



This summer and fall, kids have been getting outside in modified small-group Forest Explorers clubs! Campers worked together to build forts, observed birds and other critters, and much more. (Photo by Siobhan Niklasson)

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PAJARITO ENVIRONMENTAL EDUCATION CENTER, LOS ALAMOS, NM

Building an Outdoors for All

By Katherine Bruell, Executive Director

It's been a wild six months, hasn't it? The other day I thought back to the beginning of all of this when my biggest concern was, "what will we do if we have to shut the nature center for two weeks?" Ah, the innocence of March!

I've talked to a lot of people since then, and one recurring theme I hear is how lucky we are to live near nature. Most people say some variety of "I'm okay/more busy/less busy/going stir crazy/happy to have an excuse to stay home" and then they say, "But I'm so glad I'm in a place with access to nature right now. I couldn't imagine being quarantined anywhere else. The trails are still fairly empty, and they're so beautiful! I've been exploring a lot and found places I'd never been to before, right in our own back yard!" I hope if you're reading this newsletter, you feel similarly. I am so, so thankful to live in a place with a seemingly endless number of places to get outside and be in nature.

But every time I think about how lucky I feel to live here, I remember how many people don't live with nearby nature — not even a nearby pocket park where they can see some green and maybe a bird or two. At PEEC we believe that all people should have the opportunity to have positive experiences outdoors, regardless of where they live or their social or economic status. We know that when we make the benefits of



A participant in our Take It Outside program works in her homemade nature journal. The cover reads "One touch of nature makes the whole world kin." (Photo by Ellen Small)

outdoor experiences accessible to everyone, we build stronger connections and communities. This is truer than ever in the age of COVID. Being in nature is good for people's mental and physical health and provides a healthy escape from stress. Science has shown that the health and wellbeing of people and their communities improve when people connect and thrive outdoors. As we think about how to learn, grow, and rebuild from this pandemic, I hope we will remember that access to nature is essential for all of us.

I'd love to hear your thoughts about these issues. Write me at director@peecnature.org. 📧

Learn more about disparities in access to nature in a report from the Center for American Progress by visiting ampr.gs/35thZs3

Keeping Our Skies Dark

By Galen Gisler

We who live in Los Alamos County are privileged to enjoy good views of the night sky. We are blessed with many cloudless nights, and the lights of our small town do not prevent us from enjoying the spectacle of the Milky Way arcing across our summer sky. But even here, we could do much better. Have you stopped at one of the pullouts at the Valles Caldera (or at Tres Piedras) at night and been dazzled by the sight of thousands of stars? Then imagine that only 150 years ago, the night sky everywhere on earth, even in cities, was as splendid as the darkest places we know. We wonder now at the imagination of the Greeks and other ancient peoples, who populated the sky with storied lions, swans, and great warriors and maidens, and referred to the stars by their locations in the anatomies of fabulous creatures. In the PEEC planetarium, and planetariums around the world, we try to bring the magic of the night sky back by displaying the skies of our ancestors within the confines of an indoor dome.

The invention of electric lighting has made many things possible that were unavailable to our ancestors. But as with almost every invention there have been adverse effects. A live-streamed PEEC presentation on August 20 discussed effects of artificial lighting disturbing wildlife in their natural cycles of breeding, eating, and sleeping. Efforts by the National Park Service to mitigate those effects are underway in certain parts of our country. But it is not only wildlife that suffers from the overuse of artificial light. Many people lack good sleep because of light trespass: floodlights from neighboring buildings, or streetlights, shining through their bedroom windows.

We need lights for our nighttime activities and for safety. Yet much of the light we generate is wasted: it goes up into the sky instead of illuminating the ground where it is needed. Bright lights shining horizontally create blinding glare, impairing rather than improving nighttime visibility. Dark shadows between bright lights are harmful to public safety. Better use of lighting saves money and conserves energy.

Los Alamos County is presently engaged in redrafting its Development Code, chapter 16 of the County Charter. Part of that code is an ordinance that addresses outdoor lighting. Several cities and towns

in our region, including Tucson, Flagstaff, and most recently Jemez Springs, have introduced sensible new lighting ordinances that take advantage of the latest technologies to conserve energy and reduce the adverse effects of artificial lighting. We have obtained copies of those ordinances and samples developed by the International Dark-Sky Association, and with them we plan to contribute to the improvement of the Los Alamos County lighting ordinance.

We can all help by learning how to tell good lighting from bad lighting; adjusting or replacing the outdoor lights at our homes; and encouraging the businesses that we frequent to do the same. Visit the webpages of the International Dark-Sky Association (<https://www.darksky.org>) to learn more. 🌑



Jumping Spiders are appropriately named creatures. Most can jump up to several times their body length! (Photo by Julie Leininger)

Spider to the Rescue!

By Marilyn Lisowski

Eek! Spiders!! What should you do? Step on them?

Stop!! These segmented, multiple-eyed arachnids roam your home like miniature security guards. Holes in your woollens? Carpet beetles? Silverfish? Call the spider brigade!

Spiders exterminate more insects than anything else. Without them, insects would devastate farm crops. A spider will not crawl onto you and bite you. It may be carnivorous, but you're of no use to it for food. They bite rarely, only if threatened, and the bite (except for black widows and brown recluses), is almost never serious.

The arachnid family crawled through millenia from a primitive, silk-spinning eight-legged creature that lived in the thick moss and fern forests of 300 million years ago. Almost 4,000 species of spider fossils have been discovered.

Today spiders number over 45,000 species, many more of them than us, so we may as well be friends. They crawl, jump, climb, and spin silk almost everywhere on the planet. We smash, spray, and swat them. Imagine caring about them, carting them outside, or merely allowing them to survive to prey on troublesome insects inside your home.

Spider Woman, in Navajo legend, wove magnificent silken webs. She taught Navajo people to weave beautiful rugs. Like Spider Woman, all spiders make silk through their spinnerets, located on the back end of their bodies. Silk comes out as protein liquid, like toothpaste, but hardens immediately. Some is as strong as steel, and some can be stretched twice its length. Silk quickly entombs a victim for snacking. Silk allows a spider to leap from limb to limb with a zipline, or descend from heights. Silk builds soft nests, and it makes egg sacs. It creates graceful webs or a kite to fly a spider in the wind.

Hunting techniques range from simple to bizarre. Web-building spiders weave sticky geometric circles to entrap hapless insects. Trapdoor spiders lie in wait below ground for a morsel to amble close to their hole. Purse-web spiders spin a hollow finger of webbing on the ground attached to their tunnel, and wait for a careless grasshopper to hop on it. Crab spiders must hide to ambush prey. One water spider spins its own diving bell, breathing trapped air while it waits for passing prey.

Female spiders contain developing eggs, so they usually grow much larger than the dispensable males. Mating involves an elaborate ritual that sometimes ends with the female consuming the ill-fated male. These extra calories help the female nourish her eggs. Some females even hypnotize their mates for less frenetic dining.

Brown spiders in your home? Could be one of the local species of wolf spider. Two black stripes on the head segment help to identify it. Like all true spiders, it has multiple eyes, palps attached to the cephalothorax, a separate abdominal section, and eight legs covered



Wolf Spiders are common brown spiders that are frequently seen inside homes. (Photo by Melissa Muir)

in sensitive hairs. As the spider grows, it molts and grows a new exoskeleton. Like other spiders, the wolf spider injects its prey with a venom that dissolves the insect and allows the spider to suck out the juice. But, unlike most spiders, wolf spiders have the excellent sight needed to chase prey. They grow to about an inch and a half across, a fearsome size. The female guards her eggs in an egg sac. When the young emerge, she carries them on her back for several weeks.

The harmless Daddy Long Legs is sometimes caught in slippery sinks or bathtubs. Its tiny oval body is one piece, not two, but it is an arachnid. Allow a trapped Daddy Long Legs to crawl onto a Kleenex and carry it outside. Set it down and the joyful creature will race away.

Black Widow spider bites are dangerous to humans. Black with a red hourglass-shaped mark on their abdomen, Black Widows are commonly found in messy webs in woodpiles, and under porches.

The large-eyed Jumping Spider species on the Pajarito Plateau sees best in daylight. It waits motionless for prey, then leaps on it with precision, and feasts. This cute, furry spider is harmless to humans. It spins little tents of silk to protect it from the elements while sleeping at night.

Where would we be without spiders? Overrun with insects! Guard them. Love them. Protect them. 🕸️



For the past few years, PEEC volunteer Jenna Stanek has tagged and released monarch butterflies in the nature center's gardens. (Photo by Rachel Landman)

The Story behind the Dorothy Hoard Gardens

By Selvi Viswanathan, Natali Steinberg, and Rachel Landman

As plans developed to build the Los Alamos Nature Center, the PEEC Board asked its Landscaping Committee to start planning our gardens. When the building site was almost finalized, Dorothy Hoard, Natali Steinberg, and Selvi Viswanathan visited the new location to select a sunny spot for the new garden beds.

We had learned a few things about gardening at the old PEEC location on Orange Street. Natali had a native plant garden that received a lot of sun, and the plants in it did very well. On the other hand, our Butterfly Garden was planted in a shady spot. It had a hard time attracting butterflies, and the plants didn't thrive in the shadow of pine trees. At our new location, we knew we wanted a garden in the sun and we wanted raised beds for easier access to the plants.

On our first visit to the new location, the site was muddy and covered in some snow. It was a bit hard to imagine how the gardens would take shape. But Dorothy came equipped with her imagination and a fancy electronic measuring device and started traveling around the lot, measuring distances and developing plans.

We discussed the size and shape of the garden beds. Natali came up with a brilliant idea and wrote down the words "finger mesas." We thought that modeling our beds after the finger-like mesas of Los Alamos would be a wonderful, appropriate addition to the nature center.



Natali Steinberg and Dave Fox watch with joy as the gardens take shape in May 2015. (Photo by Selvi Viswanathan)



Selvi Viswanathan filling up a watering can to tend to the newly planted flowers in the nature center's gardens. (Photo by Mary Carol Williams)

After the initial visit, we began to consider how many and what kinds of gardens we would have. We wanted them to be educational for local gardeners who might like to see examples for their own yards. Ultimately, we decided on three beds: a native plant and wildflower garden, a garden to attract pollinators, and a drought tolerant garden for home gardeners. At first, Natali took charge of the native garden, Selvi headed up the pollinator bed, and Mary Carol Williams oversaw the drought tolerant garden. That meant we had to select the plants we wanted to order when the beds were ready to be planted. We decided to order from the nursery that Dave Fox was still operating and he was a big help. Some of us utilized the help of landscape architect Cathy Strong for assistance in plant selection and layout.

Oasis Landscaping Construction was hired to build and fill our moss rock raised beds. We later discovered that raised beds are not practical for cutting back on water because they heat up and dry out quickly, especially those with rock around them. However, those of us who work in the gardens really appreciate the ease of sitting on the edge and just reaching into the center. Oasis also installed gopher wire before filling the beds. Then they



PEEC volunteer Sue Watts helping to lay irrigation in the pollinator garden bed. (Photo by Selvi Viswanathan)

filled the beds with a combination of native soil and good topsoil. Once the beds were filled, we installed irrigation lines on top. These would eventually use water collected in our large underground cistern, which held runoff water and snowmelt from the roof of our building.

Teams of volunteers helped out over the course of several days in early May 2015 to fill the gardens with plants. Two years later, the Los Alamos Department of Public Utilities also installed an exhibit outside of the Los Alamos Nature Center to help the public learn more about the gardens. We held a ribbon cutting and dedicated the gardens to Dorothy Hoard.

Dorothy dreamed of having a monarch butterfly project with PEEC. Today, our gardens and center are used by volunteer Jenna Stanek to rear and release butterflies in order to educate visitors about this important species. A new monarch enclosure was recently installed in front of the nature center to house caterpillars and chrysalises as they grow into butterflies.

Today, Natali oversees all three of the beds with the help of the Landscaping Committee and a team of volunteers. As with any garden, we've found some flaws in our design, replanted some species, and had some hiccups, but the three beds have carried on and educated the public since the nature center opened in 2015.

Recently, we even saw two new marvelous plants, a yucca and Indian paintbrush, appear in the native bed that must have been planted by birds. The plants within this bed have been so prolific that Natali has been able to give away seed every year and the plants have reseeded all over the nature center's landscape, including the slope next to the parking lot, to establish new gardens at the nature center. 🌱

New Mexico Naturalist: Joaquin Gallegos

New Mexico Naturalists is a new monthly series from PEEC highlighting the work and thoughts of people around the state that work or recreate in the outdoors.

Joaquin Gallegos is an Associate Professor of Environmental Science at Northern New Mexico College.



Get to know him in some highlights from our conversation.

How would you define a “naturalist”?

I would define a naturalist as an individual who recognizes that they are a part of the natural ecosystem and the land that surrounds them — it impacts us, we impact it. A naturalist is someone who attempts to understand that relationship.

What are your hopes or concerns for the future for nature in New Mexico?

Respect for what nature gives us here in New Mexico. What I find very beautiful, and I think why I love New Mexico, is that I consider our state to be a very marginal landscape. We are very drought-prone. Of course, the most limiting resource that we have here is going to be our water. As a result, I think we need to instill a very strong respect for that water, understand the limitations of New Mexico, and really try to live within those limitations.

Sometimes, growing up, people will tell you, “Be all you can be! You can do anything you want.” We have to understand that that’s just to us. We cannot project that out into the world. We cannot make a semi-arid or arid environment into a lush garden. We have to live oftentimes within the limitations of that ecosystem or environment.

Read our full interview with Joaquin, and meet our previous New Mexico Naturalists, by visiting peecnature.org/nm-naturalists.



The author's sons take an active break from school by climbing trees in the Jemez. (Photo by Karen Holmes)

Homeschooling and School at Home: Relationships over Results

By Karen Holmes

Has the school year got you down already? Between at-home remote learning and a lack of social activities, there are challenges for all of us. We've homeschooled for four years and I'd like to encourage you as we all figure out how to move forward with school by sharing some of the things that have worked for my family.

As the kids' teacher, I try to choose *relationship* over results or curriculum. Julie Bogart (www.bravewriter.com) claims that learning isn't happening when your child is crying. Yes, they may be *doing what you asked* but it's unlikely they're internalizing or retaining any information.

At that point, it's better to reaffirm the relationship than force your kid to complete a worksheet. There's a balance, for sure, between insisting on the work and sharing a bonding moment, but the more secure and loving your relationship is, the more likely your child is to cooperate. The curriculum is there to help your child, but if you can find a kinder, more enjoyable way to present the same lesson, go with it.

Similarly, allow school to be enjoyable and let your kids choose when they can. Let them do school on the floor or in a hammock. Let them lay on the couch to finish their assignments. Do math with chocolate chips and spelling with letter cookies. Create a rewards chart for meeting deadlines for a difficult project. "School" may



The author's 4-year-old son practices math using Cheerios. (Photo by Karen Holmes)

look like sitting at a desk and being quiet for hours, but "education" doesn't work that way! Take some time to really think deeply about your kids and what **learning** looks like for them. Leverage those insights to help them deal with the realities of classwork.

I've also learned to use the words "wise" and "respect" to great effect. Instead of saying your child is "smart" or "good," say that they acted wisely and you respect their efforts. Wisdom, to me, is thoughtfully applying what you know to a real-world problem. Respect is the outward recognition of another's personal dignity. Praise your kids for wise choices they make, even something as simple as using a pencil, and not a pen, to do their math homework. This also teaches kids that effectively applying what they know is more valuable than simply getting good grades. With "respect," if your child wants to watch school on the floor, say that you respect their choice and let them do it. You can state your respect for your child even when you disagree with them. Several times, I've changed the school dynamic by using these words with my kids.

One wise thing is to recognize when you or your kids need a break. Recently, my kids had meltdowns



The author's boys gather around the dining room table to enjoy a poetry teatime! (Photo by Karen Holmes)

over school. It was a disaster. They weren't going to actually learn anything even if they completed their lessons, so I grabbed snacks and went to Battleship Rock picnic area in the Jemez (not so easy, I know, for parents who are working). Hours later, they were calmer, happier, and cooperative. The rest of the week went much more smoothly. You can't do this everyday, but build time into your schedule to get outside or plan

a fun activity without any other agenda.

Read to your kids. Even if your kids are older, reading to them is the best thing you can do. Pick good books that allow for juicy conversations. Now is a great time to read books on racism or politics. The deepest discussions we've had have been instigated by books. And, stories fuel kids' imaginations and lay the foundation for good writing! You can hit every subject in-depth just by reading books with your kids. So, if the day falls apart, grab some cookies and a good book, read in your backyard, and call it a win.

Our children are *always learning*. Most of what they learn is from us! How we respond to them and these pandemic challenges will stick with them a heck of a lot longer than anything else we could teach. 🎧

WE WANT TO HEAR FROM YOU!

Is there something you'd like to learn about in the next edition of Nature Notes? Would you or your child like to write an article or share some art?

Let us know! Email publicity@peecnature.org to share your ideas or feedback.

Our Mission: Enriching people's lives by strengthening their connections to our canyons, mesas, mountains, and skies.

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Summer Fun

"This week's PEEC camp has been positively therapeutic and very enjoyable for my child. He's raved about Ms. Ashleigh and the handful of kids he's met."

— Summer Forest Explorer Parent

Nature Center Hours:

The Los Alamos Nature Center is currently closed due to COVID-19. Visit us online to connect with us virtually and for updates on our re-opening.

Visit us online!

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Comet NEOWISE photographed over the Los Alamos Nature Center. (Photo by Rick Wallace)

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