

Basin and Range National Monument BioBlitz to Benefit Future Planning Efforts

**Chris Hanefeld, BLM
Nevada, Ely District,
Basin and Range
National Monument**

More than 50 volunteers, and agency and organization representatives in early June fanned out across eastern Nevada's 704,000-acre Basin and Range National Monument to observe and record plants, insects, small mammals, birds, reptiles, and amphibians using the iNaturalist application. So far, 470 observations and 183 species have been recorded.

Monument Manager Alicia Styles said data collected in the BioBlitz will benefit future planning efforts. "It will help to focus inventory and monitoring efforts, refine habitat models, and ensure proper care and management of the plant and animal species listed in the 2015 proclamation," Styles said.

Collaborating with the Bureau of Land Management on the two-day BioBlitz were the U.S. Geological Survey, Nevada Department of Wildlife, and Nevada Division of Natural Heritage. Other participants were the College of Southern Nevada, Conservation Lands Foundation, Friends of Basin and Range, and Eastern Nevada Landscape Coalition, which is working with the BLM and state wildlife agency on a five-year project to



NV Division of Natural Heritage, ENLC and BLM Staff "botanizing" during BARNM BioBlitz

inventory bat species within the monument.

"We're excited to work with the agencies to provide baseline data, including species present in the monument and their temporal use of these public lands. With threats such as habitat loss and white-nose syndrome, these data will help us to better understand and conserve bats in the monument," said Susi Algrim, ENLC Executive Director.

A moment of silence was held on the second day of

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Eastern Nevada Landscape Coalition

Our Mission

The mission of the Eastern Nevada Landscape Coalition is to restore the dynamic, diverse, resilient landscapes of the arid and semi-arid West for present and future generations through education, research, advocacy, partnerships, and the implementation of on-the-ground projects.

Our Vision

We envision a future where the ecosystems of the arid and semi-arid West thrive. Functioning, diverse ecosystems will be the result of restoration achieved and maintained with naturally occurring disturbances such as fire, in combination with other management prescriptions, including traditional uses. The Eastern Nevada Landscape Coalition, a 501(c)(3) non-profit, will be a recognized contributor and leader in this effort for future generations of Americans.

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Your Support of ENLC is Critical to Our Success

Susi Algrim, Executive Director

Thanks to the support of our members, staff, partners, and friends, ENLC has had another successful year protecting the landscapes of the arid and semi-arid West that we call home. ENLC helped to conserve and restore hundreds of thousands of acres of land across Nevada's Great Basin and beyond this last year. ENLC is heading into its 23rd year of working collaboratively to improve the health of the landscapes that benefit us all.

Over the last 22 years, ENLC has grown to become the go-to organization for facilitating on-the-ground restoration, data collection, invasive plant management, monitoring, outreach, and education. We work with government agencies, landowners, conservationists, scientists, and the public to protect and restore our landscape from a science-based perspective. Our organization furthers the advancement of environmental conservation and **that's why your support is much more than a charity; it's an investment in the future of the health of the Great Basin ecoregion and beyond.**

In addition to improving the health of the Great Basin, ENLC also helps our local economy, having employed more than 370 people year-round and seasonally in the last 22 years.

Lastly, I want to inform you that our membership level rates are increasing. We've always done our best to keep membership rates low, so as many people as possible can access our newsletter and contribute to the environmental conservation work ENLC performs throughout the Great Basin. Yet, after seven years since our last membership level rate increase, the increased costs of conducting our work have pushed us to make this difficult decision. Unfortunately, the costs of conducting our daily operations have inflated by nearly a third in the last couple of years, and the price of paper alone jumped five times in a year. The new rates are outlined on the last page of this newsletter.

ENLC is lucky to have a longstanding community of members and friends who've supported the organization for many years, helping us weather economic turbulence and an ever-evolving agency atmosphere. We thank you in advance for your continued support of ENLC. **Please remember your membership is tax deductible. Our tax ID number is: 33-1001664.**

If you have questions or concerns, call our office at (775) 289-7974 during business hours or email admin@envlc.org. Thank you again for your generosity!

Gregory G. Gust Herbarium Donations

We want to thank our generous donors for the dedication of ENLC's herbarium in Gregory Gust's name. Your donations are critical to dedicating the herbarium in Greg's name and ensuring that its curation continues.

Here are the donors to date:

- Mary Merello
- Dominic Gentilcore
- Janel Johnson
- Reese Tietje
- Amy Pool
- Alicia Styles
- Arnold (Jerry) Tiehm
- Shannon Lencioni

Thank you again for your generous donations. If you are interested in donating to the Gregory Gust Herbarium, please contact ENLC's office at admin@envlc.org or by calling 775-289-7974.



Janel Johnson and Reese Tietje created this beautiful Gregory G. Gust's Herbarium Plaque

Calendar of Events

September 28-29	Pinyon Jay Community Scientist Workshop – Ely, NV
October 10	Central/Eastern EDRR Region Meeting – Virtual
October 12	Living with Wildlife Course – Las Vegas, NV
October 14	Ring of Fire Solar Eclipse
November 6	Upper Meadow Valley CWMA Meeting – Ursine, NV Pahranagat Valley CWMA Meeting – Alamo, NV
November 7	Railroad Valley CWMA Meeting – Currant, NV White River Valley CWMA Meeting – Lund, NV
November 8	Spring Valley CWMA Meeting – Yelland Ranch Snake Valley CWMA Meeting – Baker, NV
November 9	Newark/Long Valley CWMA Meeting – Eureka, NV Steptoe Valley CWMA Meeting – Ely, NV
November 16	Southern Nevada CWMA Meeting – TBD
December 18	Deadline for Pre-Registration Prices for ENLC's Winter Weeds and Invasive Species Conference
January 10-11, 2024	Winter Weeds & Invasives Conference (ENLC) – Ely, NV

Shifting Baselines

Bryan Hamilton, Integrated Resource Program Manager

The Midden, Winter 2022, Great Basin National Park

www.nps.gov/grba/learn/news/the-midden-winter-2022-issue.htm

Wait!! What? This wasn't always a forest?

It is easy to see national parks as static and unchanging. But the world is always moving, and slower, gradual changes often go unnoticed. Over time these changes may become accepted as the status quo, the way things have always been. This phenomenon is called shifting baseline syndrome (Soga and Gaston, 2018).

Shifting baseline describes a gradual change in our accepted norms and expectations for the environment across generations. Our tolerance for environmental degradation increases and our expectations for the natural world are lowered. For example, bison are absent from 98% of their historic range. Yet the functional extinction of bison is often viewed as a conservation success story. Five billion passenger pigeons once darkened skies in eastern North America. It's impossible for anyone living today to grasp the spectacle and ecological impact of those

now extinct flocks. While these examples may seem cliché, distant and even overly dramatic, they show how shifting baselines affect our perception and acceptance of the state of the natural world. In truth similar changes are occurring all around us.

One example is in the vast sagebrush ocean of the Great Basin.

More than any other species, sagebrush defines the Great Basin, forming one of the largest intact habitats in the country. Many animals, like sage grouse and pygmy rabbits, are only found in sagebrush. Sagebrush is also important for recreation and agriculture, carpeting beautiful open spaces with lush springtime wildflowers, vast vistas, and deeply dark night skies. But sagebrush is also one of the most threatened ecosystems in North America.

Fire in the Great Basin is as natural as wind, sun, and rain. Ecosystems here evolved under frequent and low severity fires (Chambers, 2008). Sometimes called "good" fires, many were ignited by lightning, others intentionally started by Native Americans, who used fire as a tool to manage their environment. But colonization virtually eliminated fire as a natural process from the Great Basin, when aggressive fire exclusion began in the 1920's. This policy had a slow but dramatic effect on sagebrush plant communities.

Without fire, conifers like pinon pine and juniper outcompete and overtake sagebrush. Singleleaf pinon pine and Utah juniper seeds are carried into sagebrush habitat by birds or small mammals, where they establish under a "nurse plant." Nurse plants provide a cool, moist microclimate, with fertile soil for young trees. Over time these trees "overtop" their sagebrush host, out competing it for critical

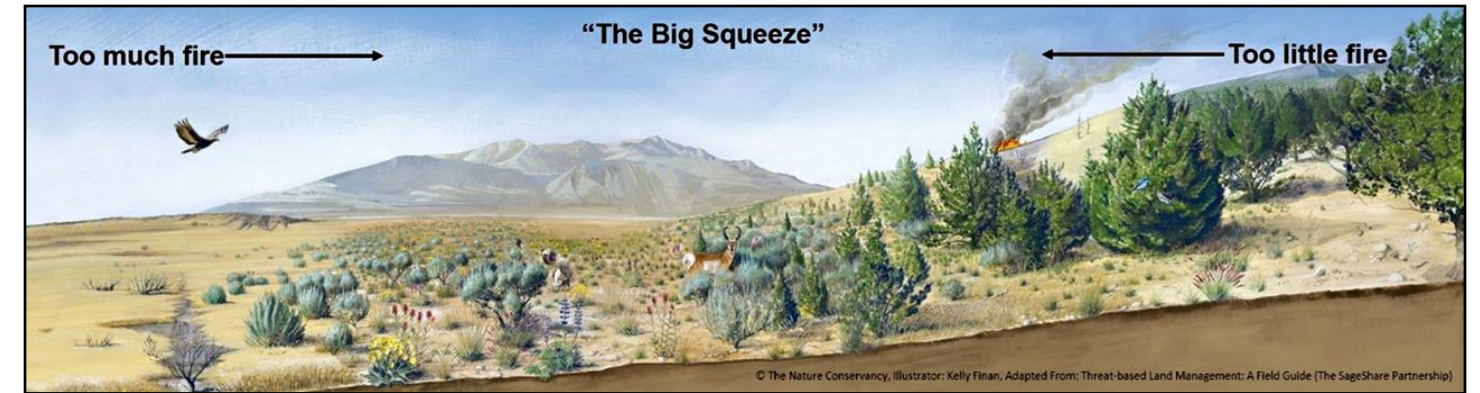
resources of light and water. Fires historically reset this process every 25-100 years (Knick et al., 2005). In the era of fire exclusion, pinyon juniper woodlands have increased ten fold (Miller and Tausch, 2001), fragmenting the sagebrush ocean into lakes, ponds, and puddles (Welch, 2005).

How can we be so certain a site wasn't always a pinon juniper forest? Or that the site hasn't reached its natural, stable, climax community like forests in the eastern US? The evidence of this fire driven process is all around us, starting with the very ground we stand on.

Soil formation is not only a geologic process, but a direct reflection of the plants that formed the soils over thousands of years. Based on soil composition, we know that in some forested areas, trees that are present

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© The Nature Conservancy. Illustrator: Kelly Finan, Adapted from: *Threat-based land Management: A Field Guide* (The SageShare Partnership)

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today were not a significant contributor to the creation of those soils. Instead, soil was formed by sagebrush and grasses, not the acidic needles of a conifer forest.

Dendrochronology provides more strong evidence. Pinon and juniper trees can live extraordinarily long lives. The oldest recorded Utah juniper lived nearly 2,000 years; the oldest single needle pinon pine 900 years (Weisberg and Ko, 2012). If the increase in trees is due to fire exclusion, we would expect relatively young trees in former sagebrush habitat. Indeed, almost all trees are less than 100 years old, aligning well with the beginning of colonization and the fire exclusion era. Ancient pinons and junipers are often found in pockets within or adjacent to sagebrush habitat, but these stands are scattered and limited to rocky slopes with thin soils, areas protected from fires. Old growth trees on these sites show regular fire scars, further documentation of the frequency of low intensity fires of the past.

Historic documents and photographs offer still more evidence. Journal entries, place names, wildlife observations, and livestock stocking records indicate a more open, relatively treeless Great Basin as compared to today. Historic photos further corroborate the increase in pinon and juniper and subsequent decrease in sagebrush and grasslands.

Over time, we have forgotten about "good fire" and the historic, open sagebrush landscapes it maintained. We've come to view widespread pinyon juniper forests as a permanent part of our environment. But these young forests have major effects on plants and animals. Wildlife, like sage grouse, pygmy rabbits, and yellow-bellied marmots need open sagebrush habitat to survive. Other species like mule deer and migratory birds have declined due to conifer encroachment. Less

water is available in streams and springs and there is less native grass and more barren soil. The land is less productive and less diverse.

Fire seemed like the obvious solution to restore sagebrush. But fire itself now presents a challenge. In pinyon juniper forests, dense flammable fuels create catastrophic fires that are hard to control and can damage soils. Following these fires, cheatgrass, an invasive annual, can take over. Cheatgrass is now found on over 17 million acres in the Great Basin and has a negative effect on biodiversity and ecosystem services. Rather than using fire, chainsaws or masticators are used to remove conifers. Sagebrush and other native species, like bluebunch wheatgrass or penstemon, are often seeded on restoration sites after conifer removal. Our success in restoring sagebrush varies but is often better in places with deeper soils, native plants in the understory, and higher precipitation. In addition to restoring sagebrush, conifer removal treatments are designed to recover quickly after wildfires and to resist invasion by cheatgrass. Maintaining sagebrush may require regular maintenance to remove young conifers before they can establish. Restoration projects are carefully monitored to ensure project goals are met.

The sagebrush ocean is the Great Basin. But this vast, beautiful landscape is threatened. Fire exclusion and conifer encroachment have slowly changed sagebrush habitats, leaving these areas vulnerable to catastrophic wildfires and invasion by cheatgrass. As our baselines shift, we may come to see pinyon juniper forests as a fixture, rather than seeing the sagebrush habitat that the conifers have replaced. But active restoration through conifer removal can restore the sagebrush ocean and the wildlife that depend on it.

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Treatment of Baker Lake to Restore Bonneville Cutthroat Trout

Joseph Danielson, Biological Science Technician
The Midden, Winter 2021, Great Basin National Park

In August and September of 2021, Great Basin National Park resource management staff collaborated with the Nevada Department of Wildlife (NDOW) to conduct a rotenone treatment in Baker Lake to remove the non-native Brook Trout and Lahontan Cutthroat Trout (LCT) that were introduced decades ago. The treatment was conducted as part of a larger initiative for the conservation of Bonneville Cutthroat Trout in their native range by establishing new conservation populations in Johnson and Baker Lakes. If successful, this project may increase the species resilience against the impacts of global climate change.

This year's project started in the early summer with snorkel surveys in Baker Lake for LCT spawning behavior. Cold water and high elevation make using dry suits for extended periods of time challenging. Nevertheless, Park staff made several excursions to the lake and observed instances of aggression, signs of fighting, and redd (nest) building, all of which are indicators of spawning.

Observing established redds or redd building was a primary goal during these spawning surveys because cutthroat trout typically bury their eggs in redds in cold, flowing streams, not in lakes. We think that since LCT have found a way to spawn in a lake with no flowing water then Bonneville Cutthroat Trout should find spawning success as well.

The water level at Baker Lake varies throughout the year with the highest lake volume occurring in the spring following snow melt and the lowest levels in the late summer and fall, depending on seasonal precipitation and the persistence of the previous year's snowpack. Calculating Baker Lake's volume at the time of the treatment was a necessary step to determine the amount of piscicide needed to effectively treat the lake.



The Backcountry Horsemen of Nevada - High Desert Chapter were instrumental in helping get gear to and from Baker Lake. Photo by Joseph Danielson, NPS.

One week before the treatment, Park staff conducted bathymetric surveys of the three distinct water bodies that make up Baker Lake. During these surveys, staff made a 5-meter grid of the lake and then accurately measured the depth of the lake to determine the lake's total volume and the volume of water in each distinct section of the lake. This allowed staff to apply a consistent concentration of rotenone throughout all sections of the lake.

During the same week, 25 Brook Trout and LCT were collected via angling to perform a bioassay. The fish were placed in buckets of water with graduated levels of rotenone mixed from 0 to 2 parts per million of product. The fish were monitored for eight hours, and observations were recorded at set time intervals to see how they reacted to varying levels of rotenone. This told us what the minimum effective concentration of rotenone was, the total amount of rotenone needed to treat the lake, and gave us a baseline to determine how much rotenone was still in the lake water after the treatment.

Once this preliminary work was completed, the Backcountry Horsemen of Nevada - High Desert Chapter volunteered horses, mules, and personnel to

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Baker Lake

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haul hundreds of pounds of gear up to Baker Lake before the treatment and back down afterwards. Without their help it would have taken many days and people to hike everything needed to the lake.

On September 1, 2021 Park and NDOW staff began the multifaceted rotenone treatment. The lake's low water level and talus substrate meant that there was a large amount of interstitial water that would not be reached by diffusion of rotenone from the main body of the lake. This area was treated first on foot with pump sprayers. To treat the main body of the lake, we used an inflatable Zodiac boat with a trolling motor to distribute rotenone evenly throughout the lake.

Following the treatment, we surveyed for fish carcasses and counted 301 fish. These fish, along with the 25 used during the bioassay bring the total to 326, but there were likely more fish that were missed during counts. Approximately 13% of fish observed were LCT.

BARNM BioBlitz

Continued from page one

the BioBlitz in memory of Gregory (Greg) Gust who passed away in March 2023. An ENLC botanist, Greg worked extensively on a botanical inventory of the area. "His contributions to eastern Nevada ecology and the bright light he brought to this world live on in our memories," Algrim said.

This year's BioBlitz was the monument's second. Its first BioBlitz was conducted in 2021. The monument was designated in 2015 by Presidential proclamation under the Antiquities Act due to its geological, ecological, cultural, historical, paleoecological, seismological, archaeological, and paleoclimatological significance.

The BLM manages more than 245 million acres of public land located primarily in 12 western states, including Alaska, on behalf of the American people. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. Our mission is to sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations.

Although rotenone decays rapidly in the environment and a low concentration was used during the treatment, we returned the following week to monitor the rotenone level in the lake. To check rotenone levels, Park staff hiked Baker Lake water four miles down to the nearest fish in Baker Creek to conduct bioassays. Fish tested during these follow-up bioassays exhibited signs that corresponded to non-lethal levels of rotenone, which indicated that the rotenone was breaking down as expected.

Rotenone does not affect fish eggs, and because Brook Trout and LCT spawn at different times of year, it is possible that eggs could have been fertilized and buried before the treatment. Park staff will conduct validation surveys in 2022 with gill nets and minnow traps to look for surviving fish. Another rotenone treatment will be done in 2022 due to the possibility of fertilized eggs hatching after the 2021 treatment. Bonneville Cutthroat Trout are scheduled for release into Baker Lake in 2023.

Shifting Baselines

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ENLC's Membership Program is Changing

As we had mentioned in the previous article "Your Support of ENLC is Critical to our Success," our membership program is undergoing some changes, due to the increased costs of conducting our work throughout the Great Basin.

However, we have some exciting changes coming to our membership program. Instead of having the same membership sticker year after year, we have decided to mix it up a little bit. This year we are rolling out our first-ever project themed annual membership stickers. For ENLC's 2024 members, we will be giving out a cool sticker that highlights a wildlife species in which ENLC is collecting data. We don't want to spoil the surprise, so be sure and sign up to be an ENLC member and

supporter to find out this year's theme.

Each year moving forward, our membership sticker theme will change, based on projects that we are conducting throughout the Great Basin.

In addition to our new membership stickers, ENLC is rolling out new "swag" that you can purchase at any of our events, in our office and online at www.envlc.org.

Thank you for supporting the Eastern Nevada Landscape Coalition and remember **your support is much more than a charity; it's an investment in the future of the health of the Great Basin ecoregion and beyond.** Thank you again for your generosity!

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