

B O S Q U E



Photo: Stan Shebs

DASYLIRION WHEELERI

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T R A C K S



The winds are blowing in a new season at Rio Grande Nature Center. The warmer weather has prompted the sandhill crane migration north and has triggered new growth in the vegetation at the park. Soon our planting season will begin as we continue our habitat restoration efforts. Thankfully, recent volunteer trainings have helped recruit volunteers to assist us with these efforts. I hope our progress will be on display for the Earth Day celebration in April and the Spring Garden Festival in May.

We are in the process of hiring a new interpretive ranger who will help get our education programs back up to full speed, including the Nature Discovery summer camps. Summer camp will be held throughout the month of June; see p. 4 for more information.

We have exciting new changes to our Visitor Center exhibits. Lindsey Evens and his son completed the fabrication on the “tree cookie” display and park staff is currently developing interpretation for this exhibit. We are also working with Lindsey to update and complete the ground water exhibit. Lastly, the Friends Group is helping us print several new and updated photos in the exhibit area. Thank you again to the Friends for your continued support!

Bill Balassi, 2024-2025 President of the Friends

I have been a volunteer at the Nature Center since 1994. For the past two years, I have had the honor of serving as President of the Friends Board of Directors, my second two-year term as President, with a stint as board Secretary in between. Though I will continue as a volunteer and as a board member, I will be retiring as an officer of the board. Another long-time board officer, Treasurer Jo Fairbanks, who took over a Friends organization mired in debt and guided it to the sound fiscal positioning it enjoys today, is also stepping down as an officer but will remain on the board.

In our places, we welcome two wonderfully capable people: board President Greta Roskom and Treasurer Patti Plagge. Greta coordinates our Spring Garden Festival and Patti has been board Secretary and is a past-President; both have put in many volunteer hours each year. Current board member, Patty Phillips, another active volunteer who coordinates our late-summer festival, will be board Secretary, and Chris Small, who heads up our Restoration Program, will continue to serve as Vice President. Please welcome your talented and dynamic new board officers. Not a current volunteer? Please consider joining our volunteer community.

It has been an immensely rewarding experience to serve as President, and I am deeply grateful for the trust and support I have received from everyone. Together, we have navigated challenges and celebrated successes, always with the shared goal of advancing the mission of the Friends and of the Rio Grande Nature Center State Park. I am confident that our new leadership will continue to build upon the strong foundation we have laid, driving our initiatives forward with passion and dedication. Thank you—all of you.



Bosque Tracks

Published quarterly by the Friends of the Rio Grande Nature Center State Park



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Nature Center hours: Open daily
 Gates 8-4, Building 9-4
 Closed

Thanksgiving, Christmas,
 and New Year's Day

Nature Shop 10-2 (M-Th),
 10-4 (F-M)

Masks encouraged inside buildings,
 social distancing outside

Nature Center Staff

SuperintendentLevi Dean
 Park ManagerDylan Frentzel
 Instructional CoordinatorOpen
 Instructional Coordinator . .Karen Herzenberg
 Park SeasonalChan Dreyer
 Park Seasonal Sivan Gordon-Buxbaum
 Park Technician.....Mark Leyba
 Technician Shannon Campbell

Entrance for Friends' members and those with
 displayed applicable annual permit: Free. Non-
 member day use: \$5/vehicle, \$15/bus, \$50 bus.

Cover:

Spared and striking, *Dasyilirion wheeleri*, commonly called desert spoon or sotol, is an evergreen of the Southwest and northern Mexico with a single, heavy, 16-inch trunk. Weaponized and toothed with 40-inch leaf blades, it may rise to five feet when mature. In spring, the Greek-named “shaggy lily” shoots a majestic stem sixteen feet high to flower. Find a sotol in the Nature Center's Native Plant Garden.

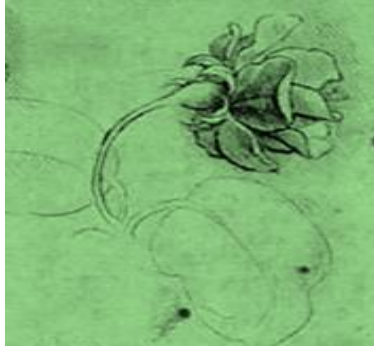


Spring Garden Festival

May 10 – 11, 10 a.m.-3 p.m.



- Guided bird and nature walks
- Herbs and flowering plants for sale
- Booths with arts and crafts
- Face painters and fun for kids
- Wildlife Rescue with live raptors
- Food truck on site



Music Groups:

- Levi Dean and the Mesa Rats
- ABQ Skeleton Crew
- Music for All Seasons
- Jug o' Punch and more

Confirmed Speakers and Educators

- Sarah Jane Cole with Bird Alliance: "How to Prevent Bird Collisions with Windows." *After the talk, Cole will offer a demonstration on making Zen paracord curtains that will hang outside the NC's Education Building.*
- Sara Candelaria with Nature Niños offers a presentation on making ollas from cracked pots.



Festival events are subject to change.



Check rgnc.org for more information closer to the date.

ONGOING IN SPRINGTIME:

-- Storytelling Under the Cottonwood: third Saturday of the month at 10:30 a.m. April 19, May 17, and June 21. ECO storyteller and Master Naturalist Dianne Rossback offers nature stories for kids 5-10 years old with their adult. Meet in the outdoor classroom near the Native Plant Garden.

-- Guided bird walks every Saturday and Sunday at 8:30 a.m.

-- Guided nature walks the second Saturday of the month at 10:30 a.m.

Registration no longer required. Come and join a nature tour!



Make June Nature Discovery Month!

June at the Rio Grande Nature Center launches summer for children with four weeks of discovery in the bosque and on the grounds of our urban state park. From 8:30 to noon Monday to Friday, naturalists will guide young investigators ages 5-10 as they explore the bosque ecosystem. Themed- week activities range from outdoor discovery, arts and crafts creation, and hands-on experiments in natural science.

WEEK ONE (JUNE 2-6): RIVER AND POND LIFE

Dive into the watery world of the Rio Grande and the Nature Center's ponds! Exploring the history of our desert river ecosystem, we'll trace its role in shaping the landscape and the life it supports. We'll review the desert's water cycle, uncovering the delicate balance of life in this arid environment. We'll learn, with nets and microscopes, about macro-invertebrates that live in the water and about larger reptile and mammal swimmers including turtles and muskrats.

WEEK TWO (JUNE 9-13): PLANTS AND FUNGI

Embark on a botanical adventure! Down in the dirt, we'll learn to identify native plants and how to use dichotomous keys while exploring different plant parts and their special functions. We'll discover how plants are vital to local ecosystems and gain appreciation of the natural world around them.

WEEK THREE (JUNE 16-20): BIRDS AND MAMMALS

We'll soar like a bird and track like a mammal this week! As we learn to identify local bird species and begin to understand their anatomy and behavior, we'll see how birds contribute to the bosque ecosystem and the roles they play in nature. Uncovering secrets about the park's mammal residents, we'll spot tracks, scat, and signs, tying them to their owners.

WEEK FOUR (JUNE 23-27): BUGS AND REPTILES

Hop, crawl, and slither into the world of insects and reptiles! We'll learn about insect life cycles, behaviors, and roles in our ecosystem. From pollinators to decomposers, we'll hear how these creatures sustain our bosque environment. Reptiles, too, from lizards to snakes, show us their remarkable adaptations and survival strategies for life in the wild.

#

Cost and further information: For FRGNC members, each week is \$120. For non-members the charge is \$150. See rgnc.org for detailed registration form and program requirements.

How The Day Goes

- 8:30-9: Indoor introduction activity
- 9-10:30: Outdoor exploration with hikes, walks, play and more
- 10:30-10:45: Snack time (provided)
- 10:45-11:45: indoor arts and crafts, microscopes, special presentation, and more
- 11:45-noon: Wrap-up activity and clean up.

Paula Bittner, Nature Shop Manager, thanks the membership for their book donations to the shop.





A small section of Pando in the fall

“Pando” comes from the Latin meaning ‘I spread’; it is an apt name for the aspen stand that now spans 106 acres which is the equivalent of over 80 football fields. Its roots reach up to 30 feet below the ground and it is estimated to be 13 million pounds or the equivalent of 3,250 cars, making it the heaviest known organism on Earth. Aspen stands spread and grow by cloning themselves. In all aspen stands, including Pando, what appear to be separate trees are in fact one colonial organism connected by an extensive root system. When

PANDO:

The Oldest-Living Organism on Earth

By Sadie Hollrah
Biology Department,
University of New Mexico

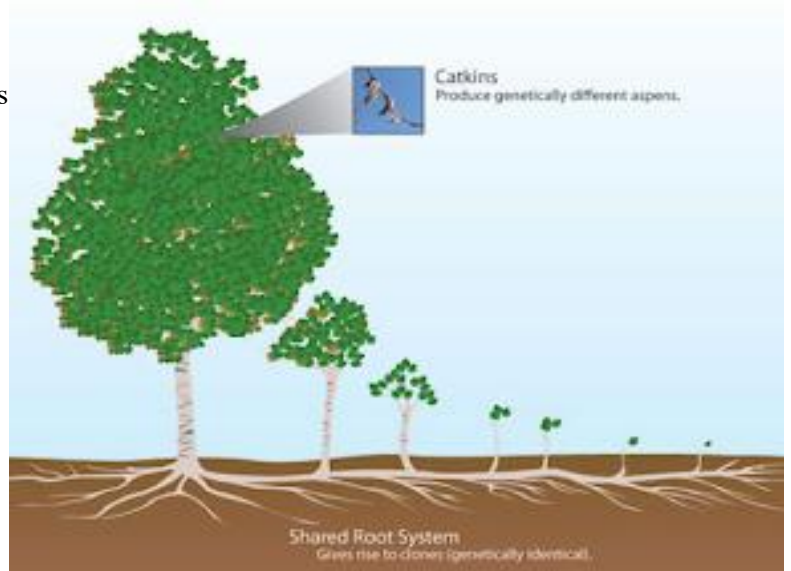
It is thousands of years ago, before the common era. Early humans are just starting to get the hang of their new stone tools and the last of the mammoth and saber-toothed cats roam the Earth. In soil still wet from the melting glaciers of what will one day be called Utah, a single quaking aspen seed germinates. Nourished by warmth and light, its first leaves stretch to the sky and soak up the energy of the sun for the first time at the start of what will be its long life. As far away empires rise and fall over human history, slowly but surely one trunk becomes many. What was once a lonely seed is now a sprawling forest as the organism known as Pando sprawls out across the landscape.

the tree has enough energy, and the conditions are right, it sends growth hormones to the tip of its roots. The emerging root then grows up above the ground to become what is called a sucker. These suckers then mature into what looks like the trunk and branches of a new tree. Pando contains over 40,000 individual stems (trunks). Though these individual stems may grow and die, the root system of the organism survives to clone again. Individual genetically different aspen trees produced from catkins typically live around 130 years,

matching the age of many of Pando's stems. Some estimate that the organism as a whole is estimated to be around 10,000 years old but it is difficult to determine its exact age. With individual stems constantly dying off and being replaced, the method of simply counting the tree rings would not produce an accurate estimate as it would with other species. Instead, researchers look to determining its age using different methods such as habitat modeling (ed.: see box below).

Unfortunately, Pando is now under threat. Researchers have noticed in recent years that Pando's regeneration rate has significantly slowed, meaning that the stems are dying faster than suckers can be cloned. There can be several possible explanations for this behavior. Most prevalently, local human intervention over the last hundred years has created an environment that is no longer as hospitable to Pando. Humans have introduced the non-native common juniper and other invasive plant species to the region and they have taken root in Pando and are draining its resources. In addition, the overgrazing of cattle and white-tailed deer has contributed to the slowing of Pando's regeneration as they eat the newly sprouted suckers. Another factor slowing Pando's regeneration is the lack of fire in the region. Aspens are very fire tolerant and in fact rely on fire to spur regeneration. Since the area that Pando inhabits has been turned into Fishlake National Park, fire has all but disappeared from the landscape.

Researchers and conservationists are leading many efforts to study what is slowing Pando's regeneration and to try to support more growth going forward. About 90 acres of Pando's 106 acres have been fenced off to prevent overgrazing from cattle and deer. Small plots have been sectioned off to conduct



How aspens like Pando clone themselves

prescribed burns, treat for fungus and disease and to remove non-native invasive plants. Some scientists believe that another possible explanation for Pando's slow regeneration is simply its old age. The tree may not have the energy to send up new suckers as well as maintain its expansive size. We may be witnessing Pando's winding down at the end of its incredibly long lifespan.

Since its discovery in 1976, Pando has captured people's imagination. It is incredibly humbling to try to comprehend the life of this organism. Imagine what historic events it has lived through and witnessed, the thousands of creatures that have lived and died under its canopy across hundreds of generations, the cool shade and respite from the hot sun provided for early people settling in the valley. Through wars and social upheaval it has stood still and patient. If it could, one wonders what advice it would give us now.



From *Mosaic of Somatic Mutations in Earth's Oldest living Organism, Pando*. By Rozenn M. Pineau et al.
doi: <https://doi.org/10.110/2024.10.19619233>:

Phylogenetic models estimate the age of the clone to be between 16,000 and 80,000 years. The age is generally corroborated by the near-continuous presence of aspen pollen in a lake sediment record collected from Fishlake, near Pando. (ed.).

The Serviceberry: Abundance and Reciprocity

in the Natural World

by Robin Wall Kimmerer

Reviewed by Bill Balassi

In *The Serviceberry: Abundance and Reciprocity in the Natural World*, Robin Wall Kimmerer observes that Nature gives us everything we need: food, shelter, clothing, even the raw materials that make our industrialized world possible. Typically, we treat these natural products as transactional commodities. We pay money, and in return we get our

groceries, our homes, our iPhones.

Our relationship with the providers of these commodities (or with surrogate salespeople) typically ends with the transaction. But what if we were to consider what we get from Nature not as commodities, but as gifts from the Earth that deserve our gratitude and oblige us, in return, to respect and nurture what we have been given? How

might that transform our relationship with the natural world and, by extension, with one another?

Kimmerer, a biologist and a member of the Potawatomi tribe, incorporates scientific and Indigenous world views, an approach she refers to as “two-eyed seeing” that integrates Traditional Ecological Knowledge (TEK) with scientific ecology; she used this approach effectively in her previous (and highly recommended) book, *Braiding Sweetgrass*. In *The Serviceberry*, Kimmerer applies “two-eyed seeing” to contrast our commodity-based economy with the Indigenous gift-based economy. Despite the effort of European settlers, who used their presumed moral and cultural superiority to try to eradicate Indigenous culture, Indigenous values have survived. Today, they are needed more than ever as we face “the threat of real scarcity on the horizon . . . brought to us by unbridled capitalism” (p. 85).

Kimmerer’s short treatise—barely 100 pages—begins and ends with the same scene on the same day: feasting on serviceberries in her neighbors’ yard. The opening scene centers on appreciating the berries as a gift: “This abundance feels like a pure gift from the land. I have not earned, paid for, nor labored for them. . . . And yet here they are” (p. 2). She feels a special kinship with the “more-than-human” serviceberry bush and the bounty-sharing birds, but this gift—indeed any gift—requires reciprocity (hence, the subtitle, “Abundance and Reciprocity in the Natural World”).

In this case, reciprocity will take the form of serviceberry pies that she will share with neighbors.

A gift-based economy assumes Nature is abundant, capable of meeting all our needs, whereas a market-based economy assumes Nature is scarce and resources are limited. These profoundly different world views result in

dramatically different understanding of what it is to be human and how we interact with Nature: abundance versus scarcity, sharing versus hoarding, community versus individualism.

Community helps gift-based cultures through times of genuine scarcity and famine. All must share the burden equally. Taking more than one’s

share not only harms the entire community but also can transform the hoarder into the feared Wendigo, a cannibalistic monster who represents the dangers of greed and isolation from the community.

As we face the ecological Wendigo that our market-based economy has produced, community is key. Our challenge is to be able to forego our culture of consumption in favor of a culture of gratitude in which “enoughness” replaces the unsustainable requirement of capitalism: continual economic growth. Gratitude is also key, starting with the unearned gifts we’ve been given: the energy of the Sun, the twin miracles of photosynthesis and respiration, the beauty and complexity of billions of years of bacteria, fungus, plant, insect, and animal evolution. All of this has been freely given to us latecomers. The question Kimmerer asks is “How will we answer?” (p.105).

In the final chapter, Kammerer provides a possible answer. She returns to the scene of picking serviceberries with which she began, but now she now lets us know that her neighbors own a farm and have invited other neighbors to enjoy for free the first-year bounty of the relatively unknown serviceberries. Inviting them to pluck the berries for free not only fosters community but also introduces them to a new taste that they might be willing to pay for next year. As her neighbor explains, “An investment in community always comes back to you in some way. Maybe people who



Istock photo



Bats with inborn White-Nose Immunity?

A number of bat species in a small area of British Columbia have demonstrated a remarkable characteristic. Concentrated in different ecological niches, the bats show no sign of the invasive, deadly, cold-loving infection that has decimated hibernating bats in North America. Investigators at McMaster University have zeroed in on a likely explanation: a community of micro-organisms on bat wings, thought to be vital to bat survival and reproduction.

Testing 76 bats, the team identified thousands of bacteria and fungi on the wings, isolating a dozen which appear to fend off the White Nose Syndrome fungus. Further testing of four strains identified bacteria that were more effective against the fungus when combined. Within the past three years, roosts in the BC area and in Washington state have received the powerful probiotic combination cocktail with promising results. The researchers believe that the results suggest region-specific probiotic cocktails to manipulate the group of micro-organisms to help save the bats. McMaster University, October 23, 2024

Snake-Skin Comforters

Researchers at Cornell University have found that cavity-nesting birds are more likely to line their nests with shed snake skins than birds that build open-cup nests. Although this habit has long been observed in these cavity nesters, the Cornell study is the first to compare their skin use with possible cup nester use. Predators of birds that build cavity nests include small mammals, favorite prey of snakes; it's likely that a long history of bad contacts between small-sized bird predators attacked by snakes evolved into a deep, instinctive fear, discouraging any contact with the reptiles. Some birds have responded with the snake-skin defense, aiding survival of their eggs.



During a two-week period, a group of nest boxes simulating cavity nests, stocked with quail eggs and snake skins were compared with eggs in open cup nests. Predators, including squirrels, regularly avoided the snake-skin boxes giving those nests a higher chance of survival. The skin-free nests, visited by a wider range of predators, received less protection.

Earth.com: News

Sounding Off



Seven Orders of insects can hear the echolocation signals sent by bats chasing them. Typically, they escape their predators by taking evasive action. Tiger beetles have a different plan: they send out high-frequency signals of their own. But that should make the beetles more conspicuous to their hunters. Why do they do that?

Scientists for the Florida Museum of Natural History collected 19 different tiger beetle species, some diurnal and others, nocturnal. First, the scientists proved that the nocturnal beetles were palatable prey for bats, readily eaten by them. Sounds made by this group were definitely not an honest warning of toxicity. These beetle nightfliers, they found, had a subterfuge: they emitted their own sounds from hindwings, a signal that closely matched that of a tiger moth that warns bats of its toxicity and nastiness. It's a "dishonest" tactic for the tiger beetle group but also salvation for them. *Natural History* 9/24

Come On In!

Flowering plants have exploded into a huge diversity of some 300,000 different species today, largely due to their coevolution with pollinators. Insects have a huge buffet with many possibilities available to them. Plants need an advantage for reproductive success.



Scientists at the Botanical Institute of Barcelona and others have zeroed in on thermogenesis, or the ability to generate internal body heat as an important pollinating attractant seen in cycads and in some flowering plants. Plants appear to use their heating ability to warm structures crucial for reproduction. Flower warmth, they note, allows an insect to reduce its own expenditure of energy to keep warm, extending feeding time and allowing transportation of more pollen to plant after plant. Heat can help a plant stay viable longer in cold climates, aiding dispersal of volatile chemicals, such as fragrances, to entice pollinators in to feed.

"Thermogenesis could have been a crucial factor in the evolutionary success of seed plants in general, and in flowering plants in particular, as well as in their pollinators," noted the study's lead botanist. *Natural History* 12/14-1/25

Continued from p. 7

come for serviceberries come back for sunflowers and then for blueberries. Sure, it's a gift, but it's also good marketing. The gift builds relationships." Relationships build communities that can help us through tough times, and communities foster joy. As Kammerer says near the end of the book, "I've long believed that the ones who have more joy win" (p. 103). In the face of imminent ecological catastrophe, we need to revise our relationship with Nature and with one another. In the process, we just might find the gift of joy.

Skills: A Vampire's Empire

--Jean Mason

Durango: Sierra Madre Occidental.

The raven-black of a moonless night conceals the contours of an old ranch building on the edge of a pine-oak forest. Inside, the strong ammonia odor of digested blood envelopes a crowd of native bats nestled lowdown along broken window ledges and from splintered crevices on the sagging walls. Above them, hanging wing-tip tight from the highest and darkest rafters of the roof, roosts a company of 60 three-inch, two-ounce common vampire bats, a few young males and females with pups. Waking up after a long day's sleep, the bats bend and twist their flat leaf-shaped noses, infrared heat detectors already on alert; they tune up electrolocation pulses, anticipating obstacles they'll face flying through the forest night. Their pointed ears rise long and sharp, ready to pick up the faint, low-frequency breath sounds of blooded prey nearby.

Although a night of blood feeding approaches, one female sidles up to another who immediately knows and welcomes her. Grooming and licking of silvery belly fur follow, along with wing brush/lap-licks as the partners trade spa sessions of up to two minutes, some ending with a blood vomit "thank you." As with these non-related female friends, it's a contingency behavior with mothers and pups, kin relatives, foster mothers and orphaned pups, and roost members in need as well. Cooperation through social grooming, built up over many months of a 15-year lifespan, helps cement reciprocity between bats when times get tough. Blood feeding is risky: a bat that fails to get blood will starve in a few days.

Blood Brothers

Desmodus rotundus, or the common vampire bat, is a group-living native American that ranges through both arid and humid grasslands and woodlands in the tropics and subtropics of Mexico, Central America, South America, and on some Caribbean islands. One of just three living vampire bat species, it is related to New World leaf-nosed bats in the family *Phyllostomidae*.

Common vampires often seek out mammalian prey instead of bird blood, preferred by its western vampire neighbors, the white-winged and hairy-legged bats. With a geological range from the Pleistocene 45,000 years ago to recent times, all three species are likely evolved blood-diet descendants of an insect-eating bat ancestor.

Fossils of *D.*

rotundus have been found in Florida and in U.S. states bordering Mexico; the species may be on the way. In recent times, individuals have appeared 170 miles south of the U.S.-Mexican border. A recent article in *Ecography* noted that vampire bats are on the move, heading northward due to climate change and temperature differences between warmest and coldest seasons as bats seek more stable climates. The authors predict that the bats will find viable homes in the U.S. within 27 years.

On Red Alert

Pouring out of a gaping hole that once was the ranch front door, the 60-strong vampire colony flies low to the ground, through field and forest on a hunt that may reach four miles. Each bat flies mouth open and sonar sharp, its nose leaf working as a megaphone; both ears and brain are tuned to sounds sent and echoes received. A hunting bat may prefer to zero in on a

female bovid or horse in estrus rather than a closer male, perhaps detecting its hormones; it will also be able to identify an animal it has targeted before, even a sea lion or a Humboldt penguin in Peru, having memorized and classified its low-pitched breathing sounds at an earlier feed. A vampire will then recall the same sounds on a following visit. These extra smarts in vampire bats may be due to their evolutionary and

fortuitous loss of a gene responsible for degrading a metabolite that disables a byproduct of cholesterol digestion (vampires don't consume cholesterol); without the gene, known to be responsible for advanced memory, learning, and sociability in other animals, the metabolite skyrockets.

A sleeping blood target mentally nailed after identifying the in-and-out rhythm of its breath, the predatory mammal drops to the ground a few feet away from its sleeping prey, then

Photo: Wikipedia commons



executes very unbatlike behavior. Silent, invisible, and on full alert, the bat walks or runs like a bounding bunny on its long thumbs and wrists, its wings folded into action as working propellants. Does its victim wake up? The bat becomes an acrobat, jumping three feet forward, then backward or sideways, easily escaping hooves or swishing tails; this super-active confusion on the ground also works to confuse bat predators like hungry owls and snakes nearby. In the world of bats, a vampire is the only one that can take flight from a standing leap with a full belly of blood. In the world of flight, the harrier jump jets of humans are just ponderous vampire bat imitators.

If all is calm, a bat will jump up and climb backward or sideways to reach a leg, flank or neck. After deploying heat detectors from three pits around its noseleaf to find blood vessels near the skin surface, it will lick the site and nibble away any interfering hairs. Then open wide come the triangular, razor-sharp incisor teeth that take a tiny flap of skin, a painless nick for the victim. Blood flows down to lateral grooves on the tongue's underside; aided by a saliva anticoagulant, it will keep flowing for up to eight hours although the bat will lap its fill in half an hour. It will drink 1.4 times its body weight at each meal, just to get enough nutrients.

Designing a Gut for Meals of Blood

Monarch butterflies are devoted to milkweeds; giant pandas choose bamboo, and black-footed ferrets single out prairie dogs to hunt. Many finicky animals have a backup to their preferred food: monarch caterpillars will chew on tropical dogbane plants and pandas will occasionally hunt rodents. But vampire bats have no alternative. For them, blood is all.

Nearly devoid of carbohydrates, vitamins, fats, and calories, blood is also 80% water. Ninety-three percent of the nutrients it contains are proteins, hard for the kidneys to metabolize. Blood also has high concentrations of iron which can wreak havoc on the digestive track and liver. How do vampire bats survive?

Studies show that vampires have evolved a unique relationship between their genome and gut bacteria which safely lets them sample a wide variety of blood from different sources. Comparing the gut and DNA of *D. rotundus* with those of insect-eating and fruit-eating bats, researchers found 280 types of bacteria that performed many tasks, focused on metabolizing proteins and producing needed vitamins. Their genome, similar to that of other bats, contains a number of so-called "jumping genes," or transposons that can change at multiple positions throughout the DNA in order to aid in metabolism, immune response, and viral defense. Blood often contains endogenous retroviruses which insert copies of their genetic



*After it's mother's death, a foster mother feeds the orphaned pup in Gamboa, Panama.
Smithsonian March 9, 2021*

material into a host's genome; vampire bats have defensive genes that have jumped in to resist them.

Compared to other bat species, vampires have received another boost to survival through DNA it has lost. These include some 13 key genes, their loss a plus for a blood consumer. One gene reduced the vampire's bitter/sweet receptors, making them less receptive to the bad taste of blood. Others changed the shape of a vampire's stomach, transforming it into a big floppy sock that can super-fill with the blood's excess water, which the bat will readily and

continuously pee out. Yet another gene lost by vampires had the job of keeping iron in the bloodstream and out of the intestines. But vampire bats need and want the opposite of that. The intestines have wall cells that are short-lived and easily replaced; bats digest the shed cells, along with their iron, then send it out as poop.

Negatives and Positives

Although humans are occasionally bitten by the bats and infected with rabies, they are not the usual blood object of vampires; less than one percent of vampire bats even have rabies. Those that do, especially in the large populations of South America, cause infections that may be lethal to livestock. Since an infected bat can transmit the virus without displaying symptoms, humans in bat country are warned to seek medical attention when coming in any contact with an animal.

Scientific investigation into the bat's ability to deploy an anticoagulant that keeps blood flowing has led to a glycoprotein drug known as draculin, helping increase blood flow in those who have suffered a stroke. Also, scientists are also intrigued by how vampire bats, exposed to rabies, display immune systems that develop strong antibodies to rabies. Understanding more about this immunity may lead to better treatment of rabies.

Sources:

animaldiversity.org/accounts/Desmodus_rotundus;
britannica.com/print/article/622534; factanimal.com Nov. 5, 2024;
National Geographic Feb. 2, 2018; Ronald M. Nowak and John L. Paradiso. *Walker's Mammals of the World*, 4th ed. 1983;
particle.scitech.org.au; pmc.ncbi.nlm.nih.gov/articles; *New York Times* Nov. 5, 2024; *Science Daily* Nov. 27, 2023; ScienceDirect April 6, 2020; *Scientific American* April 6, 2020; *Smithsonian Magazine* Feb. 23, 2018; Wikipedia: common vampire bat.

Viva Volunteers !

Sum of CY '24 Hours Nov. 1, 2023 – Oct. 31, 2024

Over 400 hours: Patti Plage, Christine Small. *Over 300 hours:* Lindsey Evans, Jo Fairbanks, Polli Gerstle, Patty Phillips, Greta Roskom, and Lou Wilson. *Over 200 hours:* Roberta Favis, Sara Griffith, Katherine Gustafson, Yolanda Homann, Velma Kelly, Graig Marshall, Colleen McKee, Michel Roskom, and Diana Zavits. *Over 100 hours:* Donna Ames, Bill Balassi, Mary Compton, Dianne Dragoo, Ray Harrington, Susan Hunter, Mary Johnson, Susan Kutvirt, Terry LeVois, Patricia Marotta, Paula Mortensen, Deanna Nichols, Cathy Pasterczyk, James Rhodes, Cynthia Schreuers, Doug Shaw, Claude Vallieres, Jan Villescas, and Mary Lou Wilson.

Grand Total: 7,561 Hours

Five-Year Awards:
Lindsey Evans, Roberta Favis,
Katherine Gustafson,
Kate Krauss, Terry LeVois,
Molly Madden,
Judy Muller, Christine Small,
and Lou Wilson.

Velma Kelly
Volunteer of the Year
2024

Ten-Year Awards:
Vicki Dern, Ann King, Ray Harrington,
Carla Panuska, and Mary Lou Wilson.

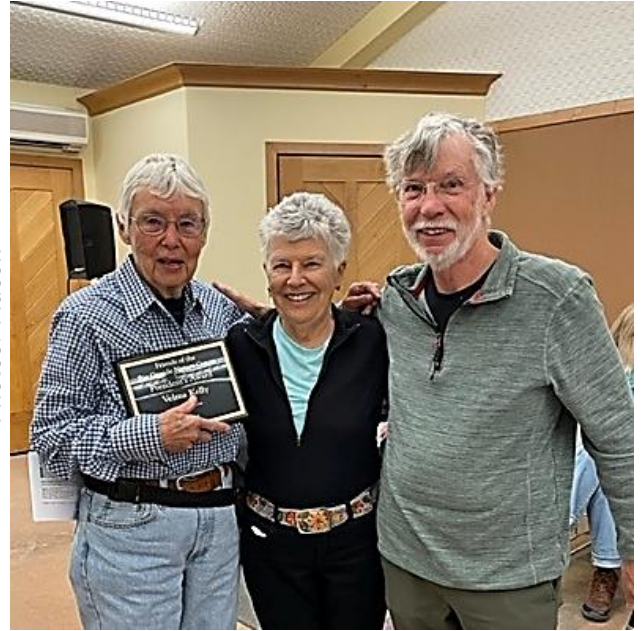
Thirty-Year Award:
Bill Balassi.

The Friends Board of Directors

Front Row: Patty Phillips, Patti Plage, Ruth Salvaggio, Jo Fairbanks, and Bill Balassi.

Back Row: Susan Kutvirt, Greta Roskom, Terri LeVois, Dave Hutton, Christine Small, Colleen McKee, and Lindsay Evans.

Photos: Mason



*With Velma: garden team leader Polli Gerstle
and Friends' President Bill Balassi*



Friends of the Rio Grande Nature Center, Bank Account Summary, February 14, 2024

Checking and Savings

Business checking, Bank of ABQ	\$136,387.01
Business Time Account, Wells Fargo	\$ 97,617.20
Fixed Five-Year CD, Bank of ABQ	\$ 6,734.95
Bank Account Total	\$240,739.16
FRGNC Current Checking Account total:	\$136,387.01

Restricted Accounts

Capital Improvements/Education	\$ 4,153.17
Accounts of Banner, Gibbs, Lumpkin/Sparks, Meloy and Woods	\$50,581.85
Total Park Restricted Balance	\$54,735.02

Total FRGNC Unrestricted Balance: \$81,651.99

Symbionts: Survivor Multipliers

1. Birds and **c**__ (reindeer): birds follow herd and feed on insects stirred up; get protection from deer.
2. **T**__ (spider) and **f**__: Spider protects amphibian which eats ants that take spider eggs.
3. **C**__ fish (Bozo?) and sea **a**_: Venom-proof tomato fish wards off predators, gains protective **h**__ near marine invertebrate, **unh**__ed.
4. Gosh__ and honey **b**__: Mammal digs, flushes out prey for bird.
5. Zebra eat high **g**__, **w**__ (gnu) eat low.
6. Tobacco plant hit by caterp__ sends out chemical for predatory help.
7. **G**__ snakes live near **r**__ burrow; mimic rat smell.
8. Blind shrimp and **g**__: Shrimp digs burrow; fish sees enemy; both retreat.
9. Algae and **s**__: food and cover for **s**__poke mammal.
10. Hoverfly mimics stinger **w**__: Gets protection.
11. **N**__crocodile and **p**__: birds clean meat from open croc mouth.
12. Fast **w**__ (canid) make kill; slow **b**__ drives them off.
13. Remoras attach to **m**__ rays; eat parasites.
14. Wrasse clean tissue from predatory **s**__.
15. Bees and **f**__ plants: get nectar, deliver **p**__to new plant.
16. **C**__ and cattle **e**__ (find 2): Cattle stir up flies for bird.
17. Coyotes **r**__, badgers **d**__: work together.
18. Honeyg__ birds help humans who leave bee **l**__ (young) for birds.
19. **Z**__ and rhino cleaned of **t**__ by **exp**__: birds give alarm threat.
20. **F**__ (pl.) and roots; help plant absorb H₂O; agent gets carbs via photosynthesis.
21. **C**__ flower smells of **m**__: Attracts flies, beetles to spread seed.
22. Blood-sucking **t**__ fly gets essential nutrients from many bacteria.
23. **M**__(apes) settle near wolves; **s**__ (smell) scares off predators.

24. **H**__bills and mongoose: bird gives false alarm, grabs mammal's prey.
25. **C**__ reef critters feed on and **f**__ (cultivate) algae.
26. **C**__ (corvid) and humans: bird **k**__ (identifies) faces, brings gifts; rejects, attacks enemies.
27. **M**__ (plant) is **s**__ (only) food for monarch **e**__ and caterpillars.
28. Cobra venom has **b**__ that kills infections.
29. **O**__ (plant): seed **g**__inates with help of fungus.
30. Some **h**__birds lie on **a**__ (find 4) nests for cleaning.
31. **O**__ (raptors) will nest near deer to avoid predators.
32. **C**__(bivalve) has algae in tissue; gets food, gives carbon.
33. Ants protect **a**__ tree from **i**__.
34. Pitcher plant and **b**__: mammal rests inside, plant gets waste.
35. Whales and **b**__: crustation gets **f**__ (find 2), whale a "suit of **a**__."
36. **W**__, or wild **p**__(find 2), cleaned of ticks by mongoose.
37. Yucca plant's **m**__ is its only pollinator.
38. **T**__ tadpoles and algae: it lives on tad, young get O₂, grow bigger.
39. **A**__fox and caribou: herd digs through snow, helps fox get food.
40. Ants tend **a**__(plant suckers); they get **s**__, called **h**__.
41. Two unrelated **d**__ species (cetaceans) forage, play together.





SUMMER GARDEN FESTIVAL



SATURDAY AND SUNDAY, MAY 10 AND 11

Friends of the Rio Grande Nature Center 2901 Candelaria NW, Albuquerque, NM 87107

Name _____
Address _____
City, State, Zip _____
Contact Telephone # _____ email _____
(Telephone number that you use at home, work, and/or cell)

MEMBERSHIP CATEGORIES (CHECK ONE):
 Regular** \$30 Donor \$50 Sponsor \$100
 Special* \$20 Life Member \$1,000
CIRCLE ONE: *Senior (62+), Teacher, Disabled,
Student (23 & under)
**Individual, Family

DONATION IN ADDITION TO MEMBERSHIP***
Enclosed is a donation of \$ _____
***The Friends of the Rio Grande Nature Center
Is a non-profit 501(c)(3) corporation

I am renewing my membership(s) _____
 I am a new member
 I am registering for a class or program
 I do not need a parking pass
____ Enclosed is my check
____ Please charge my ___ VISA ___ MasterCard
Exp. Date _____ Amount _____
Card Number _____
Signature _____
 Send information about volunteering
 Email *Bosque Tracks* Publication

Office Use Only

Date Received _____ Check # _____
Amount _____ Permit Mailed _____
Permit # _____ Member # _____
Payment Method _____ Sold by _____

From *Symbionts: Survivor Multipliers*, p. 12

- | | | |
|-----------------------|-------------------------|--------------|
| 1. caribou | 19. Zebra, tick, pecker | 36. Warthog, |
| 2. Tarantula, frog | 20. Fungi | pig(s) |
| 3. Clown, anemone, | 21. Corpse, meat | 37. moth |
| homes, harm | 22. tsetse | 38. Toad |
| 4. hawk, badger | 23. Monkey, scent | 39. Arctic |
| 5. grass, wildebeest | 24. Horn | 40. aphids |
| 6. pillar | 25. Coral, farm | sugar, |
| 7. Gopher, rodent | 26. Crow, knows | honey |
| 8. goby, burrow | 27. Milkweed, sole, | 41. dolphin |
| 9. sloth, slow | eggs | |
| 10. wasp | 28. bacteria | |
| 11. Nile, plover | 29. Orchid, germ | |
| 12. wolves, bear | 30. Humming, ant | |
| 13. manta | 31. Owls | |
| 14. shark | 32. Clam | |
| 15. flowering, pollen | 33. acacia, insects | |
| 16. Cows, egrets | 34. bat | |
| 17. run, dig | 35. barnacles, food, | |
| 18. Guide, larvae | armor | |

Guided Weekend Bird and Nature Walks

*Bird walks every Saturday and Sunday
at 8:30 a.m.*

*Nature walks 2nd Saturday of the month
at 10:30 a.m.*

*Pre-registration
not required.*



The mission of the Friends of the Rio Grande Nature Center is to support the Rio Grande Nature Center State Park's mission: To preserve and protect the Rio Grande bosque, educate the public about Rio Grande ecosystems, and foster positive human interactions with those ecosystems.