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PAJARITO ENVIRONMENTAL EDUCATION CENTER, LOS ALAMOS, NM

Preserving Dark Skies for Los Alamos

By Galen Gisler

Los Alamos County has a new, modern, and night-sky-friendly lighting ordinance, and this is good news for us as a community and for the wildlife that shares our space on the Pajarito Plateau.

Preserving dark skies is not just about cultural values, star-gazing, or astronomy. Overlighting the night is known to be detrimental both to human health and to the wildlife that surrounds us. The natural cycles of day and night are used by animals for migration, mating, pollination, feeding, and more. Artificial light disrupts those natural cycles, contributing to population reductions in many species and even extinctions. As humans, we have our own circadian rhythms: our cycle is reset by the bright light of a new day, and darkness invites us to sleep, refreshing our bodies and minds. Bright lighting at night causes a decrease in melatonin production, resulting in sleeplessness and lowered immune response.

Light pollution worldwide is increasing dramatically, according to an article in the January 20th, 2023 issue of *Science* magazine. The authors analyzed tens of thousands of observations by citizen scientists worldwide and found a 10% yearly increase in the sky background caused by artificial light between 2011 and 2022. The first generations of LED lamps were installed as energy- and cost-saving measures by many municipalities as replacements for older lighting

technology. However, those early LEDs, and most still on the market, are strong emitters of blue light, which is much more damaging to the health of humans and wildlife than warmer colors. Even when such lamps are well-shielded, they contribute greatly to skyglow and light pollution. Fortunately, new LED lamps have become available in warm colors, with correlated color temperatures as low as 2000 K, comparable to the familiar color of the high-pressure sodium lamps that have long been used on city streetlights.

Safety and security are frequently invoked as a justification for lighting that is too bright. But bright and poorly directed lighting causes safety and security problems as well. The human eye's ability to see in the dark is limited by the brightest light in the visual field: when lights are too bright, objects or persons in shadows are invisible. Glare also renders things invisible and is a frequent cause of pedestrian fatalities on city streets.

We need outdoor lighting for our nighttime activities. No one is advocating that we eliminate all artificial light at night. The Illumination Engineering Society and the International Dark Sky Association offer basic guidelines for good outdoor lighting: Light should be useful, targeted to where it is needed, no brighter than necessary, controlled so that it does not shine when it is not necessary, and warm in color.

International Dark Sky Week (IDSW) is celebrated this year from April 15th through the 22nd. It is hoped that the Los Alamos County Council will issue an

IDSW proclamation in early April. The Earth Day Festival at Los Alamos Nature Center on April 22nd will have a booth showcasing some of our efforts to preserve the darkness of our beautiful night skies.

The new lighting ordinance that the Los Alamos County Council adopted on December 13th, 2022 (effective as of January 23rd, 2023) embodies the principles of good outdoor lighting. It is part of the County's new Development Code, developed by Dekker/Perich/Sabbatini with assistance on lighting from Clanton & Associates and input from many of our citizens. The new ordinance has net site lumen limits commensurate with those in recognized Dark Sky Communities, sets an upper limit of 2700 K for correlated color temperature for all commercial and street lighting, and requires the dimming of commercial lights after business hours. It applies to all new developments and to significant changes on existing developments, and requires that all commercial and county lighting come into conformance within ten years. Residential lighting is encouraged but not required to follow the guidelines in the ordinance.

Residents of Los Alamos are encouraged to become familiar with the new outdoor lighting section of the new development code and the principles of good lighting. The full text of the code is available at https://cdn5-hosted.civiclive.com/UserFiles/Servers/Server_6435726/File/Chapter_16_Ordinance_No._02-333.pdf.

The outdoor lighting section begins on page 117. Further information and advice on preserving the night sky can be found on the website of the International Dark-Sky Association, www.darksky.org.

Please join us in celebrating International Dark Sky Week, April 15th through 22nd by enjoying the beauty and serenity of our starry sky. 🌌

Book Review: *Conversations with Birds* by Priyanka Kumar

By Cristina Olds

Birders, environmentalists, and poets: This book is for you. Author Priyanka Kumar takes readers on low-key yet dramatic adventures in search of birds of all stripes: tanagers, bulbuls, juncos, owls, cranes, and so many more are featured in this lovely collection of essays.

Kumar grew up in northern India, a source of deep

connection to family, ritual, and landscapes throughout the 274-page book. She awakens to the bird world and to an accelerated attention to her natural surroundings (when she can find them) while in California in her twenties. She also discovers a sense of herself in connection to the wild world, almost meditatively. "In birding, there is a forgetting, a coming out of oneself, while paradoxically also a going deeper into oneself."

As Kumar's writing and film career matured and her family grew from two to four, she moved to Santa Fe, and New Mexico became her playground. While driving their modest Honda in a blizzard in Taos canyon or accidentally down a defunct boat ramp at Elephant Butte Lake searching for wintering bald eagles, her young daughters provided comic relief with dropped backseat scones and a fascination with the lazy roadside cows. Everyone was game to spend the day cruising from one remote wildlife refuge to another, following vague bird tips from forest rangers and waitresses about nesting curlews at mile marker 19.

Kumar delivers a fervent environmentalist message with every essay, urging readers to care about preserving the vital habitats of birds and all creatures, or else. Although she says she "mustn't begrudge the birds the seeds," she very much condemns the US Forest Service—especially for timber sale cutting, the agriculture industry and their pesticides—and hunters, especially recreational shooters and those aiming for top of the food chain predators.

The essays are peppered with facts about place: New Mexico has the lowest water-to-land ratio of all 50 states, and facts about birds: goshawks claim a 700-acre area as the "mountain lion of birds." The author tells entertaining stories of birdwatching and wildlife encounters while tapping into the spirituality of nature and why it all matters in the big picture.

"One Los Alamos" is a local group promoting thoughtful, civil dialogue around our diversity of backgrounds, beliefs, and identities in order to champion shared values and interests that can strengthen our community. Heidi Rogers created the Women of Color Book Club in

“Water, Water Everywhere, nor any Drop to Drink...”

By Marilyn Lisowski

Everyone knows those famous words from “The Rhyme of the Ancient Mariner” by Samuel Taylor Coleridge, a poem about being lost at sea with no fresh water. Water is about 60% of your body! Drink a little more, 64%. Drink a little less, 56%. You cannot survive without water, as that ancient mariner discovered.

Centuries ago, in rivers, streams, and lakes, we had plenty of drinking water on our planet. Not anymore. Our population has ballooned in numbers, and high water-usage industries have flourished. Fully 70% of the earth is covered by water, but only 2.5% of that water is fresh and even less is available to you. How about animals, plants, and trees? They need fresh water too, and there are more of them.

Los Alamos gets all of its water from wells. Those wells punch straight down into an aquifer. An aquifer is not an underground lake, but sediment, sand, and porous rock saturated with water. The water is filtered and purified by this sediment. Our aquifer ranges from 600-1200 feet down and ends at the Rio Grande. As we draw this down, it takes centuries to refill. If we use it up, what then? Shouldn't we conserve it? Yes! There is much you can do to conserve our valuable water.

Our bathrooms are major criminals! But we can help.

Let's take a water conservation shower: turn on your low-flow shower head and collect in a bucket the cold water that comes out before it warms up. Remove the bucket. Then get wet. Turn off the shower and soap down, then shampoo your hair. Turn the shower back on just long enough to rinse the soap off. You're now clean, and you have a bucket of fresh cold water for cooking and watering the indoor plants or the garden outside.

Older toilets use about five gallons of water per flush. You can save over three gallons per flush by replacing old toilets with low-flow toilets. Keep toilets in good repair, and don't allow them to run

constantly or leak. Don't flush after every use. If it's yellow, let it mellow. If it's brown, flush it down.

Let's brush our teeth: wet the toothbrush and turn off the water. Apply toothpaste. Brush your teeth. Turn on the water to fill a small cup and rinse your mouth and the brush. You can wash your hands the same way, and they will be just as clean as running water constantly over them.

Use a water-saving washing machine, and wash clothes only when there is a full load. If hand washing dishes, fill the sink half full of soapy water, stack the clean dishes, and spray rinse them.

Save cooking water! Let it cool and water the plants with it.

Lawns are accessories to crime! Replace your lawn with stones or native plants that do not need that much water. Water every other day using timed drip irrigation, not sprinklers. Mulch your gardens and flower beds to hold moisture in. Cover the earth with black plastic around plants and over your drip and soaker hoses.

Don't wash your car as often. When you do, make sure the hose has a shut-off attachment.

What if a fictional family of four employed all these methods and used about 4,000 gallons of water per month instead of the national average of 12,000? The 8,000 gallons of water saved monthly would be 96,000 gallons per year. At the water rates in Los Alamos, that is a savings of about \$712.32 per year.

Australians, especially in the outback, are water-wise! They use all their gray water, except for the toilet, at least twice. Gray water from warm showers and washing dishes goes into the washing machine, then out into storage for gardens. They collect rainwater by putting barrels under each downspout. They use that water for all household purposes. See if you can cut down to three gallons per day each. That's 360 gallons per month per family of four. If the nation did this, we could fill Lake Erie with the water saved!

Think about your water as more valuable than gold—because it is. You cannot live without it. Don't let the water run for no reason because when it's gone from our aquifer, it's really gone, and we cannot get it back. 🌱

How Mountain Lions Feed the Forest

By Taylor Solorzano

Mountain lions (scientific name *Puma concolor*) are solitary members of the feline family, active from dusk to dawn, with a lifespan of eight to thirteen years. They are found from sea level up to 10,000 ft. If you live in the mountains, foothills that back up to them, or perhaps somewhere just a bit more remote, you may have glimpsed a mountain lion in your yard, or crossing the street, in the dark of night. These mysterious felines give people pause for good reason, garnering both fear and wonder alike, but do you know the role mountain lions play in the ecosystems they reign over?

Mountain lions are tertiary consumers, organisms that obtain energy by consuming other consumers at different trophic (nutritional level) levels of the ecological pyramid or food web. To put that into context, their diet primarily consists of ungulates, like deer and elk; however, they've been known to hunt small game too, from coyotes and fox to rabbits and porcupines to even bobcats and skunks. Mountain lions make kills roughly once a week, only returning to their kill for a few days after, and will not consume the stomach, or rumen, of their prey, often burying it away from their kill, to prevent stomach acids from spoiling their meal before they are done with it. So, if they don't eat all of their kill, what happens to it? Try though they might to keep their kill from spoiling or being discovered, in step the scavengers. Bears, bobcats, ravens, eagles, vultures, skunks, and even songbirds come to these kill sites, hoping to snag a piece; however, scavengers aren't the only ones to profit when mountain lions make a kill.

Organisms at every level of the food web benefit from these kills. First are those that scavenge directly. Then come the detritivores (those that consume decomposing animals) such as worms, maggots, and isopods. Then come the plants that benefit; to the detritivores that consume decomposing animals, such as worms, maggots, and isopods; to plants that benefit from the nutrients cycled back into the soil by detritivores.

This is an example of top-down ecology, in which populations at lower trophic levels, the bottom of the ecological pyramid, are impacted, directly or indirectly,



*A mountain lion spotted in Acid Canyon
Photo Credit: Bob Walker*

by those at the top. By making kills for themselves, mountain lions also feed a variety of organisms at different trophic levels. Mountain lions feed the forest.

That's not all that happens when a mountain lion makes a kill. Mountain lions are opportunistic and will target weak and elderly members of a group. By removing those not fit to survive from the population, the gene pool of the population improves, a direct impact made by mountain lions. This is also part of what makes them a keystone species, a species other species largely depend on, vital to an ecosystem, and if removed, would drastically change how the ecosystem looks. Not only do mountain lions control prey populations, but they also influence the movement of other animals, including other predatory species, like bobcats, coyotes, bears, and scavengers like vultures, too. Where other animals rest, have their offspring, feed, and what areas they feel safe to travel can be a reaction to the proximity and activity of mountain lions.

Mountain lions are a necessary part of a healthy ecosystem, keeping prey populations in check, feeding a variety of other creatures big and small, and helping to return nutrients to the soil, which benefits plants. Thus the herbivores that consume plants, along with the mountain lions that consume the plant-eating deer and elk, complete the chain—and round and round we go. Did you ever imagine those glowing eyes that you glimpsed in the night, that black-tipped tail, was not only a part of but integral to something so much bigger? ⚡

Cute Chipmunks Cheer Me Up!

By Selvi Viswanathan

Los Alamos fauna and flora offer opportunities to enjoy nature right from our backyards.

The canyons with their cliffs, trees, and shrubs are ideal habitats for wildlife. We live in a house located between two canyons. We added built-in benches on our deck to watch the nearby wildlife. Our son Hari built ponds in the 90s to attract birds, and it turns out they also attracted other wildlife without making them a nuisance. The pond in the back borders a canyon, and the cute chipmunks love it.

In October 2021, I saw a pair of chipmunks, which is rare since they are usually solitary. I loved taking pictures of them.



*A pair of cute chipmunks spotted at Selvi's backyard pond.
Photo Credit: Selvi Viswanathan*

I also learned to recognize the different calls the chipmunks used for communicating from the canyon. I noticed the chipmunks at the pond often went to a rock just behind the pond almost at the canyon rim. I wondered if this could be the entrance to a burrow.

The internet came to my rescue, and the most intriguing fact was about their burrows. They build two kinds of burrows. One is shallow for hiding from predators like hawks during the day. This may be what I was seeing at the ponds since hawks also frequent the pond. The second type of burrow is more complex and is where they sleep. Each chipmunk

has its own burrow. The female will mate outside of her burrow and raise her pups alone. She will defend her territory with her loud chips and chucks.

Chipmunks make homes for themselves by creating burrows with an underground tunnel system. The chipmunk will remove a large amount of soil and carry it in its cheek pouches. This camouflages the entrance to den.

Chipmunk burrows are 2-3 inches in diameter. They don't leave mounds of dirt like anthills. Instead, they are flat. The burrow may reach 30 feet long and 3 feet deep. The burrow consists of a series of tunnels of varying widths with several openings, a nesting chamber, a sleeping chamber, a waste chamber, etc. The nesting chamber is centrally located and is lined with crunched-up dry leaves. Narrow tunnels extend downwards in places to draw water away from the burrow.

These agile creatures can run up to 26 mph and are a common sight in our nature center from the observation room.

When I was growing up in India my favorite story was about how a chipmunk got its stripes! My father used to tell me a bedtime story from the epic story *Ramayana*. In the story, Rama's wife Sita was abducted by Ravana, the king of Lanka (Sri Lanka), which is a small island just south of India. To bring Sita back, Rama with his army of monkeys built a bridge to cross the ocean. The monkeys used huge boulders and rocks. A tiny squirrel saw this and wanted to help. It used its bushy tail, got it wet, and rolled it on the sand. It went to the bridge and shook its tail to add sand as mortar. Rama was touched by its devotion and petted its back with his fingers which formed the stripes! This story instills in children that even a small deed is appreciated!

The South Indian classical music composer Thyagaraja mentions the Telugu word "Udatah Bhakthi" (squirrel's devotion), and so chipmunks cheer me up! 🦫



Earth Day Festival 2023



Join us for the Earth Day Festival 2023 at Los Alamos Nature Center!

Mark your calendars for PEEC's signature Earth Day Festival Saturday, April 22nd, from 10 a.m. to 2 p.m. There will be music, booths, crafts, food, friends, and fun! Throughout the day, enjoy a variety of local, regional, and state booths with activities and goods to celebrate Earth Day. The whole family can jam out with Recycle Man on his instruments made from buckets and other recycled materials, and you know what the best part is? This festival is free! I invite you to join us as we celebrate the connections we have with our canyons, mesas, mountains, and skies.

The Earth Day Festival is also a great time to catch up on all your PEEC to-dos. Pick up your free membership gift if you're a contributing level member. Get a new Passport to the Pajarito Plateau, or bring yours in to show us your completed hikes and get your prizes. Visit the PEEC gift shop, which will be bursting with great ideas for all those spring birthdays and holidays—like graduations and Mothers' and Fathers' Days.

We are looking forward to seeing you at the festival! ⚡

- Jillian Rubio
Executive Director, PEEC

The Power of Seeds

By Liz Martineau

If you tried to buy seeds during the 2020 shortage, you know that at that time there was a resurgence in gardening. About this same time, a group of people from different organizations from Los Alamos first began talking about the possibility of a seed library. But, just like growing a garden, new ideas require more than talk.

A collaboration was formed, with PEEC and Los Alamos County Libraries taking significant roles in organizing the group of volunteers. Despite a steep learning curve and some bumps in the road, the group developed a name and a mission: Los Alamos Community Seed Library cultivates a community culture of life-long learning and sharing through seed stewardship. They are guided by three principles: saving, sharing, and learning in an effort to develop an accessible and sustainable source of locally adapted seeds that contribute to local biodiversity.

Along the way, the seed project is supporting a community culture of sharing with friends, neighbors, newcomers, and strangers. Working together we can make our community a place where not only plants but also people can thrive. And that is the power of seeds.

Everyone is welcome to contribute to the Los Alamos Community Seed Library! You may save seeds from your own gardens, donate seeds and envelopes, help package seeds, donate money through the Friends of the Library, and check out seeds.

The Los Alamos Community Seed Library officially opened in late March 2023. Come see for yourself our amazing new seed library inside Mesa Public Library today! 🌱

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

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"Great place to take the family if you are interested in learning about astronomy and natural sciences. The view is spectacular and incorporates the natural environment."

— 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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*Jam out with Recycle Man, sponsored by
Enterprise Bank & Trust, at Earth Day Festival
2023! Photo Credit: Teianna Mitchell*

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UPCOMING EVENTS

Earth Day Festival **APRIL 22**

Seed Swap **MAY 13**

Night Sky in June **JUNE 5**

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