Nature Notes

Bob Myers, Director of the American International Rattlesnake Museum in Albuquerque, for a Summer Family Evening at the Los Alamos Nature Center.

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The Las Conchas Fire in the Jemez Mountains: Causes, Effects, and Recovery

By Laura Trader, Ecologist, National Park Service

It's fire season again in New Mexico and the uncertainty can be unsettling. Living in a fire-prone landscape requires a heightened situational awareness – communicating and understanding fire safety, ecology, history, and management can improve situational awareness and foster fire-adapted human communities. Revisiting the causes, effects, and recovery of the Las Conchas Fire of 2011 is one place to start.

The Las Conchas Fire ignited in the Jemez Mountains at 1:00 p.m. on June 26, 2011, after a tree fell on a power line. The fire burned 157,000 acres with more than 44,000 acres consumed in the first 14 hours —averaging an acre of forest burned per second! —an unprecedented rate of fire spread in this historically low-to-moderate intensity fire regime.

Many of the biotic and abiotic factors that contribute to fire magnitude could not have been more aligned in the days and months preceding the Las Conchas Fire, New Mexico's largest wildfire at the time. Some of the factors included weather conditions, fuel moisture, forest structure and composition, slope, aspect, and elevation.

Maximum temperature on June 26 was 89.2 °F; high air

Headwaters of Capulin Canyon, July 2011
Photo Credit: Laura Trader

Headwaters of Capulin Canyon, July 2021
Photo Credit: Fire Ecology Program

temperatures increased fuel temperatures and reduced the amount of heat required for ignition and continuation of the combustion process. Minimum relative humidity (RH) was critically low at 5%, reducing fuel moisture content and increasing flammability of fuels. Total precipitation at that point in the water year was recorded at 3.7 inches, only 25% of average (14.7 in) for the 2000-2010 water years, with only three months remaining in the water year. Lack of precipitation contributed to rising air temperature and caused low RH and low fuel moisture. Maximum 150 ft. wind gusts, the primary driver of the fire, were 47.6 mph on the day of ignition. Winds were predominantly S-SW and had a strong effect on fire magnitude by increasing the supply of oxygen to the fire, reducing fuel moisture by increasing evaporation, causing preheating of fuels by pushing the flames closer to the fuel, and increasing the rate of fire spread. Wind also caused the fire to move through the tree crowns and spot ahead of the main fire.

Average live fuel moisture of ponderosa pine in the days surrounding the Las Conchas Fire was extremely low, at 101.9%. Douglas fir was recorded at 103.6%. Average dead fuel moisture was 7.9%. Low moisture content of fuels increased the ease of ignition, making fuels more available and more likely to be consumed in the combustion process, and increased the rate of energy released during the fire.

The frequent, low to moderate intensity surface fires of the past ceased in the Jemez Mountains in the late 1800's. With more than one hundred years of fire absence, forests have become over-crowded with trees and forest fuels have increased.

The Jemez Mountains are characterized by steep canyons, southerly exposures, and high elevations. As the fire moved up steep slopes, it dried fuels ahead of its flaming front, allowing for faster fuel consumption and greater fire spread. Southerly exposures caused heating and drying of fuels, contributing to the ease of ignition. Valleys and canyons channeled the wind and increased fire intensity and spread.

On a longer timescale, climate change - resulting in higher temperatures and increased drought frequency - and a land use history that includes extensive livestock grazing, logging, and fire suppression, has resulted in increased vulnerability

Native seedling trees to plant in Bandelier National Monument, 2020

Photo Credit: Laura Trader

of this landscape to fires of this magnitude.

The Interagency Fire Ecology Program, stationed at Bandelier National Monument, has collected fire ecology data and implemented repeat photography inside the Las Conchas Fire footprint to observe vegetation changes and recovery over time.

The Fire Ecology Program is a monitoring and science partnership between the National Park Service (NPS) and US Forest Service (USFS). The Fire Ecology Program collects and analyzes vegetation and fuel data and photos before and after forest thinning, slash/wood pile burning, broadcast prescribed fire, and wildfire.

Fire Ecology data collected in the Las Conchas Fire area show that previous prescribed fire and thinning in Bandelier contributed to the resilience and recovery of the landscape in some areas by creating forest conditions more resistant to extreme fire behavior. Trees in areas that had been thinned or burned had lower char heights, scorch heights, and percent of their crown scorched versus trees in non-thinned areas.

Repeat photography over a 10-year period in high severity areas of the Las Conchas Fire shows increases in vegetation cover and less potential for erosion and flooding in canyons. Photos and field-based observations also show that some previously forested areas may permanently convert to grasslands and shrublands. Restoration efforts in high burn severity areas include planting of native seedling trees. The Fire Ecology Program is tracking their survival over time.

Wildland Mitigation Measures and Preparedness in Los Alamos County

By Kelly Sterna, Division Chief, Los Alamos County Fire Department Wildland Division

Wildfires are a natural part of Los Alamos County and surrounding forests. We live in the wildland-urban interface here, where homes and other structures intermingle with wildland vegetation, so you are at risk of being affected by wildfire. Planning ahead and taking action can increase the likelihood your home survives when a wildfire occurs. LAFD encourages citizens to familiarize themselves with the Ready, Set, Go! Program.

LAFD will always do their best to reduce fire damage, but ultimately, it is the homeowner's responsibility to protect their property from wildfire. Taking practical steps to prepare your home does not guarantee it will survive a wildfire, but it does improve the odds. Any work completed may also allow firefighters who might be present to safely engage the fire and attempt to protect your property. If fire and site conditions are unsafe, firefighters will not be there.

As you address the home ignition zone on your property, always start with the home or structure and work outwards. Remember, taking action to prepare for wildfire is not a one-time effort — it requires ongoing maintenance to give your home the best chance of surviving a wildfire.

The likelihood the materials in and on your home will ignite during a wildfire is known as structural ignitability. The ideal time to address home ignition risk is when the structure is in the design phase. However, you can still take steps to reduce the ignitability of an existing home. See below for recommendations.

Finding My Way

A letter from our new Executive Director, Jillian Rubio

I have learned over time that each place has its own set of questions that get asked of newcomers when they arrive. For example, New Yorkers often ask what you do/where you work? (translation: how interesting are you to me and do we belong in the same circles?) Southerners often ask who you know/what church you go to? (translation: I want to welcome and connect to you, and are you one of my people?). The two questions I've gotten most often in Los Alamos are: "Where are you from?" and "Do you have a place to live?" My translation of this is: people arrive here from a variety of places, and there is a shortage of housing. Did I get that right? I have only just arrived.

Where am I from? Well, for the past two years I have been mostly nomadic, bouncing around the country sometimes with family and friends, and in a variety of other circumstances: house sitting, camping, and exploring. Covid times have been interesting for everyone, and for me, I have spent that time reevaluating who I am and where I want to be in the world. I am grateful and excited to say that my journey has led me here to Los Alamos and to PEEC. Previously, I spent most of the last two decades working in the environmental and outdoor education field in New York City. Before that I lived, worked, and studied in Tucson, Arizona. And a little-known fact: I actually grew up in the south, just outside of Atlanta.

Do you have a place to live? I have a summer sublet. So if you know of an available place, please let me know! It's rough out there, and I will take all the help I can get 😉

It has been an exciting few weeks as the new Executive Director at PEEC! My official first day in Los Alamos was May 31, and the community both, here with PEEC and around town have been incredibly warm and welcoming. My first week, I was humbled to stand on stage at the Chamber Business Awards to receive the Family Friendly Business of the Year Award, on behalf of PEEC. What an honor to stand next to so many of Los Alamos's amazing leaders!

Mostly, I am in awe of our extraordinary volunteers and staff and the outpouring of support that I observe and experience. Every day I meet a new and welcoming member of our community. People who give their time to support a place that they love in order to help others learn more about the amazing natural resources of Northern New Mexico. I am so grateful to be here and to get to know all of you. Please stop by the nature center and say hello. I am looking forward to being a part of this community and getting to know you.

Best,

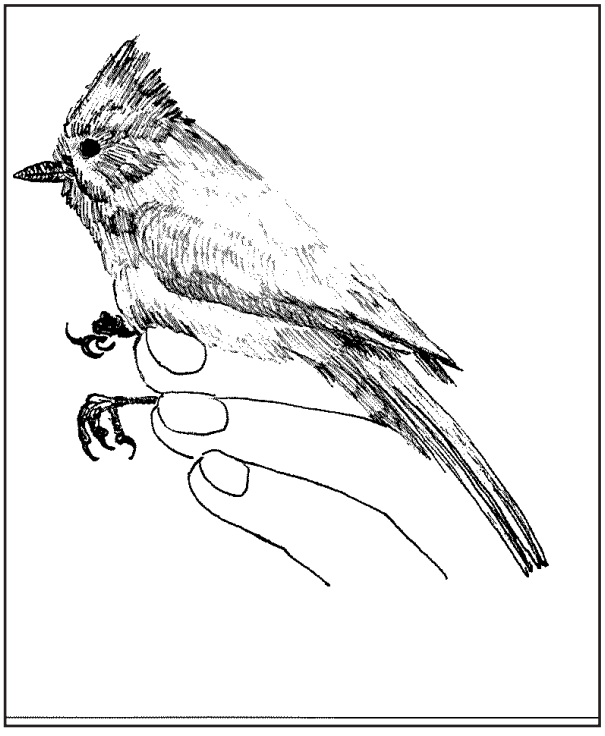
Jillian

Climate Change: Up Close and Personal

By Natali Steinberg, PEEC Volunteer

Ever since the Canyon Rim Trail opened over ten years ago, I have tried to walk it year-round, three days a week, not only for the exercise and the fresh air but for the vegetation that grows there. I loved watching the progression of flowering plants and how they moved around the area from year to year. I got in the habit of keeping a record of everything I saw, when the male junipers were rust colored with pollen that made everyone allergic, when the Gambel Oak got its catkins, when the Indian Paint Brush bloomed, etc.

My records show that until last year there were at least 40 species of native perennials that bloomed between mid-March and the middle of June. Even after the drought became so predominant, most of them continued to grow and bloom but in lesser numbers. Suddenly, in 2021 there were less than ten and this year only Yucca has survived to a halfhearted bloom. Even the Stork's Bill (Erodiium) which used to grow profusely in the driest places, has not appeared.



An original sketch from Pat Stein from the 1992 Breeding Bird Atlas.

This is a real firsthand look at what drought has done to our native plants. Walking the trail now, I am fortunate to see that the shrubs like One-seed Juniper, Gambel Oak, Wax Currant, Three-leaf Sumac and Mountain Mahogany are all still managing to put out leaves. The Pinyon Pines and Ponderosa Pines have managed to survive as well, I think their roots must be deep enough to find moisture far down. But at the base of those shrubs and trees, the only thing surviving in addition to yucca are two species of Artemesia and a few hearty grasses.

I'm sure all of you home gardeners have noticed how dry it's been and have needed to use more water to keep your green things alive. Unfortunately, out in nature there's no one to provide additional moisture. I imagine the reason the Indigenous people who left Chaco Canyon 1,000 years ago is that they were having the same kind of drought we are experiencing now.

I still enjoy walking the trail and still look everywhere for signs of life. But the place that used to give me real joy finding new species is now a barren sandy desert. Fortunately, we don't rely on this area for our life-sustaining food and we can more easily adapt to the drought.

Recent Acquisitions at the Nature Center

By Joyce Wolff

Some PEEC members will remember when, in the spring of 1984, a small band of Los Alamos birdwatchers calling themselves the Pajarito Ornithological Survey (POS) set to work on what would become an eight-year project surveying the breeding birds in Los Alamos County. The county was divided into equal squares that were monitored for five to six years by POS members assigned responsibility for surveying a given square or squares. When the data collection was complete, it was carefully analyzed to become in 1992 the Atlas of the Breeding Birds of Los Alamos County, New Mexico, (Breeding Bird Atlas or BBA) authored by James Travis, illustrated by Patricia Stein, sponsored by the POS, and published by the Los Alamos National Laboratory.

That Atlas can be found in the nature center observation room in the bird section on the library shelves .

Recently PEEC received several of Patricia Stein's original sketches for the BBA, as a gift from Gloria Travis. They are now archived at the nature center along with a copy of the first Breeding Bird Atlas. Pat did all the 112 sketches for the first Atlas and felt it appropriate to use photographs from local birders as models rather than using field guides or reference books. There are a few additional sketches in the notebook of birds that didn't make it into the Atlas, presumably because they were expected, but no breeding evidence was found.

The bird sketches notebook also contains two recent articles from the LANL Retiree Group (LRG) Newsletter March 2022. One article by this author, describes the first BBA for the county. The second by Mouser Williams, describes in excellent detail the second BBA now in progress and draws interesting comparisons between the two publications. Data collection for the new Atlas ended the first of 2022 and the lengthy review of the 50,000 breeding bird observations is now underway. When the next Breeding Bird Atlas is published, the comparison to the first will be invaluable in assessing the changes in breeding bird numbers and behaviors that have changed and evolved in the past 40-plus years.

In addition to the BBA sketches, PEEC has also obtained, courtesy of Sally Fitzgibbon and Bob Walker, several copies of the 1992 Atlas of the Breeding Birds of Los Alamos County. They are available and free to anyone who stops by the nature center requesting one. To any curious birder wanting to learn about breeding bird behavior in the county, the BBA is valuable.

For more information about breeding bird Atlasing* in this country and around the world please search the internet for many interesting and informative articles.

*There is some discussion regarding the proper spelling-"atlassing" or "atlasing." I found that atlassing is considered American English whilst atlasing is American. But I'm sure the birds don't care.

More of Pat's sketches can be seen in her notebook in the observation room at the nature center.

Electric Vehicle Show, Part of ScienceFest Discovery Days!

With the rising cost of gas, electric vehicles are becoming increasingly popular. Participate in our electric vehicle show on **July 16th from 10 am —3 pm** in several ways:

- Show off your electric car or bike! Sign up to be a participant at the EV show by contacting caroline@peecnature.org.
- Try out an electric bike! FreetoRoam ebiking from Santa Fe will be here from 10-2 with free test rides.
- Build a solar car! Pick up a solar car kit from the nature center July 12-15. Follow the instructions, or customize it however you'd like. Then bring it to the EV show at 1pm to participate in our solar car race. Prizes for both fastest and best-looking cars. If you had a kit from last year's ScienceFest, you are welcome to enter that as well.

The Electric Vehicle Show is sponsored by the Los Alamos Department of Public Utilities.

Get Outside with New Mexico Outdoor Pass!

Created by Pajarito Environmental Education Center and Los Luceros Historic Site, the New Mexico Outdoor Pass (NMOP) is a FREE booklet including FREE community events for families where everyone gets rewarded for spending time outside. Participate in an activity every 1st Sunday of the month and get a stamp for your New Mexico Outdoor Pass booklet. Fill your book with stamps and redeem them for prizes!

More information is available at:
peecnature.org/events/

Looking for More Adventures?

Become a PEEC member!

Becoming a PEEC member means receiving reciprocal benefits at other nature centers, special member pricing for events, discounts at the gift shop, a quarterly newsletter, and much more. By purchasing an annual membership, you enable our organization to operate the Los Alamos Nature Center and share the amazing natural beauty of Northern New Mexico with people from all over the world!

More information is available at:
peecnature.org/support/membership/

PEEC
Pajarito Environmental Education Center

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

Providing a family friendly space

"...The staff are kind and knowledgeable and brought out a snake for the kids to touch. They have a great selection of nature books for kids and adults, too. I always bring visitors from out of town to PEEC."

— Los Alamos Nature Center visitor

Nature center hours:

Monday: 10 – 4
Tuesday: Closed
Wednesday: 10 – 4
Thursday: 10 – 4
Friday: 10 – 4
Saturday: 10 – 4
Sunday: Closed

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We were voted Family-Friendly Business of the Year in this year's Los Alamos Chamber of Commerce Business Awards. Thank you for helping us remain a staple in the community!

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UPCOMING EVENTS

Suds and Shows: Wrath of Khan **JULY 14**
Electric Vehicle Show **JULY 16**
Bear Festival **AUGUST 27**

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