Greetings, Hola, Yá 'át' ééh

It is another beautiful winter on the southern Colorado Plateau this year. There is nothing quite so striking as snow on the many ancestral Puebloan structures that dot the landscapes of our region. We hope you are staying warm and cozy this season.

-SCPN Staff

On the Postcard:
Aztec Ruins
National Monument
New Mexico

Photos by NPS

The Plateau
Postcard

Southern Colorado Plateau Network: Who We Are

The Southern Colorado Plateau Network (SCPN) is one of 32 National Park Service Inventory and Monitoring Networks across the country established to collect, organize, analyze, and synthesize natural resource data and information about national parks, and provide the results in a variety of formats useful to natural resource managers.

SCPN comprises 19 national park units located throughout the diverse landscapes of northern Arizona, northwestern New Mexico, southwestern Colorado, and southern Utah.

Most importantly, we are a community of individuals who collectively love the Colorado Plateau.

In this issue...

Canyon de Chelly National Monument Photo by J. Yazzie

Happy 2024! We'll Drink a Cup of Kindness Yet...

Chris Calvo's recent interview with Dr. Parmenter (page 4) highlights a few of the many contributions Bob has made to science and NPS. All the best during retirement Bob! Unfortunately, we will lose another valued colleague and friend this month, as Kristen Philbrook (Wildlife Biologist, Regions 6-8) is retiring after 30-years of service (pictured below, center).

Kristen was born in St Paul and spent her youth in southern MN and Erie PA. She then attended Hope College before earning a Master of Science degree from Northern Arizona University. Kristen started her career as a seasonal technician for the Bureau of Land Management and Colorado Parks & Wildlife, before spending 25-years working in the US Forest Service.

Kristen joined NPS in 2018 as a Wildlife Biologist for Regions 6-8, i.e., 85-parks ranging from Montana to the Mexico border. Kristin has worked closely with every unit in SCPN and visited 25 parks, mostly in NM & AZ, during her tenure at NPS. One notable example of Kristen's excellent service was her work with numerous parks to fund priority research while serving on the Emerging Wildlife Disease review panel. When asked, she refused to pick a favorite park, but she did share that Grand Teton was her first. I am truly grateful for the short-time I was able to work with Kristen and wish her all the best in retirement. She's starting things off with a 3-week Caribbean tennis camp followed by skiing!

Best wishes for a safe and productive year, *Matthew*

Plateau Perspectives

We can almost guarantee that you, dear reader, have seen this iconic Plateau location in at least one photograph. But maybe, just maybe, you have never seen it in the snow! Horseshoe Bend at Glen Canyon National Recreation Area photograph by Mariusz Jeglinski.

Bats and White-nose Syndrome

In October, many of us gathered at the Chaco-Aztec Museum & Archives Facility (CHAZ) in Albuquerque, New Mexico to discuss our incredibly diverse bat community and outline a detailed implementation plan for a multi-park bat project recently funded by NPS's Emerging Wildlife Disease Program. Many thanks to Cynthia Wiley (Museum Curator) and Brenna Lissoway (Archivist) for hosting us at the CHAZ and sharing some of their amazing collection!

White-nose syndrome (WNS) is one of the worst wildlife diseases in modern times, having killed millions of bats across North America, and it is spreading quickly to our region ([Where is WNS now?](#)). Upcoming collaborative work by 20-parks will mist net bats to monitor for White-nose Syndrome across the Colorado Plateau and use acoustic monitoring to document bat community composition, distribution, and phenology before or at exposure to the disease.

"Bats have a destiny to fill, and I will bet they fill it better than we do ours." - Josh Billings

It's all about the bats. Pictured above (left to right) Dylan Schneider (PEFO), Priscilla Hare (BAND), Kristen Philbrook (IMRO), Nikki Berkebile (SAPU), Maggie Johnston (Virginia Tech)

Spotted Bat/NPS

Tracking Pinyon-Juniper Vulnerability in SCPN Parks
Can Satellites be Used to Predict Die-off Events?

SCPN is partnering with four parks that have experienced pinyon-juniper die-offs to test whether indications of the mortality events can be identified in remote sensing imagery months or years in advance. We expect vegetation to be stressed well before it dies from an extended drought, and we also hope more rapid-onset mortality events may be presaged by telltale signs of vegetation susceptibility.

While mortality appears as a clear and unmistakable break in an inter-annual record of growth cycles, gradual vegetative decline in these evergreen systems is more subtle and harder to detect. Detection is further complicated by a critical shortcoming of the satellite indices most often used to track vegetation condition. In western conifer ecosystems with sparse canopies, indices are more sensitive to the effects of sun angle and shadowing than to plant photosynthetic capacity (Norris & Walker 2020). The lack of a reliable satellite-based record of plant condition over time means NPS managers have no advance warning about Pinyon-Juniper vulnerability prior to a die-off event.

We hope to change all that.

SCPN's Landscape Ecologist Jodi Norris is partnering with USGS Remote Sensing Scientist Jessica Walker to identify a replacement satellite index to use in pinyon-juniper ecosystems. One of the desired criteria for this new index is sensitivity to vegetation stress that precedes disturbance events such as the die-offs observed in the four test parks. A verified signal of vegetation condition trend will be the basis for estimating plant stress and vulnerability.

grca1pj - NetCam SC IR - Wed Sep 13 2017 11:44:05 MST - UTC-7
Camera Temperature: 56.0
Exposure: 297

CAN YOU SPOT THE DIFFERENCES? These two Phenocam automated photos were taken six years apart (2017 on top and 2023 on the bottom) in Grand Canyon National Parks pinyon-juniper woodlands. Can you count how many trees have died during this period? What else is different? For the answer, see the bottom of the next photograph.

grca1pj - NetCam SC IR - Tue Dec 19 2023 11:14:05 MST - UTC-7
Camera Temperature: 35.5
Exposure: 2118

Answer: Five have died fully, but a few others are showing signs of stress.

If the effort succeeds, NPS managers will be able to view weekly updated vegetation condition maps across our widespread pinyon-juniper ecosystems, with the hope of providing managers with an early warning of areas most susceptible to die-off.

Bob Parmenter - A Remarkable Career, an Invaluable Perspective

When a someone gets to work in a landscape for just one field season, they usually walk away knowing that place like a close friend. Now imagine working 20+ years in an area. Especially one as beautiful and diverse as Valles Caldera National Preserve (VALL) in New Mexico. That's what Chief of Science & Resource Stewardship Bob Parmenter has accomplished. He is retiring soon, but that is not going to stop him from continuing his pursuit of research in this iconic area of the Plateau. We were fortunate enough to interview Bob in the Fall of 2023.

Interview by Christopher Calvo

What is one of your first memories at a national park/monument?

I grew up in northern Virginia, and frequented Shenandoah National Park with my family as a kid in the 1950s and then with high-school friends in the 1960s – lots of hikes and camping trips along the Blue Ridge Parkway and the Appalachian Trail. And living close to Washington D.C., I also visited the NPS sites in the city quite often, especially while hosting out-of-town visitors!
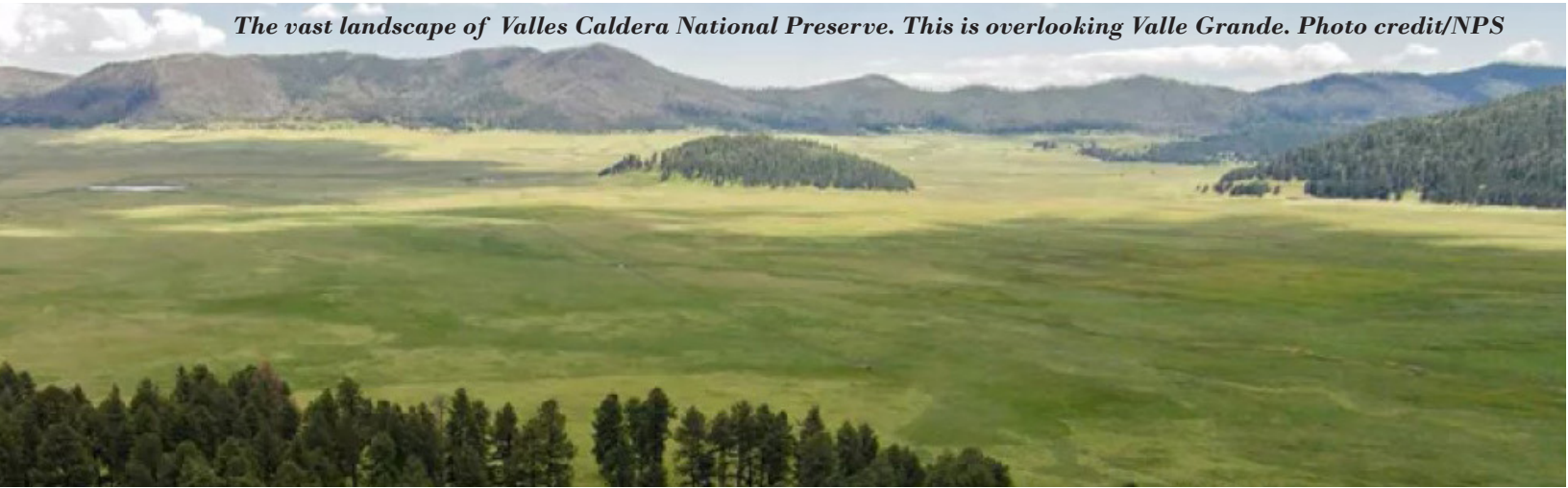
How did you become interested in science, and what motivated you to pursue a career in this field? Who were some of your influences/mentors?

Northern Virginia was very rural in the 50s and 60s – this was before the I-495 Beltway was even built! I spent a lot of time in the woods and creeks near my home, catching frogs and snakes and turtles to keep as pets for a while, and then releasing them to catch more of different species. I used to ride horses through fields that are now inside the Beltway, and of course, are long buried under shopping centers and residential developments. But those childhood experiences put me on the path to learn about Nature and all the species that lived in my neighborhood. My mother was very tolerant of all the creatures I'd bring back to the house – she had been born on an African mission in what was then the Belgian Congo in 1925, so she had lots of pet wildlife when she was a kid – so a kindred spirit in that regard. And all my childhood buddies were similarly inclined to explore the local forests and swamps with me – so it was all a very positive, reinforcing experience to learn about Nature. In high school, I had a biology teacher, Mrs. Abell, who was very dynamic as an instructor, so she provided a great role model for science – a number of us students talked her into teaching an Advanced Biology class our senior year. At Colorado College, Professor Richard Beidleman was my most memorable professor – he was an ecologist/naturalist, and took our classes on extended field trips throughout the Southwest and to many National Park units. At the University of Georgia, for my Masters in Zoology, I worked with Professor Whit Gibbons, a Herpetologist, and Professor Gene Odum, an Ecologist – both excellent ecologists and very entertaining individuals! And then at Utah State University for my Ph.D., Professor Jim MacMahon was my advisor, and he provided a wealth of information on all aspects of ecology – we're still publishing research papers together even now!

The vast landscape of Valles Caldera National Preserve. This is overlooking Valle Grande. Photo credit/NPS

Over your twenty years of work at Valles Caldera, what has been the most memorable or impactful research project or study you've been involved in?

Without question, the event that spawned a massive amount of research, both with NPS staff and outside researchers, was the 2011 Las Conchas Fire, which burned 156,000 acres including ~30,000 acres of the Preserve. We realized that with a warming climate, this fire would not be the last of its kind in the Preserve, so we wanted to understand the ecological impacts and recovery processes. As such, we set about monitoring vegetation, wildlife - both vertebrates and invertebrates, soils, streams, fish, aquatic invertebrates, and so on, with an experimental design that included burned areas and unburned controls, replicated plots, and stratified sampling over different habitat types including mixed-conifer and ponderosa forests, grasslands, wetlands, and riparian zones. Those monitoring sites are still being sampled to get long-term patterns, and we're still working on publishing a number of these data sets.

How has Valles Caldera changed since you first started there in 2003 till now?

When I first arrived here at VALL in spring, 2003, the landscape looked absolutely gorgeous – indeed, it was the "pristine" landscape that convinced Congress to purchase the property in 2000. However, upon closer inspection, there were five areas in need of considerable restoration. First, the forests had been clear-cut mostly during 1963-1972, and had grown back in high-density "dog-hair thickets" of second-growth stands; this had created unbelievably high fuel loads. So, forest restoration, including thinning and burning, was clearly needed. Second, the grassland valles had

been seriously overgrazed by sheep and cattle for perhaps 200 years, with damage to creeks and wetlands. Third, the logging operations in the 20th century had created nearly a thousand miles of logging roads, causing soil erosion problems, and dissecting the landscape – VALL has around 6 miles of road for every square mile of land. Fourth, in support of the livestock grazing, the ranch owners had built 185 cattle stock-tanks, which cut off the hydrologic connectivity of the upland catchments with the lower watersheds. And fifth, the ranchers had built 77 miles of fences, net-wire for sheep, barbed-wire for cattle, partitioning the landscape into dozens of pastures and creating lethal barriers to wildlife movements.

So, the good news is we're almost finished with the forest thinning, having completed ~10,000 acres of forest, including the south-facing slopes of all the unburned areas. Also, our partners, including Los Amigos de Valles Caldera, Rio Grande Return, Rio Puerco Alliance, Keystone Restoration Ecology, and WildEarth Guardians, have finished about 80% of the needed wetland and stream restoration. And finally, all 77 miles of old livestock fencing have been removed. We still need to deal with reclaiming the roads, and removing the stock tanks, but with time, we'll get those done as well.

Have you personally observed any shifts in the behavior or distribution of species in response to environmental changes or human activity?

At my home, I put out bird seed in the winter, and enjoy observing the various species around my house.

Over the years, I've noticed the replacement of mourning doves by white-winged doves (a southern species), presumably associated with climate warming. It reminds me that climate change is happening at a fast enough rate to be observable in real time!

As for human activity, at VALL, we humans have re-introduced three species that had been extirpated recently from their native habitats. In 2007, we put several hundred Rio Grande suckers and Rio Grande chubs into the San Antonio Creek watershed, and they have been thriving ever since. In 2013, we re-introduced the northern leopard frog to the Jemez Mountains, and this species has now dispersed into the major watersheds on VALL and seems to be doing very well.

Bob Parmenter, downloading weather station data from the Valle San Antonio unit.

How has collaboration with other professionals played a role in your work, and what are some key lessons you've learned from interdisciplinary teamwork?

I've always been a team player and working with a broad range of people has certainly helped forge my current approach to scientific applications. I've learned that to have a successful team, I need to recognize early-on the role I'm supposed to play in each project – using a football analogy, sometimes I'm the quarterback calling the play, sometimes I'm the ball carrier, and sometimes I'm in support as a down-field blocker. Each project is different, so being adaptable is important.

How do you see the future of biology/ecology evolving, and what areas of research do you believe will be particularly important in the coming years?

I suspect that ecological responses to climate change will be in the forefront – it's not enough to know how the climate is changing, but what those impacts are on ecosystem structure and functioning. In concert with ecological research, the ability to examine genetic changes and evolutionary processes under a changing climate may start taking an important role. Finally, genetic engineering has a huge potential to impact both human ecology and nature in general.

What role do you think individuals, communities, and governments should play in fostering a more sustainable relationship with the environment?

Given that private industry has been the proximate source of most of the world's current environmental problems, the solutions to fixing these issues and preventing future problems falls on individuals, groups/communities and government as there is no one else. With proper direction, regulation and guidance, private industry can also be the source of solutions – but left unchecked, industry will create more problems than it solves.

What advice would you give to young scientists who are just starting their careers?

Think big and think long-term! Embrace teamwork and colleagues in research projects, and accept constructive criticism to help build stronger ideas, concepts and experimental approaches to problems.

What are your plans after retirement?

I'm doing the paperwork now to become an NPS "Volunteer" and continue working on the science part of my job – continuing data analyses, writing journal articles, doing educational field trips – everything except the administrative functions!

Any words to your VALL family?

It's been a great 20+ years at the Preserve, and I look forward to many more as a volunteer scientist – what a great team with whom to work!

Here is to you, Bob!

Elk gathering in the frosty Valle Grande at Valles Caldera National Preserve. Photo credit/NPS

Becoming Better Scientists After Every Single Hitch

A field biologist collects vegetation data on a tablet. By using tablets we can evaluate the quality of data being collected in near real-time, after returning to the office.

The tool Megan and Cindy developed summarizes data collected when the field crew returns to the office after an 8-day monitoring hitch. It compares duplicate observations made by different crew members at some of our sampling quadrants to detect errors. We hope this near real-time feedback on observer error will increase crew member ownership of the data they collect. Further, crews gain experience interpreting data and figures while using the tool to identify when variation between observers is getting large, and under what conditions. There are also some fun highlights that the tool can identify, for example, if a crew member is a "Super Finder", someone that found a plant no one else did. "That can give you bragging rights if you happen to come out on top during a given hitch." Megan adds.

A hitch is biologist slang for a bout of field work. For our hard-working upland vegetation and soils crew, a typical hitch is eight days long. As scientists we make detailed preparations before heading out on the first hitch of the season, and do our absolute best to collect quality data. But, what if we could do better? Of course, we naturally become more proficient at tasks over time, but what if we could increase our rate of improvement by instantly assessing our work? That is the idea behind a great new technique being used by SCPN Plant Ecologist Megan Swan.

Megan and Data Specialist Cindy Parker developed a tool that focuses on something called observer error. Observer error exists in almost all data sets whether you are measuring, counting, or estimating something. It just happens. Sometimes we overestimate grass cover, or we misidentify a plant, and it's important to catch these things as soon as possible. "I think the idea of observer error, that we don't collect data with 100% accuracy, can be a tough thing to think about as someone whose job it is to collect and interpret data." Megan says. "It's unpleasant to face, but ultimately, knowing as much as you can about the variance between observations can really help inform your interpretation of the data. I went into it with that mindset, and then after a few years I wondered if it could be useful in more of a real-time context to provide feedback to the field crew on how things are going."

"Although it remains to be seen whether this is actually increasing accuracy and reducing variance between observers, I've selfishly really enjoyed looking closely at the data as it comes back from the field, rather than waiting until after the field season when we typically do our QA/QC." says Megan, "It makes me feel more connected to fieldwork. Also, I was surprised at how quickly I got over being shocked and upset about the variance between observers. Every data set anyone collects has observer error; it is better to face it then pretend it doesn't exist!"

When asked what the crew's overall response has been to the tool, Upland Vegetation Crew Field Leader Hannah Andrascik smiled and said "I think they liked it, and it made them a little bit nervous. I think it really does make them feel a greater connection to the data they collect during those long, hot days in the field. But there is definitely a little added accountability there too, knowing everyone will be able to see your data. But then again, who doesn't want to be a super finder?"

If you would like to find out more about this tool, please email Megan_Swan@nps.gov

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"To hear something asks very little of us. To listen places our entire being on notice."
                                        - Terry Tempest Williams

Newsletter designed and created by Christopher Calvo

SCPN 2024 FIELD SCHEDULE

Water Quality

Feb	Mar	Apr	May	Jul	Aug	Sep	Oct	Nov	Dec
BAND/CACH	GLCA	GRCA	BAND/CACH	GRCA	BAND	GLCA/CACH	BAND/GRCA	CACH	GLCA

Aquatic Macroinvertebrates

Apr	Sep	Oct
GRCA	CACH	BAND/GRCA

Groundwater

Feb	May	Aug	Sep	Nov	Dec
CACH/CHCU/ELMO/HUTR/SAPU/WUPA	CHCU/ELMO/HUTR/SAPU/ WACA/WUPA	CHCU/ELMA/SAPU/WUPA	HUTR	CACH/WACA/WUPA	HUTR

Upland Vegetation and Soil

May	Jun	Jul	Aug	Sep	Oct
GLCA	GLCA/ELMA/GRCA	GRCA/MEVE	MEVE/WUPA/WACA	BAND	PEFO

Birds

Apr	May	Jun
WUPA	PEFO/CACH/GRCA	MEVE/BAND/GRCA

AZRU

BAND

CACH

CHCU

ELMA

ELMO

GLCA

GRCA

HUTR

MEVE

NAVA

PEFO

PETR

RABR

SAPU

SUCR

WACA

WUPA

YUHO