

# Nature Notes

Pajarito Environmental Education Center

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Your Nature Center in Los Alamos

## Interpretation ... What Does That Mean?

by Jonathan Creel, Director of Interpretation

This is a familiar question to anyone in the field of interpretation, and each "interpreter" will answer this question differently. Interpretation, at least in this context, is not converting information from one language into another. The National Association for Interpretation says "interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource." But, what does that really mean?

In very simple terms, interpretation answers the question many visitors to natural and cultural sites have, "Why do I care?" People care about different resources or tangibles (things you can see and touch) for a multitude of reasons based on their own experiences and personalities. Interpreters provide meaning by linking these tangibles to their intangible meanings. For example, we use water for a variety of reasons on a daily basis, so it is a great tangible resource. Yet, water has many intangible meanings, such as power for creating spectacular canyons and, in the past, survival for pioneers or native people on arid lands. The last intangible meaning for water, survival, is what interpreters refer to as a "universal concept" because it holds significance to almost everyone, even if it is not the same for

each individual. By focusing on these intangible meanings, interpreters foster an emotional or intellectual connection to a tangible resource that people did not previously understand or consider.

The interpreters' goal is sharing their enthusiasm for a subject or place, finding intangible meanings people may share, and developing important and powerful ideas that provoke a personal emotional or intellectual connection. When people establish this connection, it leads to a more complete understanding; those who leave an effectively interpreted site realize how connected they are to the natural and cultural history that surrounds them, and how that affects the present and the future. Pajarito Environmental Education Center's mission -- enriching people's lives by strengthening their connections to our canyons, mesas, mountains, and skies -- ties directly to the idea of interpretation. Whether it is a program that provides information on the Rio Grande Cutthroat Trout, or a hike to a spectacular vista, we seek to instill a sense of wonder and provide opportunities for discovery.

Personally, Los Alamos opened my eyes to the natural world and to possibilities I never imagined.  
(Continued on page 2)

In the cover photograph, Elisa Giorgi seems to be communicating with Rosa, the remarkably tame New Mexico milk snake in PEEC's exhibit hall. Elisa was a volunteer animal caretaker assistant and her mother, Elena Giorgi, took the photo.

## Interpretation (continued from page 1)

I visited this place during a Public History course and, after hiking on Deer Trap Mesa, picnicking on the East Fork of the Jemez River, and visiting Bandelier National Monument, I completely changed my life goals. I realized how discovering a new place, seeing new sites, and learning about different subjects can cause a greater self-awareness and help people discover their true passion. Encouraging others to visit these incredible places and help strengthen people's connections to amazing natural places became my ambition, and interpretation provides that opportunity.



found 10 new species – most in White Rock Canyon, which seems to refrain from showing all of its species when there's no rain. This year it's putting on quite a show.

This canyon is one of Northern New Mexico's most fascinating regions. North of it along the Rio Grande it's all farm land, and south of the river most of its rich vegetation was wiped out when Cochiti Lake flooded in the early 1980s. It is important because it is a "triple-point" location, harboring plants from the eastern plains, southern Chihuahuan deserts, and northern high desert habitats. Many of our records are the most northern or western found in the State.

## Rains Bring Out New Species for Los Alamos County

By Chick Keller

Los Alamos County has an amazing variety of plant species, given its small size. Part of this is due to our more-than-a-mile range in elevation, from hot, desert-like White Rock Canyon to cool montane Pajarito Mountain. When PEEC started its Jemez Mountain Herbarium (a library of collected and pressed plants), there were only about 700 species known to be in the county. Many of these were found in the 1970s and 80s by PEEC's own Terry Foxx and others working in LANL's environmental program. Terry's identifications were all the more amazing, given the small number of identification books available back then. More recently, thanks to an active and dedicated number of plant lovers and new, excellent plant identification books, the number of species in our county has risen dramatically. PEEC's current plant list has grown to a remarkable 974 species!

When we had only about 750 species, Dorothy Hoard estimated that there were actually 1,000 species in the county. I told her: not a chance. So she bet me a pizza party that we'd arrive at her number some day. We're only 26 species away!

How fast are we finding new species? Well, in past years we've been finding about 10 per season. One reason for this small article is to announce that, largely due to our recent rains, we've been finding more this year. In the past three weeks alone we've



Our recent discoveries include a bulrush in the water, an eastern plains grass on the Blue Dot Trail, a tiny spurge and an annual paintbrush down by the Rio, and a foul-smelling gourd plant sprawling under the junipers at the bottom of Blue Dot. We also collected several plants known to be in the county but not in our

herbarium: *Delphinium wootonii*, *Goodyera repens* (a small orchid), and yellow-orange *Zinnia grandiflora*, which grows well in PEEC's xeric garden but is a southern New Mexico plant. (See drawing above.)

How long till the "1,000 species pizza party"? Well, if we can find 10 new species a year, that would be 2018. But if (as is more likely) we find fewer and fewer each year as we reach our maximum, it could take longer. Perhaps one of you younger persons will have become interested in our native plant heritage and be the one to do this. If so, go to the old folks home and invite me to the pizza party! Feel free to visit me in the Herbarium at PEEC on Tuesday afternoons to see what's going on.

*Zinnia grandiflora* drawing source: [www.desert-tropicals.com/Plants/Astroceoe/Zinnia\\_grandiflora.html](http://www.desert-tropicals.com/Plants/Astroceoe/Zinnia_grandiflora.html)



Remember, all issues of Nature Notes are on the PEEC web site: [www.PajaritoEEC.org](http://www.PajaritoEEC.org). Current issues are posted IN COLOR a bit after printing. To subscribe to each issue online in color; see the web site Publications pull-down on the home page.



## Cold Birds

by Esta Lee Albright

Photo and anecdote by Susan Larocque

It was a very cold morning. I bundled up in a blanket as I sat on the couch watching the birds chow down anything edible on or near my deck. Soon I noticed several of them looked a little like tennis balls with an added projection on top: the fluffed feathers making a round body and the head nestling as far into the shoulders as possible – no legs. Birds sitting on the deck floor or railing had completely hunkered down on their feet!

A google search brought me to a question from “Ask a Scientist” that ended up in the Cornell University Center for Materials Research. A fifth grader had asked why birds’ legs don’t get frostbite, and I was glad to read an answer at any level. The answer started with the typical birds’ body temperature: 104 degrees F.; then birds shiver their flight muscles to generate heat. Feathers top it all off like a down jacket. Birds have a habit of standing on one leg and burying the other in warm feathers – or squatting like the birds I saw and covering both legs and feet. The next method I read surprised me.

“Some birds, [such as] gulls and penguins, have a very special trick. Like all other animals, birds send the warm blood of the body into the legs, and this helps. But, unlike most other animals, many birds do this in a special way; the blood vessels going into the legs lie right next to the blood vessels leaving the legs. So, as the nice warm blood from the body flows next to the cooler blood leaving the feet, that cooler blood gets heated up before re-entering the

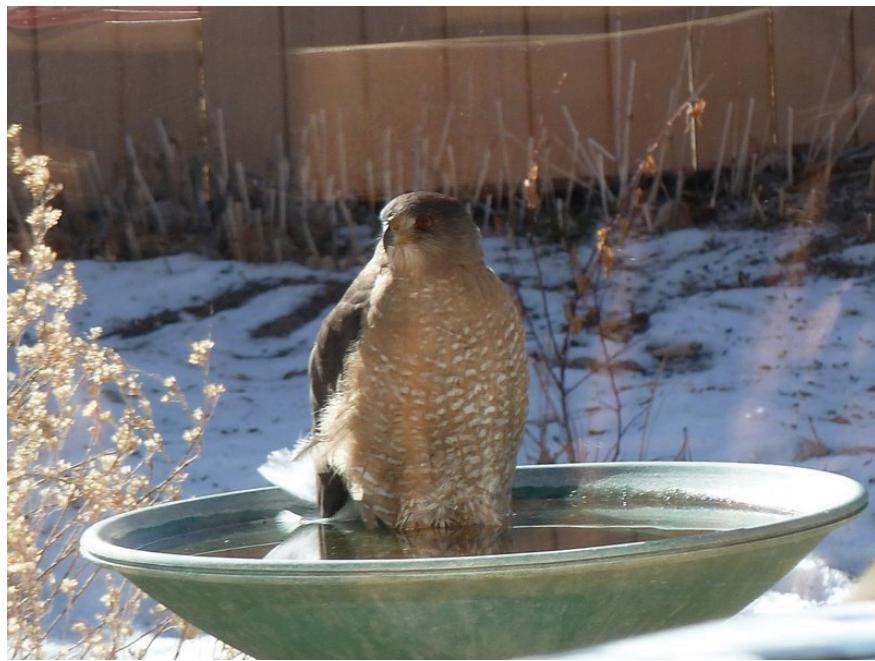
body. This prevents more heat from being lost to the cold air than is necessary, which is a key part of not losing cold [body] parts to frostbite.”

([www.ccmr.cornell.edu/education/ask/?quid=967](http://www.ccmr.cornell.edu/education/ask/?quid=967))

Next I read there are scales on birds’ feet that may not be as prone to frostbite as bare skin. The idea of scales on legs and feet sent me to google again. I learned that some birds have low sensitivity in their legs and feet because of scales, which are specialized to minimize heat loss in extremities, thereby reducing heat loss even further.” Scales are made of keritan, the same substance in beaks and feathers, our own fingernails and hair, horns on animals, and baleen in some whales’ mouths.

I had seen birds waking, stretching and fluffing feathers in the sun to get warm, but I was concerned to read about torpor. “Torpor is a state of reduced metabolism when the body temperature is lowered, therefore requiring fewer calories to maintain the proper heat... Torpor can be a dangerous behavior, however, as the reduced temperature also leads to reduced reactions and greater vulnerability to predators.”

([//birding.about.com/od/birdingbasics/a/howbirdskeepwarm.htm](http://birding.about.com/od/birdingbasics/a/howbirdskeepwarm.htm))



Birds will find anything that helps. Susan Larocque posted the following message on PEECBirders about a Cooper’s hawk taking advantage of her heated birdbath.

“It was quite a surprise to see the hawk sitting so placidly in the bird bath. (I usually see it sitting on our fence, flicking its tail in annoyance because all the little birds have vanished!) It usually does not stay in our yard very long, but this time it

just sat in the water for about ten minutes with an uncharacteristic serenity about its body. I think it was truly enjoying itself!”



## Critters of a Different Color

Just when we think we have learned to identify animals based on their colors, along come critters with spots, patches, or even entire coloring that isn't covered by field guides. An unexpected puzzle, such differences can be caused by leucism, which is a condition of reduced pigmentation. This is caused by a genetic mutation that prevents pigment, particularly melanin, from being properly deposited on a part of the body. Melanin is a dark biological pigment found in skin, hair, feathers, scales, eyes, and some internal membranes. ([www.britannica.com](http://www.britannica.com))



Leucistic canyon towhee Photo by Bob Walker



Leucistic gray-headed dark-eyed junco Photo by D. Yeamans

The results include unusual white patches, paler overall coloration, and little or no color for an overall white appearance. All vertebrates (mammals, birds, reptiles, amphibians, and even fish) can have leucistic mutants.

Dave Yeamans found a gray-headed dark-eyed junco in White Rock that had black and brown normal feathers mixed with leucistic white spots. Bob Walker noticed a partially-leucistic canyon towhee in his yard in December 2013. The bird may have stayed in his yard awhile then, and he reported it again in September 2014, feeding its offspring. Both the canyon towhee and the dark-eyed junco had normal coloration on their legs, feet, and bills.

Besides confusing bird-watching humans, leucism brings special challenges in the wild. "Lighter plumage may rob the birds of protective camouflage and make them more vulnerable to predators such as hawks and feral cats. Because plumage colors play an important role in courtship rituals, birds with leucism may be unable to find strong, healthy mates. Melanin is also an important structural component of feathers, and birds with extensive leucism have weaker feathers that will wear out more swiftly, making flight more difficult and eliminating some of the bird's insulation against harsh weather. White feathers also reflect heat more efficiently, which can be fatal for birds that rely on sunbathing and solar radiation for heat in northern climates."

(Source: Melissa Mayntz, "Bird Leucism," web site //birding.about.com/od/identifying\_birds/a/leucism.htm)

Albinism is another genetic condition that can produce a surprising white appearance overall. It is different from leucism. In birds, for instance, leucism affects only the plumage, especially dark feathers with a melanin pigment. Eyes, legs, feet, bills, and some feather colors appear normal, while feathers that should be black or brown are pale or white. Albinism affects all pigments; albino birds show no color at all in their feathers. The bird's skin and eyes are affected; albino birds have pale pink or reddish eyes, legs, feet and a pale bill.

If a bird is unusually-colored, birders must rely on size, shape, range, feeding habits, and behavior for identification. Comparing unusual-looking birds with other birds may help. Selvi Viswanathan saw a strange site at her feeder, “It was a stunning bird when I saw it the first time while I was sitting on my front porch. It came to the feeder for almost a week. I did think it may be some kind of grosbeak because of the large beak.” (Notice the beak in Hari Viswanathan’s photo of the leucistic black-headed grosbeak that visited Selvi’s feeder.)



Leucistic black-headed grosbeak Photo by H. Viswanathan

Project Feeder Watch began collecting data about plumage variations in 2000. Between 2000 and 2007, 1,605 Unusual Bird Forms were submitted. Of the 5.5 million birds reported each winter, a very small fraction have any kind of plumage variation. ([//feederwatch.org/learn/unusual-birds/](http://feederwatch.org/learn/unusual-birds/))

A color morph is another type of genetic color difference. Animals with variant color morphs must occupy the same habitat at the same time as the rest of the population, and, if the morph is to persist in the population, they must have random reproduction within it. Studies have been made of color morphs in wild cats, dolphins, reptiles, and purple sea stars, just to name a few.

Birds with plumage different from the standard colors of the species may represent color morphs, but this applies only if the variant birds are adults and

maintain the color differences throughout different seasonal molts. All birders know about the confusion caused by juvenile birds as they mature toward adult plumage. Another situation is the dimorphic birds that have different plumages between the sexes. A color morph is a color variation that can affect either sex.

Throughout their lives, some bird species are known for different plumage morphs, such as birds of prey, especially red-tailed hawks. Songbird morphs are rare. As an example, a birder in Pennsylvania made a study of “green morph” pine siskins that are present there. (<http://home.earthlink.net/~pomarine3/id8.html>)

Melanism is the phenomenon of increased black pigmentation, which makes the animal darker than usual. It is rare. Various web sites show startling photos of black-colored animals. The Project Noah web site ([//www.projectnoah.org/missions/7970027](http://www.projectnoah.org/missions/7970027)) shows melanistic mammals and provides a succinct comparison of color changes, “ Examples include leucism (reduced pigmentation), albinism (complete absence of pigmentation), melanism (increased black pigmentation), piebald animals (unpigmented patterns), color morphs (genetic mutation) ... ”

Various sources of information underline confusion about color labels, including leucism and color morphs. The degree of coloration or its place in the overall population sometimes isn’t clear. What do you think about the bear cub in the photograph on the next page by Barbara Calef?

“I was hiking off trail in Bandelier when I saw a large brown bear,” wrote Barbara Calef. “She began to move away as I took the picture. It was only then that I saw the cub.”

Barbara was writing about a hike in November 2013, east of the Burro Trail in Bandelier National Monument. Looking down on the cub’s back she saw that the cub had brown ears and tail but the back was covered by light, amber-colored fur. We assume this cub was the offspring of the adult local

(continued on page 6)

Black Bear species in the photo. What can be the explanation for such an exotic sight?



Photo by Barbara Calef

While we wonder at the many ways animals change their colors, we may accept the challenge to study the unusual ones. The more records we keep and the sightings we record increase our chances of realizing we are seeing something really amazingly different.

Web sites with more information and photos:  
[//birding.about.com/od/birdingglossary/](http://birding.about.com/od/birdingglossary/)  
[//for the loveof herpetology.tumblr.com/](http://forthe loveofherpetology.tumblr.com/)  
[//en.wikipedia.org/wiki/Leucism](http://en.wikipedia.org/wiki/Leucism)  
[//birding.about.com/od/identifyingbirds/](http://birding.about.com/od/identifyingbirds/)  
[//feederwatch.org/learn/unusual-birds/](http://feederwatch.org/learn/unusual-birds/)  
[//www.wildlifeextra.com/go/news/leucism.html#er](http://www.wildlifeextra.com/go/news/leucism.html#er)

*Editor's note: thanks are due the many observers who contribute to the PEEC interest groups, and to Jennifer Macke, who gave scientific and editorial expertise to this article.*

For more about PEEC's interest groups, see  
[http://www.PajaritoEEC.org/outreach/outreach\\_index.php](http://www.PajaritoEEC.org/outreach/outreach_index.php)

## Bighorn Sheep Are a Big Surprise

In September a few startled Los Alamos people saw wild four-legged ungulates not far from their own positions. Quick photo-taking helped in comparing sightings and identifying the two or more different individuals as bighorn sheep, *Ovis canadensis*.

There are three major subspecies of bighorn sheep in this country and two are found in New Mexico: Rocky Mountain bighorn sheep (U.S. and Canadian Rocky Mountains) and desert bighorn sheep (U.S. southwest and Mexico). The visitors were Rocky Mountain bighorn sheep, which are thought never to have been widespread in New Mexico. Historical evidence is for just four populations in Wheeler Peak, Pecos Wilderness, White Rock Canyon, and Manzano/Los Pinos Mountains. Currently the NM Department of Game and Fish sometimes trap bighorn sheep out of populations that reach carrying capacity and translocate them within the state to augment numbers or fill vacant historical habitats.

Bighorn sheep are named for the large, curved horns borne by the rams (males). Ewes (females) also have horns, but they are shorter with less curvature. They range in color from light brown to grayish or dark, chocolate brown, with a white rump and lining on the backs of all four legs. Bighorns from the Rocky Mountains are relatively large, with males that occasionally exceed 500 lb (230 kg) and females that exceed 200 lb (90 kg).

These sheep were among the most admired animals by the Crow people who lived north of New Mexico. They attributed to them power, wisdom, sharp eyes, sure-footedness, keen ears, great strength, and strong hearts.



Photo by April Wade.

Sources: [http://en.wikipedia.org/wiki/Bighorn\\_sheep](http://en.wikipedia.org/wiki/Bighorn_sheep);  
[http://www.azgfd.gov/pdfs/w\\_c/bhsheep/LongRangeBighornPlan2005.pdf](http://www.azgfd.gov/pdfs/w_c/bhsheep/LongRangeBighornPlan2005.pdf)

From the Executive Director,  
Katherine Watson

## Craig Martin in a Box

During the early stages of our capital campaign, we met with lots of people in the community to tell them about the exhibits we were planning to build with the money we hoped they would give us. One of the most popular items we mentioned was what we fondly called, "Craig Martin in a Box." Our CMIAB would provide nature center visitors with custom trail recommendations. Want to hike three miles, with a dog, and see wildflowers? Or is it windy and you want to know the best sheltered trails where you might also see birds? CMIAB would give you a map, directions, and pointers about the perfect trail for you.



For those of you who don't know, Craig is the Los Alamos County Open Space Specialist. Boring title, but it basically means he knows all there is to know about every trail in Los

Alamos. He keeps the trails in shape, decides when they need to be re-routed, and cleans up after floods and fires. He's also written many books about Los Alamos and hiking, including *Los Alamos Trails* and *Los Alamos Place Names*.

Unfortunately, all this keeps him too busy to hang out in a box in the nature center, handing out trail recommendations. Fortunately, we've come up with a work-around.

CMIAB has been redesigned as the Los Alamos Trails App. Instead of being in a box, the app will live on iPads at the nature center, on your phone, or your tablet at home. You'll be able to select your criteria (such as season, length, elevation change, "good for \_\_\_\_\_", kid-friendly, pet-friendly, viewpoint, etc.) and the app will give you the best options. It will give you a map, show you photos of the trail, and tell you interesting things to watch for as you go. And, while you're out, you can take pictures and send them back for others to see when they're getting ready to go out on the trail.

As of now we have funding to include about 25 trips in the app. We're looking for partners and sponsors to expand this reach, and lots of area organizations seem excited about the opportunity.

And what about Craig? Well, where do you think we're getting all the trail data we'll include? Craig might not be all that comfortable inside your phone, but we'll cram as much of his knowledge in there as we can.

Self-directed Hiking Trail Clipart Source:  
<http://www.clker.com/clipart-trail-path1.html>



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