

# Nature Trails

Published by the Eugene Natural History Society

Volume Forty-seven, Number Two, February 2012



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.

## **Evolution of Spider Venom**

Dr. Greta Binford,

Associate Professor of Biology,

Lewis and Clark College, Portland, Oregon

**Friday, 17 February 2012, 7:30pm, Room 100**

**Willamette Hall, UO Campus**

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 (she was back there last month, telling students about what she's up to, encouraging them to consider a career in science), 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 finished that post-doc and accepted a faculty position at Lewis and Clark College, in

Portland, Oregon, where she is now Associate Professor of Biology. 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, but their spider hunts are not confined to the Portland area. 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, and to China. In a few months they will be collecting in Cuba. Besides getting to go on these collection adventures, her students help raise the funds that make the trips possible. What wonderful experiential education!

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. (How about this

for an ad in the student newspaper: Lab Assistant to feed poisonous spiders. Remote possibility of necrotic epidermal lesions.) (But in all seriousness, these spiders have a bad press. They are not aggressive. In over 20 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, which is free, open to all, and comes complete with cookies. Don’t miss Professor Greta Binford’s talk, **Evolution of Spider Venom**, at 7:30 pm Friday, 17 February, in Room 100 Willamette Hall on the U of O campus.

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### **Kinglets, Warblers, and a History of Natural History**

by Reida Kimmel

Recently I acquired a lovely old edition of *The Natural History of Selborne*. The eighteenth century English pastor, Gilbert White, is considered by many to be the first scientific natural historian. I had never read this, his only book, but it seemed a good companion to Bernd Heinrich’s *Winter World*, which I had just started to read. *The Natural History of Selborne* is a collection of letters White wrote in the 1770s. He is chiefly concerned with birds, but he writes of much else: horrific weather events, fossils, hedgehogs, a lonely horse that adopted a chicken, a cat that nursed a baby rabbit, and the sex life of a local sow. Never a dull moment in the parish of Selborne! A century before Darwin, White wrote about earthworms and how their castings enriched the soil. His remarks about agriculture highlight the era’s preoccupation with breeding better crop varieties and livestock. He was the first to distinguish the Noctule (*Nyctalus noctula*) from England’s two other large bat species. Where possible, he used Linnaeus’s system of classification, still in its infancy. At the time, there was much confusion about species that today are popularly divided into amphibians and reptiles. For him newts were reptiles.

What makes this slim volume such an important work are White’s concern with migration, and his pioneering work in using bird song to identify species. Of course, like all his naturalist contemporaries, he shot or caused to be shot, those creatures that he wished to study. The catalog of the dead is appalling to modern sentiments, but White was also interested in what he could learn from song. There are three closely related species of warblers, “willow wrens” (*Phylloscopus*) in England: the

Chiffchaff (*P. collybita*), the Willow Warbler (*P. trochilus*), and the Wood Warbler (*P. sibilatrix*). The Chiffchaff and the Willow Warbler look very much alike and frequent the same areas, but their calls are very different, and different also from the Wood Warbler that lives in high woodland. The call of the Chiffchaff “the smallest willow wren” is unmistakable, an endlessly repeated “chiff chaff”, while the Willow Warbler calls a “sweet plaintive note”. The Wood Warbler calls out like a loud bell from tall trees. From actually listening to the birds as well as studying physical markers, White was the first to distinguish the three species.

White’s deep concern with migration is a powerful recurring theme. Many letters catalogue the seasonal comings and goings of bird species. His predecessors had believed birds hibernated, possibly in the mud at the bottom of ponds. White could not possibly know just how far birds can actually travel in a migration, but knew from his brother in Gibraltar that huge flocks passed across the Straits each fall and spring. But Britain’s smallest bird, the Goldcrest, (*Regulus regulus*), virtually identical to our Golden-crowned Kinglet (*R. satrapa*), does not migrate. How can such a tiny thing survive the cold of winters that at least in North America can dip to below minus twenty Fahrenheit? White called it the Golden-crowned Wren, that “feeble shadow of a bird”... “its note as minute as its person”. He noted that in winter it “keeps aloof in the woods”, not sheltering in the village’s structures. That, he said, is why so many perish in the winter.

Heinrich, in *Winter World*, weaves a tale of many creatures keeping alive in Maine’s harsh winters, but the Golden-crowned Kinglet (*Regulus satrapa*) is the main object of his and his students’ studies, as they strive to discover the tiny creature’s survival

strategies. The Golden-crowned Kinglet has an exceptionally rich and dense undercoat of down. Indeed it does not seek out any dens or nests, but often huddles and shivers with companions at night. A student once found a single kinglet on a dry perch under snow-covered branches, but that is as close to a den as anyone ever saw. Kinglets are in constant motion in the trees during the short winter days, always feeding. What do they eat? Everyone supposed they fed on springtails, but when Heinrich dissected several kinglets, he found their stomachs contained only caterpillars. No one had known that caterpillars spent the winter under bark, but when Heinrich and the students shook fir and hardwood branches, hundreds of caterpillars fell to the snowy ground. Heinrich hatched and reared some of the caterpillars, discovering a new species of moth in the process. In the end, Heinrich, like White, realized that indeed, very many kinglets perish each winter.

How then can the species continue to flourish? Kinglets persist, he concluded, because they rear so many young. A female kinglet lays up to ten eggs in her beautifully constructed nest. And after the chicks hatch, the female leaves the male to feed the babes while she makes another nest and again fills it with many eggs. Successfully rearing two big broods every year, of which maybe two offspring will survive the winter, is the key to the kinglet's survival. If only White, an amazing observer of nature in his own time, had had a good set of modern binoculars, what joy he would have had observing the kinglets' nests. For him the birds were lost in the high woods once the trees leafed out. How wonderful for us that there are still old-fashioned field naturalists who can combine modern tools and old-fashioned observational skills to probe Nature's mysteries.

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**Eugene Christmas Bird Count Summary** (Ed. note: Dick Lamster's general statement is followed by Dan Gleason's summary of the actual sightings. To see the complete table, look at the February 2012 issue of the Lane County Audubon Society's newsletter, *The Quail*. You can access it online at [http://www.laneaudubon.org/library-sub/quail\\_pdf/2012-02-feb-quail.pdf](http://www.laneaudubon.org/library-sub/quail_pdf/2012-02-feb-quail.pdf))

Fog and cold weather met the 140 bird watchers on Sunday, 1 January 2012, as they began looking for birds on the 2011 Eugene Christmas Bird Count (ECBC). This was the 70<sup>th</sup> ECBC and 112<sup>th</sup> National Audubon Society (NAS) Christmas Bird Count. 26 teams, each led by an experienced birder, searched for birds from dawn to dusk in their assigned areas within the traditional 15-mile diameter circle. Eight teams searched for owls before sunup and a couple of teams even did some owling after the sun went down. The summary by Dan Gleason that follows will present the results of these efforts. The 26 teams looked for birds for a combined total of 235 hours, walked 117 miles and drove 491 miles. The weather did warm up by late morning and the sun even came out for a little while in the afternoon and the birding just got better and better.

As the birdwatchers in the field were getting cold and trying to identify birds in the fog, 99 feeder watchers were counting birds in their backyards. Herb Wisner coordinated all these feeder watchers, sent them a checklist to help them keep track of the birds they were seeing, and then received the results and sent the total to Dan Gleason. Dan combined those totals with the results of the 26 teams in the field and submitted it to NAS. The results of our Count and the over 2,200 other Christmas Bird Counts can be viewed at [www.christmasbirdcount.org](http://www.christmasbirdcount.org). Our Count code is OREU. Dick Lamster, Count Coordinator

#### Dan Gleason's Summary

As Eugene birders took part in the Eugene Christmas Bird Count on 1 January 2012 they were fortunate to have no rain, but the weather remained cool and foggy much of the day. Several observers remarked about low numbers of birds, but when totals came in, many species had higher than average numbers.

Field participants recorded a total of 132 species on count day plus 2 additional species (Cinnamon Teal and Western Tanager – a very good find for this time of year) for count week, which were missed on count day. Low numbers were mostly reported for species where fog made it difficult or impossible to see birds overhead or at a distance. Canada Goose, gulls, American Pipits, and Red-winged Blackbirds are examples of such species that were probably present in greater numbers than could be observed. However, 44 species were in significantly higher numbers than average and of those, 14 were in record high numbers and 5 tied the previous record high. All in all, these are very good numbers, especially considering the weather many of us dealt with all day.

A Red-naped Sapsucker, found and photographed by Thomas Meinzen and the group he was with, was a new species for the Eugene count and a very good find for the Willamette Valley. The Western Tanager is also a bird far out of winter range and not to be expected. A few other unusual species found were: Golden Eagle (also seen on one previous

count), Say's Phoebe (4 previous times), Tree Swallow (on 11 previous counts and becoming more regular), Northern Mockingbird (12 previous counts), Common Yellowthroat (8 previous counts), and Chipping Sparrow (11 previous counts).

Species in record high numbers were: Bufflehead (145), American White Pelican (5), White-tailed Kite (31), Red-shouldered Hawk (36), Golden Eagle (1, ties previous high), Prairie Falcon (1, ties previous high), Virginia Rail (12), Eurasian Collared-Dove (133), Barred Owl (2), Anna's Hummingbird (167), Red-naped Sapsucker (1, first appearance), Black Phoebe (22, more than double last year's high of 10), Bushtit (1,342), Wrentit (21, ties previous high), Western Bluebird (207), Northern Mockingbird (2, ties previous high), Orange-crowned Warbler (9), Common Yellowthroat (1, ties previous high), and American Goldfinch (343).

It is interesting to note the increase of some species in our area as they expand their range northward. This would include White-tailed Kite, Red-shouldered Hawk and Black Phoebe. Additionally, there are more sightings of species not usually present in winter. No one saw an Osprey, although a few observations have been noted in recent years during the winter in western Oregon. Swallows are becoming more regular and Orange-crowned Warblers have come to be expected in small numbers during the winter. It will be interesting to see where this trend leads in the future.

**Field trip fully booked.** This year's ENHS field trip, 1 through 3 June, when we will stay at the Oregon Institute of Marine Biology, visit the tide pools at Cape Arago and hike the trails at the South Slough Estuarine Reserve in Charleston, has no more spots available. If you want to be put on the waiting list in case some people drop out, please e-mail me, Reida Kimmel, rkimmel@uoneuro.uoregon.edu or call me at 541-345-4919.

## Out and About

*"Out & about" is a periodical encouragement to Eugene Natural History Society members to get out and experience our magnificent Oregon. Photos and descriptions provided by David Stone.*



### Finley National Wildlife Refuge

Take a stroll on this new 1/4 mile boardwalk trail to a great viewing blind in Finley National Wildlife Refuge, about 10 miles south of Corvallis. Look for geese, egrets, and, if you're lucky, a bald eagle or two.

This boardwalk is an easy, flat walk also suitable for walker and wheelchair users. Find the short road to the trailhead across from the big red barn toward the north end of the main Refuge road.

## Events of Interest in the Community

### Lane County Audubon Society

**Tuesday, 28 February, 7:30 pm. Chile: Easter Island to Cape Horn via Patagonia.** Bob Fleming will take us on a tour of Chile, starting in Easter Island, where enigmatic stone statues may have a message for us. Then we'll continue to southern Patagonia and visit the lower slopes of the Torres del Paine National Park, home to Porcelain Orchids and Andean Condors. Then we'll move south to the glaciated Darwin Range, on the island of Tierra del Fuego, where Magellanic Penguins and the Lenga species of Southern Beech are found. In the Tierra del Fuego National Park we'll see the Magellanic Woodpecker and the Patagonian Swimming Fox. While the Beagle Channel, with its Black-browed Albatrosses, marks the southern boundary of Tierra del Fuego, other islands, including the rather substantial Navarino, appear even farther south, with Cape Horn Island the last speck of land before the Drake Passage. Eugene Garden Club, 1645 High St.

### Mount Pisgah Arboretum

34901 Frank Parrish Rd., Eugene, 97405. Located off I-5 Exit 189, 15 minutes southeast of Eugene. Call Peg Douthitt-Jackson at 541-747-1504, email [mtpisgjp@efn.org](mailto:mtpisgjp@efn.org), or look at <http://mountpisgaharboretum.org/> to find out about current Arboretum activities.

**Saturday, 11 February, 10 am-Noon. Liking Lichens Walk.** Open your eyes to the once-hidden beauty of lichens, exposed after the leaves have fallen. The Arboretum is home to many species of these unique organisms. Explore the symbiotic relationship between algae and fungi that creates lichens, and learn about their ecological importance in Oregon forests. All levels of expertise are welcome on this walk, led by lichen expert Daphne Stone. Rain or Shine. No registration required. Meet at the Arboretum's Visitor Center. Fee: \$5.

**Saturday, 25 February, 1-3 pm. Life Among the Mosses Walk.** This is our annual celebration of the little folks of the plant world. Botanist David Wagner will tell moss stories and weave lichen yarns to help us understand the elfin world of mosses, liverworts, and lichens. Rain or Shine. No registration required. Meet at the Arboretum's Visitor Center. Fee: \$5.

### Nearby Nature

**Saturday, 11 February, 1 – 4 pm. Restoration Celebration.** Join Nearby Nature and U of O volunteers for a restoration work party in **Alton Baker Park!** Tools and gloves provided. Bring a refillable water bottle.

**Monday, 20 February, 8:30 am – 3 pm. River Rhythm and Rhyme No School Day Program.** Discover your rhythm and rhyme with Rhian Pyke, the drummer from Dance Africa. Create instruments from recycled stuff, learn new dance moves and drum beats, and discover the song of the river as we explore Alton Baker Park. Cost is \$30 for members and \$35 for non-members. Program limited to 12 children and scholarships are available, so enroll soon! For more information, call 541-687-9699, ext 2.

**Saturday, 25 February, 6:30 pm – 8 pm. Treefrog Tunes Nature Quest.** Meet at the Amazon Park playground and go on a family-paced treefrog tunes walk. Learn all about (and listen for!) Pacific treefrogs from local Ecologists Peg Boulay and Bruce Newhouse. FREE for members. \$2/person, \$5/family for non-members. Pre-registration suggested: 541-687-9699

### Museum of Natural and Cultural History

**Wednesdays, 11 am – 5 pm. Free Admission Wednesdays.**

**Fridays, 1 pm and 3 pm. Guided Tours.**

**Saturday, 11 February 1 – 4 pm. Happy Birthday Darwin! Family Day.**

**Saturday, 18 February, 11 am – 5 pm.** Last chance to visit "Face to face with masks from the museum collection.

**Saturday, 25 February, 11 am – 5 pm.** Last chance to visit "4 Women, 4 Views: From the High Desert."

**Friday, 9 March, 6 – 8 pm. Explore Oregon in the Making – Kickoff Event.**

### Native Plant Society of Oregon, Emerald Chapter

For information on current activities contact [ngap@emeraldnpsoregon.org](mailto:ngap@emeraldnpsoregon.org) or look at <http://emerald.npsoregon.org/>

**Monday, 13 February, 7:30 pm. Flora of the Wallowa Mountains in Northeastern Oregon.** Dave Predeek will discuss and share pictures of unique plant species of the Wallowa Mountains and the relationship with flora in other regions of the northern hemisphere. EWEB Training Room, 500 E. 4th Ave. Information: 541-345-5531.

## WREN

For information about upcoming events call 541-338-7047 or email [info@wewetlands.org](mailto:info@wewetlands.org). You can also go to their website: <http://www.wewetlands.org/>

**Tuesday, 14 February, 9 – 10:30 am. Wetland Wander on the Tsanchiifin Trail.** WREN Wetland Wanders are casual walks through various West Eugene Wetlands sites, the second Tuesday of every month. The Tsanchiifin Trail was named after the band of Kalapuya Native Americans who lived in this area. This half-mile trail leads visitors through a wet prairie of *Deschampsia caespitosa* (Tufted hairgrass). This area was an important resource for the Tsanchiifin people and still provides diverse habitats for a variety of plants and wildlife. This wander will be led by WREN staff and volunteers. Participants are asked to meet at the Yurt adjacent to the Red House/WREN's office, at 751 S. Danebo Ave. Dress for the weather. WREN will provide binoculars. FREE!

## Brain Development Lab, University of Oregon

**Saturday, 10 March, 1 – 4 pm. Brain Awareness Expo.** This is the first annual Brain Awareness Expo, put on by the Brain Development Lab. It is part of the larger National Brain Awareness Week, which is sponsored by the Dana Foundation. At our expo, researchers from various disciplines (mainly psychology and neuroscience) will set up tables with information and hands-on activities that relate to the brain. Examples include optical illusion, sensory perception, a brain coloring station, a discussion of the brain from an ethological perspective, prism adaptations, real animal and human brains to see/touch, selective attention activities, and more. Most of the tables will have some kid-friendly activities, with more in-depth info for adults as well. The event will be held at WOW Hall. It is free and open to the public.

**We welcome new members! To join ENHS, fill out the form below. You will receive *Nature Trails* through December of next year. Membership payments allow us to give modest honoraria to our speakers, as well as to pay for the publication and mailing of *Nature Trails*.**

**Our web address: <http://biology.uoregon.edu/enhs/>**

## MEMBERSHIP FORM

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): \_\_\_\_\_

<b>ANNUAL DUES:</b>	Contributing	20.00
	Family	15.00
	Individual	10.00
	Life Membership	300.00
	Contribution	_____

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

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

The following information is voluntary, but appreciated:

Would you like to: \_\_\_lead field trips \_\_\_teach informal classes \_\_\_work on committees?

What would you like to hear a talk on? \_\_\_\_\_

Do you have special experience in natural history: \_\_\_\_\_

INTERESTS: \_\_\_Archaeology\_\_\_Astronomy \_\_\_Bird Study \_\_\_Botany \_\_\_Conservation \_\_\_Geology \_\_\_History of Science \_\_\_Herpetology \_\_\_Meteorology \_\_\_Mosses & Lichens \_\_\_Mushrooms \_\_\_Nature Walks \_\_\_Wildflowers \_\_\_Zoology \_\_\_Other \_\_\_\_\_



Brown recluse spider

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## ENHS Schedule of Speakers and Topics for 2011-2012

- 17 Feb. 2012** – Greta Binford – Evolution of Spider Venom  
**16 Mar. 2012** – Gordon Grant – Willamette River Hydrology  
**20 Apr. 2012** – TBA  
**18 May 2012** – Robert M. Pyle – Butterflies

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