolves only averaged about 250. The politicians and gun-toting wolf haters never ceased their clamoring. Wolves were shot, and trapped. The wild population shrank.

Any hope for the red wolf to survive as a species depends on enlarging the gene pool and finding additional legally protected safe habitat for rewilding. Increasing genetic diversity gives insurance against human-caused and natural disasters. Now research holds out hope that increasing diversity is possible, and our model species for nurturing recovery with captive breeding and intelligent rewilding might become a model species for teasing out genetics and evolutionary secrets impossible for researchers forty years ago to imagine.

In 2008 Ron Wooten lost a pet to coyotes on rough and rugged Galveston Island near Houston.

The coyote population there is isolated from the mainland. Trained in wildlife management, Wooten noticed that the coyotes did not look "right." Intrigued, he photographed them for several years and finally got two environmental scientists to look into the matter. Bridgett vonHoldt and Kristin Brzeski did modern genetic analysis of tissue samples from road kills sent by Wooten, and found wonderful surprises. The "coyotes" were indeed hybrids, but genetically they were more red wolf than coyote. vonHoldt and Brzeski had found unique genes, referred to as "private" or "ghost" alleles, in this case alleles that the red wolf population once had, but that were absent from the captive-bred population. Algonquin wolves have ghost alleles too, and they do not share them with red wolves. If the ghost alleles can be bred into captive-raised stocks, then genetically, the offspring carrying those genes will be more like ancestral red wolves, more diverse, more fit. How does one tease out ghost alleles? The process begins with breeding hybrids from Galveston Island rich in wolf genetic markers to each other within the hybrid population, then selecting offspring with the highest proportions of these ghost alleles to breed, and finally some generations later, breeding hybrid individuals with very high proportions of these wolf alleles into the captive red wolf families, and so on, until the new ancient genes are present and expressed in future generations. It requires an expensive, long-term commitment but the potential rewards make the effort worthwhile. Here's hoping red wolves can lead the way to rescuing other fragile species, starting, I hope, with those Algonquin wolves up there in the boreal forest!

Events of Interest in the Community

McKenzie River Trust <https://mckenzieriver.org/events/#event-listings> (541) 345-2799

Saturday, 11 December, 9 a.m. to 3 p.m. Living River Exploration Day at Green Island.

Take a walk near where the Willamette and McKenzie Rivers meet. Observe fifteen years of tree-planting work on Green Island, a habitat for beaver, river otter, and over 150 species of birds. Because this property is a privately owned space in active conservation, there are a few things to know before you visit: No pets, please. There will be a port-a-potty available but no other facilities. Bring water with you. Bikes are great. The trails are a mix of loose gravel and dirt farm roads, so big tires are better. Please drive under 5 MPH past the houses on Green Island Rd. Gates will be closed at 3 p.m. Please practice COVID-19 safety during your visit. Mask up and maintain a safe physical distance from other visitors outside your group. This event is free and does not require registration.

Wednesdays, 8, 15, 22, 29 December, 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

Friday, 10 December 7 p.m. Snowy Owls, with Paul Bannick. Joint with Eugene Natural History Society. Zoom only. See p.1 of this newsletter for the link.

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

Tuesday, 21 December, 10 a.m. to noon. Winter Solstice Family Walk. Celebrate the start of winter with a walk at the Arboretum! We'll search for signs of life and learn what changes happen here during the winter months. Preregistration and

masks required. Max group size 15. **FREE for Members and kids under 4.** Non-members, \$5. Don't forget your parking pass! Sign up here- <https://www.signupgenius.com/go/60B044EACAF2AA6F49-summer>

University of Oregon's Museum of Natural and Cultural History <https://mnch.uoregon.edu/museum-home>

Thursday, 9 December, 5 to 7 p.m. Holiday Nights at the Museum with Bill Sullivan. Join local guidebook author [Bill Sullivan](#) for a meet-and-greet, book signing, and a talk on Oregon's geology and natural disasters, which will take you into some of the state's most scenic historic sites. Family-friendly geology-themed games will also be available.

Thursday, 16 December, 5 to 7 p.m. Holiday Nights at the Museum with the Cascades Raptor Center. Join us for an evening bird-party! Representatives from the [Cascades Raptor Center](#) and the [Lane County Audubon Society](#) will be at the museum with family-friendly activities and information about your local back-yard birds. Explore the exhibits with a bird-themed scavenger hunt and make crafts to take with you.

Go to <https://mnch.uoregon.edu/events> or call 541-346-3024 for information about these and other events.

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

Monday, 20 December, 6:30 to 7 p.m. for socializing; 7 to 9 p.m. for slide sharing. Annual Holiday Social: Botanical Destinations and Stories. All are welcome. We will socialize in the Zoom Gallery, share our plant photos, and have a few fun botanical contests as well. We have trivia questions with prizes!. If you would like to share and recount your botanical adventures over the year, you are invited to submit 3 to 5 photos. Please label all slides, pictures, and folders with your first and last name. Send photos to Steven Yeager at em_president@npsoregon.org or drop your photos in this [Google Drive folder](#). The Zoom link will be sent to members and posted on the NPSO Emerald Chapter web site closer to the date of the program.

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

Tuesday, 14 December, 10 a.m. to 12:30 p.m. Green Start Play Day: Cozy Creatures. Enjoy self-led outdoor nature exploration in our Learnscape. Investigate tracks, pelts, and skulls of local mammals! Check in with Miss Grace at the start of your family's 45 min reserved time slot to receive instructions, and then set off in our safe and exciting outdoor classroom to discover toddler and pre-school activities, stories, and games. Rain or shine! Kids 5 and under only, with an adult. Please be sure to [pre-register](#) to reserve your time slot; there will only be three families max in the Learnscape at the same time (with social distancing guidelines in place). Members FREE, non-members \$7/family

For information on other NN events, 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 coronavirus/COVID-19 pandemic. Please refer to [Lane County](#) for instructions about the park and updates.

NABA Eugene-Springfield Chapter

Thursday, 9 December. 6:30 p.m. Get-together. 7 p.m. Program: See What It's Like to Stare a Butterfly in the Eyes. with David Lee Meyers. Eugene Garden Club. 1645 High St. If you have any questions, please contact Alison Center at scottnalison@live.com, or Dave or Lois Hagen at hagenlm1@gmail.com.

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 _____

City _____ State & Zip _____ Phone _____

E-mail (if you want to receive announcements) _____

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

If yes, email address (if different from the one above): _____

ANNUAL DUES: Family \$25.00

Individual 15.00

Life Membership 300.00

Contribution _____

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

Make checks payable to:

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P.O. Box 5494, Eugene, OR 97405



The cover of Bannick's 2020 book.

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2021-2022 Speakers and Topics

10 Dec. Paul Bannick

21 Jan. Dana Lepofsky

18 Feb. Michael Nelson

18 Mar. Pat O'Grady

15 Apr. Lauren Ponisio

20 May Lauren Hallett

Snowy Owls (Cosponsored with Lane County Audubon Society)

Clam Beds and Traditional Ecological Management in Island Ecosystems

Fire Ecology and Report Following the 2020 Fires

Archaeology

Bees and Wildfire

Siskiyou Plant Communities (cosponsored with the Emerald Chapter of the Native Plant Society of Oregon)