Nature Notes

Pajarito
Environmental
Education
Center

Your Nature Center in Los Alamos

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Spring 2011

PEEC, *Mail*: PO Box 547
Los Alamos, NM 87544
505-662-0460
www.PajaritoEEC.org
Location 3540 Orange St.
Open Tu-F, 12-4, Sat., 10-1

President's Message

by Rebecca Shankland

PEEC has been humming all month with board members and volunteers creating activities for Earth Day 2011. The ideas just burst forth like the Easter daisies and Pasque flowers that greet hikers shaking out the winter fluff.

The Earth Day theme this year is simple – "Growing Green." Emma Starrett's charming logo symbolically captures all our ideas: a joyous outdoor family, a tree, a majestic raptor, a butterfly, a dragonfly, solar panels, a watering can, a bicycle, a gardening spade, windmills. Even the Earth is becoming greener – as Chick Keller pointed out, some of the northern hemisphere is sliced off, removing the worst carbon-users from the scene.

So what is PEEC doing to grow green?

- Our volunteers are creating an outdoor free-play area so that kids can just have fun being out in the sticks and dirt.
- Our High School and Middle School Environmental Clubs are going places like Washington D.C.'s Powershift conference to learn what they can do about climate change.
- PEEC's Science Fair winners investigated how to track otters, compost Sunchips bags, dry laundry outside, heat water with the sun, and cool houses with reflective roofs.
- LAPS art and PE classes went outdoors to gather materials for Earth Day art projects – see examples on display at Mesa Public Library.
- A new birders' online group is sharing alerts for first-of-the-season sights.
- A kids' garden group will be digging, planting, and harvesting this summer.
- A talk on pikas will offer an intriguing chance for citizen science monitoring.
- The butterfly garden, wildflower gardens, and bird-feeding habitat are full of life.
- Hikes, talks, classes are coming – PEEC has many new ways to explore the Pajarito Plateau this spring. Check out the Spring Program Schedule insert.

And what are the community and LANL doing to grow green?

- Our new natural foods coop market opened its doors, supported by local investors.
- Los Alamos County is building a solar array at the old landfill in cooperation with the Japanese and even building a demonstration smart house.
- Community leaders turned out in force to the Sustainability Town Hall last month.
- Atomic City Transit saved everyone money and cut our pollution and greenhouse gases.
- Businesses and individuals are signing up for LA Green to support renewable energy.
- LANL helped with the Gulf Oil Spill and NM natural gas outage – come hear about this work at our Earth Day talk by Donald O'Sullivan at Fuller Lodge on April 24.

See you all at PEEC's Earth Day Festival on Saturday, April 30!

Come on ❀ Grow Yourself Green
Make a good life for you, PEEC and the earth.

Mar. 27 - April 27: Art show at the Mesa Public Library
Apr. 7: Gala opening of art show 5:30 -7:30.

Apr. 16 - 24: Free admission to
Bandelier National Monument
for National Park Week
with special walks all week
(see PajaritoEEC.org for listings)
Apr. 18: Jason Lott, Bandelier National Monument
superintendent, will speak at
Bandelier Visitor Center, 6:30, free, with a
new film about the park, in the new theater.

Apr. 24: *Monitor* Earth Day Special Tabloid published.

Apr. 27: Dr. Donald O'Sullivan, LANL, will speak
at Fuller Lodge, "Foundations of a
Sustainable Society," free, 7:00.
Reception at 6:30.

Apr. 30: Earth Day at PEEC
Clan Tynker Renaissance Entertainment Group and
interactive displays, educational activities
and fun for all ages.

May 1: Party for PEEC
Dinner by PEEC's master chef Felicia Orth,
featuring foods that were brought
to the Americas by the early
Spanish explorers and settlers.
Hilltop House Best Western, 4:30 - 7:30.
Entertainment, auction, benefit for PEEC.
See PEEC web site for ticket details.

www.PajaritoEEC.org

Rio Grande, Valles Caldera, Jemez Mountains Summer Adventures

by Jessica Ross

Our Nature Odyssey and Living Earth Adventure Summer Programs are unique opportunities for kids entering grades 4-6 and 7-9 to explore the natural world that surrounds them. Not many kids are lucky enough to grow up surrounded by such a diversity of environments. For each program participants meet talented environmental educators in a variety of fields.

Nature Odyssey: *Wet 'N Wild Along the Rio Grande* (June 13-17) will be exploring all things wet, wild and wonderful along the river. Children participating in this summer program will learn about the variety of creatures that make their home along the water's edge. Along the way they'll search for petroglyphs and explore the ecology and geology of Tent Rocks and Cochiti Lake.

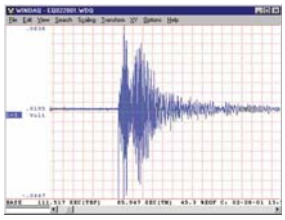
Nature Odyssey: *Where in the Valles Caldera Are We?* (June 20-24) will take kids on an adventure through the spectacular landscapes of the Valles Caldera. Using a variety of ways to orient themselves in relation to the sun, streams, mountains, plants and animals, participants will work together to improve their navigational skills. On their final day participants will explore Alabaster Cave with geology experts and finish with a dip in the Jemez River.

Our Living Earth Adventure Program (LEAP) (June 27-July 1) is a unique opportunity for middle-school students to explore the Rio Grande and Valles Caldera with local scientists and environmental educators. This summer's program will include an overnight adventure camping in the Jemez Mountains and a rafting trip.

This year send your kids on an adventure with the PEEC☼

PEECBirders Are Informal Yet Informative

This spring PEEC members are reporting the return of migrating birds in the dedicated online group formed just several weeks ago. Situated with Yahoo Groups, it already has 25 members posting sightings, experiences, photos, projects, help with identification, links, and plans for trips. Suggested by Stephen Fettig during PEEC's birding trip in January, we are taking the lead in forming a Los Alamos group of active bird watchers. Joining is easy. Instructions are at our web site: //PajaritoEEC.org/outreach/birding.php. PEECbirders are members of PEEC and becoming a member is easy on the web site, too. Group moderators are Esta Lee Albright and Heather Burke; let us know if you have questions: www.estalee@whalesail.com ☼



Moving Walls of Rock: Earthquakes Abroad and Here

by Siobhan Niklasson

On the afternoon of Friday, March 11 this year, two massive walls of rock suddenly shuddered past each other, shook Japan and shocked the rest of the world. The magnitude 9.0 earthquake was followed by a tsunami which devastated the northeast coast of the island of Honshu and precipitated a nuclear crisis.

As familiar as we are with the earth, its dynamism often catches us off-guard. Earthquakes are beyond our control, but we can understand a great deal about how they work.

To a casual observer, rocks seem stable and unmoving. But in fact, forces both global and local are constantly working on rocks, trying to move them. On a global scale, the continents are slowly being arranged and rearranged as a result of plate tectonics. Locally, a magma body might be pushing its way through the earth's crust, or a tree root might be extending into a crack, stressing the surrounding rocks.

In general, though, rocks are strong; they can stand up to a little push or pull. But when the stresses build up to a level that the rocks can no longer withstand, they break. And if a lot of stress has accumulated over a large area, a tiny failure in one place can shift the burden onto unbroken rocks nearby, load those beyond their breaking point, and ultimately result in a cascade of failures. In just seconds to minutes, a huge area can rupture catastrophically, releasing a burst of pent-up energy: an earthquake.

The magnitude of an earthquake depends on how strong the rocks are, how large an area ruptures, and how far the two sides of the fault slide by each other. An earthquake of magnitude 9 can occur only if a very large area moves. In the case of the Japan earthquake, the U.S. Geological Survey estimates that the area that ruptured was about 600 km long by 250 km wide, or about half the size of New Mexico. It took only about three minutes for this large area to fail. In parts of the fault, the two sides may have slipped by each other by 30 meters or more (*http://quake.usgs.gov*).

Japan lies on the notorious "Ring of Fire" circling the Pacific Ocean. There, tectonic plates are being driven toward one another. Where they collide, the denser oceanic plates dive underneath the lighter continental plates. These zones, where two plates overlap and grind by each other, can produce the world's largest earthquakes and also have the right ingredients for generating tsunami.

It is safe to say we won't experience a tsunami in Los Alamos, but we actually do live close to a fault zone: the 50-km-long Pajarito Fault System. This system comprises a number of related strands, most of which skirt the western edge of Los Alamos. You can see the fault at the top of the switchbacks on Highway 4 heading toward the Valles Caldera.

Unlike the fault that produced Japan's earthquake, the Pajarito Fault System is not associated with a boundary between two tectonic plates but instead accommodates deformation within a plate.

For the last 20 million years or so, much of western North America has been stretching from east to west. The Rio Grande Rift, which includes the Española and Albuquerque Basins, is the easternmost instance of this extension. As the continent stretches, the Española Basin drops down relative to the Colorado Plateau along the Pajarito Fault System.

The Los Alamos Seismic Network, established in 1973, records an average of two to five earthquakes a year on these faults (*http://www.ees.lanl.gov/archive/seismic.shtml*). The recorded earthquakes have been small, around magnitude three or less, but Los Alamos residents have occasionally been able to feel them, especially if they live on soft ground, which amplifies shaking.

Even if we have not experienced a large earthquake on the Pajarito Fault System in the last 40 years, there is geologic evidence that larger earthquakes, perhaps up to magnitude 7, have occurred on these faults in the last 10,000 years (*http://www.ees.lanl.gov/archive/seismic.shtml*). In human terms, 10,000 years is a long time, but it is a very short time in the life of a fault system. Therefore it is reasonable to expect that similar earthquakes will occur again along these faults.

A shortcoming of earthquake science is that it is impossible to predict with any confidence when an earthquake will occur, or how big a particular earthquake will be. As the disaster in Japan has showed us, the earth can take us by surprise at any time. The Pajarito Fault System could produce a large earthquake tomorrow or a few thousand years from now. As residents of a seismically active area, it behooves us to keep the earth's dynamism firmly in mind.

Graphic: Data acquisition instrument captures Seattle 2001 earthquake. www.dataq.com ☼

Los Alamos Wealth – in Native Plants

by Chick Keller

Photo: Kenneth Ingham, rare delphinium sapallonis,

www.explorenm.com/plants

photo copyrighted, used with permission.

Who would have thought it? Los Alamos County has perhaps the richest density of plant species in the state! At PEEC we've been collecting for five years and the number of species and varieties (including a few that have escaped from our gardens) now stands at an amazing 880. How did we determine this? It's a PEEC story.

I myself have been deeply interested in native plants since 1984, when I took a weekend class in alpine plant identification in Colorado. Now I get to work at PEEC's herbarium collections. This is exciting stuff, and it has a human side.

Los Alamos County has some of the most beautiful wild flowers in the area: Mariposa and sego lilies, wood lilies, yellow lady's and fairy slippers (both orchids), butterfly weed (not a weed but a gorgeous bright orange milkweed), rare yellow Parry's lousewort, five kinds of snapdragon-like penstemon, four kinds of Indian paintbrush, two kinds of gentian, the rare, pale lavender sapello delphinium, and more.

Some of these have been known for years. Others, however, have just come to light, and often it's just because people noticed them. Yellow lady's slipper, known in the Sangre de Cristo Mountains but unknown in the Jemez, was discovered by Brian Jacobs' mother-in-law on a family outing in Bandelier National Monument above Upper Crossing.

"What's that flower, Brian?"

"Oh my gosh!"

Yellow Parry's lousewort, usually a small plant found near the tree line in the Sangres but nowhere in the Jemez, was found by Roy Greiner as he wandered across the high meadow of Cañada Bonito. There it grows to nearly two feet tall. Botanists have been passing by it for some 50 years and never noticed it! Roy also re-found sapello delphinium (listed officially as a rare endemic). Terry Foxx had found it some 25 years ago but no one had seen it since.

Up in the northwest corner of the Jemez is San Pedro Parks, a veritable fairyland of rare plants. Janie O'Rourke came up to me with a small, plain sprig, one leaf and one stem, with little bubblets on it.

"I don't suppose this is anything interesting, is it?"

"Oh wow!"

It was moonwort, one of the rarest ferns in the state. Her discovery led to my taking an expert there and we found six species of moonworts. Many botanists have never seen one.

PEEC's herbarium has been a magnet for ordinary people to come by with their "mystery" plants or photographs. Some plants are pretty common, but others have been new to all of us. Several students are helping, and there is a growing number of interested adults, not experts, just interested observers. All of you can help if you just do one thing. On your hikes anywhere in the Jemez Mountains, notice any plants that don't look like the ones you usually see (you don't have to know their names to do this). When you come across such a plant, take a photo, break off a sprig that has flowers and/or seeds, and bring it in. I'm at PEEC Tuesdays, noon to 4:00 and Dorothy Hoard the same on Fridays.

Los Alamos and the Jemez Mountains have a rich natural plant heritage and PEEC volunteers are having fun discovering all of them. Why not join us, or at least enjoy our wonderful wild flowers. Check our web site and nature center displays on "What's Blooming Now," and just go outside and look. ☼

PEEC Recognizes Young Scientists

The LAPS district Science Fair was held on Saturday, January 23, 2011. The following students won awards from PEEC.

Elementary Division

Cool Roof Cool House? Effect of Roof Reflectivity
Joshua Strevell

Solar Water Heater
Bryce Gentile

Composting Sunchips Bags
Ruby Selvage

Junior Division

The Ants Came Marching Down…
Katherine Wang

Crack the Egg Secrets
Derek Selvage

Green Laundry
Jovan Zhang

Senior Division

Joe Abeyta See his project abstract below.

Prize-winning Science Fair Project: "Indicators of Otter Populations in Northern New Mexico"

by Joe Abeyta

Abstract

The purpose of this experiment is to determine the correlation between water quality (chemical, biological, and physical), geography, and the Northern river otter (Lontra canadensis).

1) Will river otters prove to be a positive indicator species of water quality?

2) Did the river otters affect the health of the rivers over time?

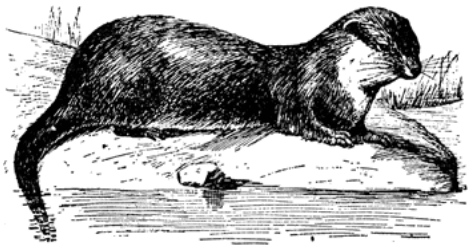
3) Does the geography of the area affect the population of the American river otters? If so, why?

To quantify these results, I will perform research on the locations where otters have been sighted. The water quality of these areas will be compared -- results from 2007 to results in 2009. Sites will be determined from Amigos Bravos research. I also will perform research on the geography of these areas.

Conclusions

The overall results of the rivers examined fell within range or close to research standards. The results from 2007 were similar to the results from 2009. So with this known, I was not able to prove that the river otters had an effect on the water quality over time. Since the results met standards, I was able to say that river otters are positive indicators of water quality. The geography of an area also had an effect on the river otter's population. Many standards were needed to be met before the otters were re-introduced. The rivers that best met these standards were the Rio Grande (near Taos), Canadian, Cimarron, Pecos, Gila and San Juan.

Drawing://etc.usf.edu/clipart



Note: *this project adds to data necessary for the re-introduction of the northern river otter to New Mexico.*

See the web page for Friends of the River Otter: www.amigsbravos.org/river_otter.php.

Excerpts: *The northern river otter is a large and strong semi-aquatic mammal in the weasel family. Highly social, playful, and possessing seemingly unlimited energy, they are a joyful sight to the lucky observer.*

Otters are more at home in the water than out of it, using water for hunting, frolicking, traveling, and as a refuge from danger. They thrive on a diet of crayfish, fish, and insects. They were once abundant in the rivers and streams of New Mexico. Pollution, deforestation and unregulated trapping caused their decline and eventual disappearance from New Mexico in 1953.

The river otter is viewed as an umbrella species indicative of the health and integrity of communities associated with streams and rivers.

Friends of the River Otter report that as of spring 2010, 23 otters have been introduced to the Upper Rio Grande. – Ed

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And the Turkey Vulture Winner Is —

Karla Sartor!

On March 19, she wrote that she and her husband saw two turkey vultures flying east to west over 39th Street in the Denver Steels area. "It was a quick look, but they had the classic dihedral and bouncy flight. It was about 6 p.m. Brian also feels like he likely saw one while riding his bike along Diamond Thursday morning near the Pueblo Complex."

Local birders have had a first sighting competition for years. The note above was posted on the PEECbirders group message page. See page 2 for information about the new birding group.

Solar Clothes Drying:
The Answer Is Blowing in the Wind

by Sue Watts

The oak grove wears a mist of olive green, and bright green patches among the crags announce new groves of aspen. Darker green pines fringe the hilltop. Two deer look up, already alert to the dogs and joggers on the path farther up the hill. They bounce away. Two acorn woodpeckers squawk away at each other. The dark ponderosa towering over me reminds me of a Georgia O'Keeffe painting. A mysterious flash of yellow against the dark green pines and deep blue sky has me reaching for my binoculars.

I peg the jeans to the clothesline. When we moved to Los Alamos, I hadn't planned on using a solar clothes dryer, but a temporary lack of space for a dryer sent me to the clothesline anchored to the planet in the back yard. I dug out the old clothespin bag decorated with a rainbow-quilted sunburst and headed out. Within a week, I discovered I was looking forward to doing the laundry. Hanging things in an evolving order was soothing. The sight of the clothes gently waving in the breeze was satisfying. Inhaling the scent of the dried clothes brought back memories. I could birdwatch.

"Get a life," a long-time friend groused.

Get a life? Hmmm...out at the clothesline, here's what I found:

Mystery: Will it rain? Will the clothes dry in freezing weather? How can it hail from a perfectly blue sky? Who left the scat on the wall? Why are there holes in the gopher mounds?

Humor: The clown-like acorn woodpecker loudly reminds me to fill the water dish. The socks fall in the dirt again (my mom: "if you can see the humor, you can survive").

Drama: Ravens mob a red-tailed hawk, which unsettles the turkey vultures from their sightseeing post on the rocks; a smaller raptor (a falcon? an accipiter?) chases them as they rise. Chaos ensues.

Food cycles: The ants busy themselves in my herb patch. A pair of flickers pick them off as they scurry over the wall, but the flickers duck for cover when the accipiter sails over.

Suspense: Will I slip on the ice? Will the clothes stay on the line in the gale? Can I get the clothes off the line before the thunderstorm hits?

And finally, romance: A hummer swoops by, showing off for the ladies. My husband helps me bring in the clothes by flashlight.

I realize that I have unusual circumstances. I am retired, so I have time. The two people wearing clothes in our household limit the number of loads I do a week. My clothesline is surrounded by the national forest. I don't have to worry about neighborhood covenants. But it isn't every day that I can fulfill a household duty, help the planet just a bit, and enjoy a quiet happiness.

Get a life? I think this qualifies.

Photo: http://www.photos8.com/view/raven_bird_wings_in_the_sky-other.html

Note: For a scientific report on how much energy is saved by drying clothes on the line, ask PEEC's Science Fair award winner, Jovan Zhang, whose project was titled "Green Laundry." ☼

Family Nature Connection:
Timing Is Everything

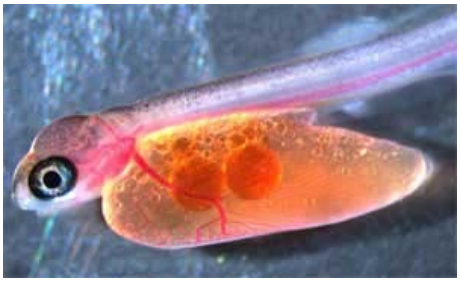
by Michele Altherr

Spring is bursting onto the landscape. Barren branches are budding with new leaves, familiar birds are returning from their wintering grounds, and graceful butterflies are emerging from their chrysalises. Spring is part of the greater cycle of the seasons resulting from the tilt of the earth as it makes its year-long journey around the sun. Animals and plants respond in rhythm to the annual changes in the weather that this brings.

One example is the effect of seasonal water temperature changes on our river ecosystems. Some of our high elevation rivers, such as those of the Jemez Mountains, are home to New Mexico's state fish, the Rio Grande cutthroat trout. During late spring, when the water temperature is just right and run-off from snow-melt has decreased, the Rio Grande trout will spawn along the gravelly bottoms of river riffles. If

the water temperature averages 51 degrees Fahrenheit, tiny alevin will hatch from trout eggs in about 21 days. If spring is late in arriving and the water is colder, hatching will occur weeks later.

During the alevin stage, the immature trout actually retains part of its nutritious egg yolk sac and can grow without having to hunt for food. Each alevin slowly begins to develop adult trout characteristics. Eventually, the yolk sac is absorbed and this coincides with the peak richness of food in the river.



(*Photo of alevin*: *Rebecca Kihslinger, UC Davis, Archives of Animal Science Blog, www.biology-blog.com.)*

The trout is now called a fry and feeds on the abundant aquatic and terrestrial invertebrates in the ecosystem. The fry grow into fingerlings and eventually become adults that live in cold clear streams below 60 degrees Fahrenheit and overwinter in deep pools that don't freeze. After four years of eating and growing, the cutthroats will mature and spawn, thus starting the cycle anew.

The study of nature's calendar, or the recurring cycles of plants and animals in response to seasonal weather changes, is called phenology. An English naturalist named Robert Marsham is considered the founding father of phenology. For 62 years, starting in 1736, he kept detailed records of changes in his local weather, as well as the dates of 27 annual "indications of spring." These included tree leafing times, flowering times, first butterfly sightings, and the arrival of migratory birds. As if this wasn't amazing enough, succeeding generations of the Marsham family continued his springtime recordkeeping until 1958. The result is a unique 222-year record of temperature effects on spring events.

Today many people have followed in Marsham's footsteps and you can too. You can start a special family calendar or notebook to mark down the first signs of spring that you see. When you see the first turkey vulture arrive or the first penstemon flower, write down the date, the temperature, and any other observations that you may notice. Then each spring repeat your observations. With time you, just like the Marsham family, will be able to compare whether the signs of spring have stayed the same or changed. There are organizations that collect citizen phenology data that are worth checking into if you are interested in helping. USA National Phenology Network: http://www.usanpn.org/ and Project Budburst http://neoninc.org/budburst/ . ☼

See a Live Wild Animal Species; Believe Its Importance

by Esta Lee Albright

"Seeing is believing" is an idiom first recorded in this form in 1639. It means "only physical or concrete evidence is convincing." *(Wikipedia)* It is too much to ask of books and pictures to provide experiences such as the glint of light touching scales on a moving skink, or the quick withdrawal of a turtle's head into its shell, or the flash of prettily colored fish as they play in air bubbles, or the personal impact of living, shiny eyes meeting ours.

A powerful asset to learning is the presence of emotion. The educational exhibit animals at PEEC give pleasure to viewers and belief in the reality of living, reacting, sentient animals in our local environment. There are twelve now. They are listed on fact sheets at PEEC, and a few are on our web site.

Animal exhibits director Jennifer Macke has designed habitats to illustrate each one's needs for a healthy life in the wild. She and her assistant Melanie Boncella spend many volunteer hours a week caring for them. Jennifer has tended a salamander through an eye infection, a hognose snake's refusal of food, a turtle's picky eating habits because he prefers worms over his veggies, a bullfrog's lightning quick lunge at a hand-held worm, a fence lizard's need to run and climb, and a scorpion giving birth, then carrying her crowd of young on her back.

Being impressed about learning from real animals is easy. Just watch children and adults pause at the tanks and habitats, read the fact sheets, become fascinated, and leave smiling. A step farther is to become a "parent" of one of the animals living at PEEC. Each can be "adopted" (gift adoptions, too) for a year. The $25 fee helps finance food, bedding, and improvements to habitats. Special visits can be arranged with the help of staff. An adoption packet includes a certificate, fact sheet and photo magnet. The names of "parents" are posted on the animal's tank. During the year volunteers send two or three updates about the animals' activities. The idea is to learn by seeing, reading, and believing.

Jennifer Macke will present the PEEC animals in a class on June 24, 10-11 a.m. in the exhibits room. ☼

PEEC
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PEEC This Week

weekly e-mail alerts about classes, events, nature and the environment. Anyone who has an e-mail account can receive them. To start, send a message to Webmaster@pajaritoeec.org. These weekly e-mail alerts always include PEEC activities and local information about nature. You also can contribute appropriate notices.

	General Membership	**$35**
	Living Lightly	**$20**
	Penstemon *Benefits of membership plus t-shirt or canvas shopping bag.*	**$60**
	Sunflower *Benefits above plus additional t-shirt or canvas shopping bag.*	**$100**
	Wild Iris Donor *Benefits above plus Muench coffee table book.*	**$250**
	Skyrocket Gilia Donor *We will contact you to determine how to recognize this generous level of donation.*	**$500**
	Wood Lily Donor *We will contact you to determine how to recognize this generous level of donation.*	**$1000**

	Non-Profit Sponsor *Newsletter and PEEC This Week for up to 3 organizational members.*	**$75**
	Corporate Sponsor *Newsletter and PEEC This Week for up to 3 organizational members.*	**$100**

PEEC's Mission Statement: To provide a nature center and outdoor education programs that allow people of all ages to explore the rich natural and cultural heritage of the Pajarito Plateau and to appreciate our connection to the natural world.

Joining Is Easy!

Tear off this form, fill it out, and mail it in with your check or go to the website www.PajaritoEEC.org. Do it today! Thank you.

Name(s): _____ Address: _____

Phone: _____ Number in Household: _____ E-mail: _____ ____ Please contact me about volunteering.

PEEC is a non-profit 501(c)3 organization. *Donations are tax-deductible.*

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Mail checks to: PEEC PO Box 547 Los Alamos, NM 87544 Att: Membership

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