

# *Nature Trails*

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## **How the Brown Recluse Got Its Bite: Spider Venom Diversity And Evolution**

**Greta Binford, Associate Professor of Biology,  
Lewis and Clark College, Portland, Oregon**

**Friday, 19 February 2016, 7:30pm, Room  
100 Willamette Hall, UO Campus**

[Ed. note: The introduction I wrote for Dr. Binford four years ago is still relevant. I'm re-using most of it here, having been unable to uncover new information.]

One of Professor Greta Binford's talents is finding spiders. Binford has come by her "spidey sense", as a post-doc in her lab describes it, through long hours in rough terrain, often at night, in the rain, at altitude, where it's cold. And also in deserts, where it's hot. She now seems to know just which rocks to turn over, which rotten logs to tear apart, or where in the abandoned garage to find one of these shy creatures.

Binford began developing her powers of observation at a young age. She grew up on a farm not far from Crawfordsville, Indiana, and her job, even as a youngster, was to keep track of the cows. She had to pay attention to anything out of the ordinary – a cow about to drop a calf, a hole in the fence – and to hustle back to the house and report it to her parents. When not on cow duty the young Binford spent a lot of her free time just wandering in the woods nearby.

After graduating from high school in Crawfordsville Binford enrolled at Purdue University, only a few miles north of her home. She first tried pre-vet, following her love of animals. When she found vet school not to her liking she switched to psychology, but after two years at Purdue she took two years off from formal education, moving to Cincinnati and coaching gymnastics – she'd been a gymnast in high school.

This sojourn complete, she enrolled at Miami University of Ohio, majoring in biology, her career goal now having switched to teaching biology in high school. But an even larger switch was about to happen. Binford was offered the opportunity to spend a summer in the Peruvian Amazon, assisting one of her biology professors. She took it! Her job was to observe a colony of social spiders: watch them, see what they do, take good notes. When the summer was over the professor (clever mentor, to have such an ulterior motive) told her she'd been observing a species about which very little was known and that she, Greta Binford, a 24-year-old undergraduate, was now the world's leading expert on this spider. It was one of those life-changing moments. She realized that, with more than 42,000 spider species on this earth, if by spending just a few weeks studying one of them made her a world expert, there must be a huge amount we do not know – about biodiversity

in general and spiders in particular. This was essentially lift-off for her career.

After graduating from Miami University Binford went to the University of Utah for her M.S., in Ecology and Evolutionary Biology, then to the University of Arizona for her Ph.D., also in EEB, studying spiders. She stayed on at UA in a post-doctoral position, during which she learned the biochemistry and molecular biophysics that are integral to her present research program.

In 2003 Binford joined the faculty at Lewis and Clark College, in Portland, Oregon. She has continued research on spider diversity, with spider venom as her central focus. The quality of her program is evidenced by its being regularly supported by the National Science Foundation (not the usual case for a faculty member of a small, liberal-arts college).

Besides being a good researcher, Binford's focus on spider venom, and some of the procedures required to carry out her work, have led to a certain notoriety. She has demonstrated how to milk venom from a BIG spider on National Public Radio's Science Friday (<http://www.sciencefriday.com/videos/watch/10011>). She's been profiled in The New Yorker and the Oregonian. Tom Ashbrook's interview of her on NPR's On Point led to a children's book about her: *Silk and Venom: Search for a Dangerous Spider*. She's been on Oregon Field Guide (<http://www.opb.org/programs/ofg/segments/view/1635>). Binford was named Oregon Professor of the Year in 2011, an award from the Council for Advancement and Support of Education and The Carnegie Foundation for the Advancement of Teaching. She has even achieved a bit of immortality: some of her fellow arachnologists have named a new spider species *Austrarchaea binfordae*.

Binford and her students hunt spiders. They have been to various North American locations, including extensive searches in the desert southwest. They have gone to several countries in Central and South America, to Southern, Western and Northern Africa, China, and Cuba. Besides getting to go on these collection adventures, her students help raise the funds that make the trips possible.

There's a room in the Binford lab in which over 800 different spiders are housed, all alive, all needing something to eat on a regular basis. In 25 years working with them Binford has never been bitten. This large collection is important to the long-term goals of her research program. Lab

members analyze the proteins in spider venom, study the genes involved in producing the myriad components of venom, document the evolutionary and biogeographical histories of the spiders, and observe the effects of their venom on prey. They focus on the brown recluse spider, *Loxosceles reclusa*, and related species in the *Loxosceles* genus, and the related genus *Sicarius*. There are roughly 120 species in the two genera.

Binford is passionate about her work, in a pleasant way. She says “I look like an otherwise normal person, but I’ve got this obsession with

spider diversity.” Her intensity, tenacity, passion and good humor combine to make her an excellent teacher. After all, that Oregon Professor of the Year award means that she was rated as one of the 50 best in the United States! So once again the Eugene Natural History Society will be hosting an uplifting, educational experience, free, open to all, and complete with cookies. Don’t miss Professor Greta Binford’s talk, **How the Brown Recluse Got Its Bite: Spider Venom Diversity and Evolution**, at 7:30 pm Friday, 19 February, in Room 100 Willamette Hall on the U of O campus.

## Steppes: Users, Abusers, and Denizens

by Reida Kimmel

The first Europeans who settled on America’s East Coast entered a moist, forested ecology not unlike the one they left behind. There was plenty of grass – mostly *Spartina patens* – in the East Coast marshes, however, and the settlers used the salt marshes for hay and pasture, as they always had. *Spartina* is still abundant today in spite of incursions by the alien reed *Phragmites australis*. As settlers deforested the land they introduced European timothy, orchard grass, various ryes and vetch as the preferred grasses. Today species native to the East Coast are marginalized and in serious decline. Is it any different in our own Willamette Valley where our native bunch grasses, which thrived beneath the oaks in the Valley savannahs, were replaced by European species, deemed superior forage crops, or by grain fields?

The greatest surprise for settlers in the eighteenth and nineteenth centuries came when they ventured west of the Appalachians and discovered an enormous steppeland over two thousand miles from east to west and stretching from Texas to Northern Saskatchewan and Alberta. It took some years for farmers to conquer the rich soils of the tallgrass prairies because the dense and deep roots of the native grasses defied plowing. Farmers found, but failed to appreciate, a wealth of wonderful plants many times more diverse and species-rich than in the woodlands of the East. Some of the grasses – big bluestem, Indian grass, little bluestem and switch grass – could grow over eight feet high, and there were many other species of grass, mostly bunch grasses, and forbs, with their mix of stunning flowers. Predators and prey could hide in the tall grasses. It was an overwhelming and perhaps spooky new world. But soon tidy farms and grain fields stretched to the horizon and beyond. The wilderness was conquered and native plants became rare. Today only one percent of the native tallgrass prairie remains.

Most people do not think of the tallgrass prairies of Illinois, Iowa and Kansas as steppes, but when you examine the grasslands of the world a pattern emerges. The vast grasslands on four continents have less rainfall than the forested areas. They have a “continental climate” with extremes of hot summers, and cold winters. Storms can be fierce. Tornadoes and monster hailstorms are common. Some steppelands including America’s tallgrass prairie, receive the major part of their moisture in the summer, and others, like the high desert of Oregon and Nevada, are winter wet and summer dry. It is said that the 100<sup>th</sup> meridian is the line between tallgrass and shortgrass prairie in America, but the gradations are more subtle. Shortgrass prairie, which dominates much of the inland western states and provinces, in a wet year may support tall grass species abundantly. In our Southwest and the southern regions of far eastern Europe and Asia, steppes grade into true desert, while more northerly regions of the semi-arid steppes, receiving the same sparse rainfall, will support shrub steppe. These vegetative patterns can be seen in all the world’s steppes: in Patagonia, Eurasia, and South Africa as well as in North America.

Eastern Oregon is dominated by sagebrush steppe, generally too cool and moist to be true desert, but too arid and infertile to support shortgrass or tallgrass prairie. Plants spread out to capture what moisture there is, rather than growing in dense clumps. Grasses and forbs are more abundant than the sagebrush. The soil is protected by cryptogamic crust, a mix of lichens, mosses, fungi and bacteria that captures nitrogen from the air and reduces evaporation and erosion.

Big sagebrush habitat, found in altitudes of 4500 to 7000 feet, also supports juniper, a native but fast-growing species that can outcompete the sagebrush after wildfires. Because of their taller shrubs and trees, including mature junipers, the big sagebrush habitats, if they have a healthy understory of grasses and forbs, have much larger bird populations than

low sagebrush. Declining vertebrate as well as plant species depend for their existence on either or both the tall and low sagebrush communities. Not just the greater sage-grouse, but ferruginous hawks, loggerhead shrikes, sage and Brewer's sparrows, sagebrush lizards, Washington ground squirrels and pygmy rabbits require healthy sagebrush habitat.

But the impact of livestock has been huge. The native bunch grasses and forbs have been grazed too hard, and cheat grass and crested wheat grass, invasives of the worst order, but good cattle forage for a few weeks every year, have replaced native species. The introduced grasses are very prone to frequent large, intensely hot, fires. In the less fertile low sagebrush, the sage takes 150 to 300 years fully to recover.

With the very truly endangered sage-grouse not listed as an endangered species, we must develop creative strategies to improve conditions for these iconic birds, which in turn will help all those other threatened species. But the BLM has a poor record of land preservation, and much of the best range for sage-grouse is privately owned. Landowners can be persuaded to protect habitat if there are rewards. The Sage Grouse Initiative supplies money from the Farm Bill for ranchers to improve their rangeland. Businesses, concerned citizens, and donors like the Intermountain West Joint Venture and the Rocky Mountain Elk Foundation have contributed cash, labor, and a palatable persuasive voice in

encouraging ranchers to join the habitat improvement project.

How can we prove that improving ranch lands can benefit both the birds and the bovines? Some very new research by Montana State entomologist Hayes Goosey points to a plausible fix for vital parts of the sage-grouse's range. In Montana, sage-grouse share almost their entire core habitat with cattle, with the best of this land, in terms of water resources and plant life, being privately owned. Goosey is monitoring the insect populations on twenty-six sites on five different large ranches. The Sage Grouse Initiative pays these ranchers to rest and rotate their pastures, which become lush and rich in insects. Leaving these pastures ungrazed early in the season allows the sage-grouse to forage for the abundant arthropods, rich in the fats and proteins that the hens and chicks need. Well-fed chicks mean higher survival rates per brood. Rested pastures, when the cattle are turned onto them, provide better forage for the cattle as well. If ranchers rotate their use of pastures, the grass can recover, leaving less erodible bare earth. Healthy rangeland is good for cattle and grouse, and for ranchers. This is a much better land-use plan than leaving the ranchers to plow the bottomlands to grow more lucrative crops, with the complete loss of grouse habitat that would entail. That option would indeed be a tragedy and we have seen enough of those.

One positive result of the illegal occupation of the Malheur National Wildlife Refuge is the generous financial support the Refuge has been receiving. The organization Friends of Malheur National Wildlife Refuge has received donations totaling in the tens of thousands of dollars. These funds will be put to good use once the last of the illegal occupiers has left and supporters of the Refuge can go about the business of restoring it.

The Malheur Field Station (MFS) has not been so fortunate. Although located on the Refuge – and thereby often confused with the Refuge headquarters – the MFS is run by a private nonprofit organization and has suffered because of the occupation. Besides having been vandalized, at least one group of visitors has canceled, putting the MFS in a precarious financial position. The ENHS and many other organizations have made the MFS home base during trips to the Refuge and adjacent areas, and we would hate to lose this wonderful facility. Please consider making a donation to the MFS: <http://www.malheurfieldstation.com/support-2/>

### **Soft-spoken Persistence** by Tom A. Titus

The winter news out of Malheur National Wildlife Refuge has been fascinating. Perhaps we should call it a National Wild Ride Refuge. I could use this column to talk about how angry I was, how much sleep I lost obsessing over the whole sordid affair, how I later shunned it. You could read a discourse on the need for public land, a rant about the inherent selfishness of extractionist capitalism, or a story about my family members in Harney County who have seen their community torn apart. But by now all of this is depressingly predictable.

Instead I'm going to write about Gray Jays.

Last weekend I went to prune our apple orchard in the Coast Range. The window of cold weather dormancy for pruning is becoming increasingly narrow in this new normal that we call winter. By February the deadline for bud break, which has little to do with calendars and a lot to do with the intrinsic response of trees to temperature, was already closing quickly. On the front porch of the Johnny Gunter Cabin, sunlight poured between vaporous gray-white clouds levitating above the ridge across the valley. I was sharpening my pruning tools, a rare proactive

move that I hoped would increase the number of pruned stems per hour per aging wrists and shoulders.

My eyes were drawn to movement in the tangled bareness of a snowball bush about 20 meters off the porch. A long feathered tail disappeared around the far side of the bush. I was struck by the gentle but purposeful way in which the bird moved. I stopped sharpening and watched. A Gray Jay appeared. There were three others further out. Two were stopped in the big apple tree on the hill where my garden once was. Another was perched atop a small chestnut tree planted in honor of my best friend's mother. All of the birds were soft and deliberate, small pieces of cloud drifting down the gentle slope of the meadow. Even their voices were ethereal. They have left behind the raucous screeching, chattering, growling, and crowing of their many corvid cousins. The Gray Jays mewed like newborn kittens, occasionally throwing in a subdued chittering laugh.

Gray Jays have never visited me at the cabin, but I wasn't shocked to see them. For years a large flock has been calling on the neighbors a mile up the road. The jays come for the cat kibbles sitting in a dish at the front of the house. Their calm, collective persistence has completely intimidated the cat. Jerry has them trained to his hand; the jays are smart and have learned that he poses no threat. They also really like cat kibbles. This makes sense given that they eat just about anything with any nutrition that they encounter in their tranquil comings and goings, and cat kibbles can't really be beat for calories in small packages. Watching the small flock from the porch, I found myself hoping that this was a different group of birds, a tiny anecdotal sign that their population might be increasing.

Gray Jays first came into my life on extended family camping trips high into the mountains of western Idaho. These jays would glide in from tall spruce and hemlock to canvas our campsite for bits of food. With four young boys eating breakfast, lunch, and dinner outside, the pickings must have been substantial. Dad called them "camp robbers." That sounded right to me. They were in the business of taking things.

I didn't shed that pejorative name until college, when I was learning bird identification from museum

skins. The gray, stuffed, rigid specimen smelling of mothballs, neck outstretched, wings flat against its body, legs pulled straight out behind, was no more deserving of the name "bird" than a human cadaver might be called "person." But I immediately recognized the "camp robber" from that indelible image carried from childhood, those soft-spoken fluffs of cloud dropping in from dark conifers beside a crystalline lake full of rising trout. All that was necessary for a shift in consciousness was a new name. Gray Jay. Bird. Beautiful. Alive.

The pruning went well, but by afternoon my arms were tired. The low-slung sun seemed tired also, resting behind clouds, barely keeping its head above the southwestern ridges. I was reaching with a long-handled lopper into the top of the Grimes Golden apple tree when the Gray Jays came into the orchard. They were curious about my affairs, maybe wondering if I had any cat kibbles. The pruner and I took a break and leaned against the trunk. The lead jay swooped into the lower branches of a chinquapin tree near where I rested. The chinquapin takes up valuable orchard space and should have been cut down years ago. But I like chinquapins. So there it stands, now 5 meters high and covered with lancelet leathery green leaves that are oblivious to winter.

The jay moved in small resolute hops. Beneath her black cap, she scrutinized me with a shiny obsidian eye. I found myself uttering the question out loud. "It's been 20 years – why have you waited?" Since I was alone, my sanity would not be questioned, even though I was, after all, attempting to engage a Gray Jay in conversation without knowing a lick of Gray Jay-ese. There was no reply, only another hop, another inscrutable dark-eyed stare. From a quiet space in my mind, a place that I would have been hard-pressed to find earlier in the week, I answered for her. *I came because there is an intelligent, soft-spoken, slow-moving persistence that works in this world. I came because right now, in this time of chaotic, hard-edged human affairs, you need to know this.*

The jays moved on. Gray smoke rose vertically from the cabin chimney, joining the gauzy clouds that closed ranks above the ridges. Then everything was drenched by a gentle windless drizzle.

You can find the results of the 2015 Eugene Christmas Bird Count in the February 2016 issue of *The Quail*. Here's the link: [http://www.laneaudubon.org/sites/default/files/quail\\_pdf/Feb2016\\_Quail\\_web.pdf](http://www.laneaudubon.org/sites/default/files/quail_pdf/Feb2016_Quail_web.pdf)



## Events of Interest in the Community

### Oregon Natural Desert Association

**Volunteer to help restore the Malheur National Wildlife Refuge.** Every year, ONDA's Stewardship Program works with hundreds of volunteers to restore areas of Oregon's high desert, including projects on the Malheur National Wildlife Refuge. As we all move forward together to restore the refuge once the illegal occupation is over it will be critical to coordinate volunteer efforts with refuge managers. ONDA is committed to ensuring a successful and smooth volunteer restoration effort. If you wish to be involved through ONDA, register at <http://onda.org/volunteerformalheur>.

### Lane County Audubon Society

**Saturday, 20 February, 8am. Third Saturday Bird Walk.** The location will be determined by interesting bird sightings posted to OBOL and other pertinent information available before the day of the walk. We will post the location on the LCAS Facebook page (<http://www.facebook.com/pages/Lane-County-Audubon-Society/330177413824?ref=hl>) and on the website (<http://www.laneaudubon.org>). All ages and skill levels are welcome. To carpool, meet at 8:00 a.m. at the South Eugene High School parking lot (corner of 19th and Patterson). We plan to return by noon. Remember that it's not a good idea to leave valuables or your vehicle registration in your car if you leave it at the lot. A \$3 donation is appreciated to help support Lane County Audubon's activities. For more information, contact Jim Maloney at 541.968.9249 or [jimgmal@comcast.net](mailto:jimgmal@comcast.net).

**Tuesday, 23 February, 7:30pm. MAPS Bird-Banding Station and Spotted Owls.** John DeLuca, wildlife biologist with the Bureau of Land Management (BLM), will give a two-part presentation about bird conservation on the Eugene District of the BLM. The first part of the presentation will focus on a Monitoring Avian Productivity and Survivorship (MAPS) bird-banding station that will begin operation this spring (a great volunteer opportunity for local birders and bird enthusiasts!). The second part will focus on Spotted Owl ecology and conservation on the Eugene District. The meeting is at The Eugene Garden Club, 1645 High St.

### Mt. Pisgah Arboretum

**Saturdays, 13 and 20 February, 10am-1pm. Work Party: Invasive Species.** Help us remove blackberries from the Water Garden to free up space for wildflowers in time for spring. Meet at the Arboretum Visitor Center. Parking pass provided.

**Sunday, 21 February, 8:30am. Late Winter Bird Walk.** Join Chris Roth and Julia Siporin for another monthly bird walk intended for people with all levels of birding experience. Please bring binoculars. Option to continue the walk until noon for those who are interested. Rain or shine. Meet at the Arboretum Visitor Center. \$5, Members free.

**Saturday, 27 February. 10am-noon. Lichens Walk.** Join botanist Daphne Stone on an easy stroll through the Arboretum exploring lichens, their habitats and ecology. 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. 9am-noon.** Contact [volunteer@bufordpark.org](mailto:volunteer@bufordpark.org) for more information.

**Tuesdays and Thursdays, 9am-noon. 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.

### Walama Restoration Project

**Saturday, 20 February, 10am-1pm. Community Saturdays Work Party.** Join us to learn about and protect critically imperiled Willamette valley habitat via non-chemical prairie-restoration techniques such as: selective invasive species removal, site preparation and maintenance, shade fabric maintenance and removal. No experience is necessary, and gloves, tools, instructions and refreshments will be provided. Meet at the Whilamut Natural area in East Alton Baker Park, just north of the Knickerbocker Bike Bridge. Email [krystal@walamarestoration.org](mailto:krystal@walamarestoration.org) or call 541-484-3939 for more information.

### WREN (Willamette Resources and Educational Network)

For current WREN events go to <http://wewwild.blogspot.com/>

**Tuesday, 8 March, 9-11am. Wetland Wander at Hansen See-Sil.** This month we'll wander through a unique and special site in the wetlands. The area is home to a variety of nesting bird species, prairie wildflowers and grass species. Directions to Hansen/See-Sil: 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. Look for the gate with BLM signage, and WREN staff.

### The University of Oregon's Museum of Natural and Cultural History

**Exhibit Hours: Tuesday through Sunday, 11am-5pm**

### Cascade Mycological Society

Go to <http://cascademycology.org/category/events/> for information on upcoming events and trips, such as the members-only trip on 21 February.

## Native Plant Society of Oregon, Emerald Chapter

### Thursday, 18 February, 7pm. Getting To Know the Biscuitroots: Lomatium Botany, Ecology, and Human

**Relationships.** "Biscuitroot", "cous", "Luksh", "wild celery", "desert parsley." These are just a few of the names used for the diverse species of the Lomatium genus, which covers a vast area of western North America. Heron Brae will dive into the identification, ecology, range, and historical and contemporary uses of Lomatium in our region, informed from Heron's own first-hand experience as a botanist and wild-food forager. Pictures, stories, and tasty samples make this an experience for everyone to enjoy, beginner and seasoned botanist alike. Meeting location: Conference Room at Lane County Mental Health, 2411 Martin Luther King Blvd. Turn off MLK Blvd. onto Scout Access Rd. across from Autzen and take the first left into the parking lot. The meeting room is on the right side as you face the building.

## North American Butterfly Association, Eugene-Springfield Chapter

Next meeting Monday, 11 April. Details next month.

## Nearby Nature

**Monday, 15 February, 8:30am-3pm. How do animals build their homes?** Try your hand at making a deer bed, a bird nest, and your own fort from the forest. Discover how to navigate in the woods with a compass and clues on this forest adventure. \$40 members/\$45 non-members. Ages 6-9, max 12 kids. Outdoors in Alton Baker Park and at our Yurt. To register, call 541-687-9699, ext. 2 or click [here](#).

**Saturday, 20 February, 11am-2pm. Friction Fire Workshop. Lessons in the Learnscape!** Join staff members from Nearby Nature and [Whole Earth Nature School](#) for a fire-making workshop at the Nearby Nature Learnscape. Practice using a bow drill to make friction fire and learn how you can make your own bow drill kit. \$30 members/\$35 non-members. Pre-registration and pre-payment required: call 541-687-9699 or click [here](#).

**Sunday, 21 February, 11am-2pm. Restoration Celebration.** Join Nearby Nature and Envision Journalism – an environmental journalism group from the University of Oregon – as we enhance the entrance to the Whilamut Natural Area. We will be painting over graffiti, cleaning up the bridge, weeding our native wildflower bed, and mulching pathways through the brilliant wildflower displays of this place. \*\* The meeting location for this work party will be at the brown informational kiosk at the entrance to the park from the Frohnmayer Pedestrian Footbridge. For more detailed information on finding this location, please email [parkhost@nearbynature.org](mailto:parkhost@nearbynature.org)

**Saturday, 5 March, 6:30-8pm. Treefrog Tunes Nature Quest.** Enjoy a treefrog tunes walk in Amazon Park! Learn about – and listen for – Pacific treefrogs with ecologists Peg Boulay and Bruce Newhouse. Meet at the Amazon Playground. Members free, non-members \$2/person, \$5/family. Pre-register: 541-687-9699 or [nearbynature.org/pre-registration](http://nearbynature.org/pre-registration).

**Wednesday, 9 March, 6:30-8pm. Nearby Nature Spring New Volunteer Orientation** in the Tykeson Room at the Eugene Public Library. Learn all about leading school nature walks in Alton Baker Park, as well as other Nearby Nature volunteer opportunities (from gardening to restoration work to special events). No experience needed--training provided in April. Questions? Call Nearby Nature at 541-687-9699, email [info@nearbynature.org](mailto:info@nearbynature.org), or see <http://www.nearbynature.org/volunteer>.

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**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>**

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I (we) prefer electronic copies of NT rather than paper copies. \_\_\_ Yes \_\_\_ No

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<b>ANNUAL DUES:</b> Family	\$25.00
Individual	15.00
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<p><b>Annual dues for renewing members are payable in September. Memberships run from September to September. Generosity is encouraged and appreciated.</b></p>
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Dr. Binford (on right) and two co-workers at the mouth of a cave in a park called Sierra de la Ventana in Argentina. They were collecting spiders called *Drymusa*, relatives of *Loxosceles*, the genus that includes the brown recluse. The species was known there but no males had been collected before they found them on that expedition.

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### ENHS Schedule of Speakers and Topics for 2015-2016

<b>19 Feb. 2016</b>	– Greta Binford	– How the Brown Recluse Got Its Bite: Spider Venom Diversity And Evolution
<b>18 Mar. 2016</b>	– August Jackson	– Pollination Biology
<b>15 Apr. 2016</b>	– Rebecca Vega-Thurber	– Coral Reef Decline
<b>20 May 2016</b>	– Mark Blaine	– Copper River Salmon
Alternate	– Dean Walton	– History of Oregon Naturalists