Newsletter

The Oasis

Spring 2020

In this issue

The Oasis newsletter is published twice a year for Mojave Desert Network park staff and anyone else interested in resource management in the Mojave Desert Network parks. To subscribe, Email: linda_mutch@nps.gov.

Mojave Desert Network
Inventory & Monitoring

Mojave Desert Network bat crew sets up a mist net near Willow Hole, Joshua Tree National Park. Captured bats were swabbed for white nose syndrome testing. NPS / Joseph Ladd

Network Starts Pilot Bat Monitoring Project

As the media has reported in recent years, bat populations have been taking a hit across North America. White-Nose Syndrome (WNS), a disease caused by a cold-loving fungus that grows on bats while they hibernate, has decimated some species populations in the East and Midwest and has now spread to the Pacific Northwest. Bats were known to periodically wake up from hibernation (or torpor) with no ill effects on their precious fat reserves. However, once the fungus starts growing on their faces, wings, and other exposed areas of their bodies, they wake up to groom it off at more regular intervals. This activity depletes their fat reserves so much that they often die before spring arrives (and before the insects return that bats feed on).

In addition to WNS, a different suite of species is being impacted by large scale wind energy production. Migrating bats pass through these large scale developments and many are either directly hit by wind turbine blades or the drastic change in air pressure near turbine blades causes tissue damage in their lungs and they are found dead with no external injuries; a condition known as barotrauma.

Due to these threats, especially in response to WNS, the National Park Service has been providing WNS specific funds to those that apply and are selected. The Mojave Desert Network has been lucky to be a recipient of WNS funds since 2018. This has allowed us to develop a pilot monitoring plan for six of the network parks and hire additional staff to support implementation. The bat monitoring plan includes three different objectives:

1. Acoustic monitoring
2. WNS surveillance
3. Bat Blitzes

The plan primarily emphasizes **acoustic bat monitoring**, following a continental wide program. Bats are notoriously difficult to study being a mostly silent (to the human ear) nocturnal animal.

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Some very crafty scientists and engineers developed devices, called bat detectors, that record the echolocation calls of bats (see Figure 1). These calls can then be viewed as sonograms on special software that attempts to classify these calls to species, based on known call characteristics. Though since bat calls can have high variability, an expert then verifies a subset of calls so we are fairly confident whether a specific species is present in a specific area.

Figure 1. Bat detector is placed on the end of a long pole to record bat echolocation calls. NPS photo

The North American Bat Monitoring Program (NABat for short) was established in 2015 to track bat populations at regional or continental scales. We have adapted this large-scale program to better track bat populations at a park scale. Detectors are deployed at parks in "high priority" areas for the large scale analysis as well as other areas within a park that are known or thought to have high quality bat habitat. These are usually areas of open water where bats can drink, as well as springs and other areas with diverse riparian vegetation that has higher insect abundance than the typical desert scrub areas that encompass MOJN parks.

We have identified 64 different detector locations across the six parks. These six park units include: Death Valley, Great Basin, Joshua Tree, Lake Mead, Mojave, and Parashant. An exciting aspect of this project has been collaborating with parks on getting all of these detectors deployed for at least four nights, twice a year (once in winter, and again in the summer). Without park support we likely would not be able to sample half of these locations.

The second objective of this pilot plan is to conduct WNS surveillance. We do not believe the fungus that causes WNS has arrived at MOJN parks, but we hope to document it quickly if it does. This entails capturing bats during the spring and swabbing their faces, wings, and bodies with a cotton swab which is then sent to a lab at Northern Arizona University for genetic testing (see Figure 2). Last year was our first year

Figure 2. A swab is used to collect cells for genetic testing and to detect WNS fungus. NPS / Joseph Ladd

to implement this and we were able to capture 79 bats from four different parks (LAKE, DEVA, PARA, JOTR), and as we had hoped, all samples came back negative for the fungus. This year we intend to try and swab bats from MOJA and GRBA as well. Again, we have had great park support in these efforts. Our two-person bat crew couldn't do it alone!

For our third objective –- Bat Blitzes –- we had our first blitz in Parashant in 2017 (see resource brief). Joshua Tree hosted the second bat blitz in 2018 and included staff from six of the network parks as well as from Grand Canyon and Pinnacles national parks. See this link to download our new Joshua Tree bat blitz brief. In 2019, Great Basin hosted the blitz and it expanded even more, to include staff from all previous parks as well as Lava Beds National Monument, Zion National Park, and Timpanogos Cave National Monument! We do not have a resource brief for this event yet, but we captured 183 bats representing nine species plus another 500 Mexican free-tailed bats from a migration stop-over cave roost just outside the park boundary. We are very excited for this year's bat blitz which will be hosted by Death Valley sometime in early fall and expect it to be just as successful.

Getting this pilot plan off the ground has been an exciting, yet sometimes daunting task but excitement from MOJN and park staff have helped keep the momentum going. Bats were not identified as a specific vital sign for the Mojave Desert Network; however, a broader "At Risk Species" vital sign that has not been implemented at MOJN incorporates well what we are trying to do to track bat populations over time; this we hope will allow park staff to be more prepared to manage bats.

–Allen Calvert, Program Manager
 Mojave Desert Network

For more information see our new
bat monitoring web page!

Program Manager's Corner

Wow, has it really been two and half years since the last MOJN newsletter?!? There's a lot to reflect about over this time, and much to anticipate for the future, so today's PM Corner will be a bit of me musing about where we have been and where we are going here at MOJN. As you will see later in this issue, we have had a number of staff changes over the last couple years including our former science communication "guru" leaving us which is the primary reason we have been without a newsletter for so long. However, with the infusion of two new part-time "gurus" now assisting us in communicating science to the public and our parks, we have recently been energized in our efforts which has resulted in a huge boost to our social media presence. If you are not following us on Facebook or Instagram, I highly recommend you do so!

Our hydro and vegetation teams both lost some long-time lead technicians during this time as well. In addition to our amazing lead tech replacements, we have also gained some new technicians which have expanded our capacity to support our busy monitoring schedule.

As of this year we look to be in full protocol implementation mode for the first time! Whether it's desert spring, upland vegetation, selected large spring, or spring vegetation monitoring, this late winter/early spring has been full steam ahead.

In addition, we have been leading the efforts on a new collaborative bat monitoring plan for the network (see separate article on what we are up to there!). This has meant we have had 3-4 different crews out almost every week. And while the summer has usually been our slow season with primarily only having streams and lakes monitoring up at Great Basin National Park, we have added white pine and aspen monitoring protocols to our park vital sign monitoring efforts. Being busy is probably an understatement, however our teams have been amazing at keeping an upbeat attitude and their love of our parks is evident in their character.

In closing, I just want to thank the many park staff that have been interested in our work and have been assisting as they have time which has greatly increased park awareness of MOJN and the Inventory and Monitoring Program's efforts to not only collect sound scientific data on park natural resources, but also communicate that science with park staff and the public. If you are reading this and have not had the opportunity to join our staff on a field trip, feel free to contact me and we can see if we can make your schedule work with ours. I have been very fortunate to steer the MOJN ship these past three and a half years and I look forward to many years to come!

–Allen Calvert

Spring 2020 Field Schedule

Protocol	April	May	June	July	August	September
Aspen	–	–	–	GRBA (tentative)	–	–
Bats	[1]GRBA [1]JOTR [1]MOJA [1]PARA	DEVA, GRBA JOTR, LAKE MOJA, PARA	DEVA GRBA PARA		–	DEVA (bat blitz)
Desert Springs	[1]PARA	–	–	–	–	–
Integrated Uplands Vegetation	–	–	–	–	–	–
Selected Large Springs	–	GRBA	JOTR LAKE MOJA PARA	–	–	JOTR LAKE MOJA PARA
Spring Vegetation	[1]DEVA	–	–	–	–	–
Streams and Lakes	–	GRBA	–	–	–	GRBA
White Pine	–	–	–	–	GRBA	GRBA

[1] April monitoring has been cancelled or postponed due to coronavirus-related travel restrictions. Monitoring in subsequent months is also uncertain pending decisions about travel and staff safety during the unfolding epidemic.

Monitoring Program Staffing Updates

Hail –

Joseph Ladd
Joseph joined the network in November 2018 as the Field Logistics Lead Biological Science Technician. He has since been scheduling and implementing a variety of vegetation protocols and bat implementation plans. Joseph comes with a wide breadth of experience from parks all over the west including Denali, Lake Mead NRA, Mount Rainier, Saguaro, and Yosemite as well as previous work as a Crew Leader with the Northern Great Plains Network and the North Coast Cascades Network. Joseph has a B.A./B.S. in Ecological Science and Chemistry from The Evergreen State College, Washington.

Marisa Monroe
Marisa joined the network in October 2019 as a Physical Science Technician. She assists with water quality monitoring of springs, streams, and lakes within our network parks. Previously, she worked in Mt. Hood National Forest, monitoring out-migrating salmonid populations and assisting with large-scale river restoration projects, and throughout the west as an interpretive park ranger. Marisa received her B.S. in Fisheries and Wildlife Science from Oregon State University, as well as a B.A. from Colgate University in International Relations and Chinese.

Farewell –

MOJN bid farewell to two field staff last fall. **Alex Whalen**, former Lead Biological Science Technician departed to become a Fire Ecologist for Camp Pendleton Marine Base in California. **Carissa Wilkerson**, Co-Lead Physical Science Technician left to pursue other opportunites.

Transitions to New Positions –

Jennifer Bailard
As the water resources lead for the network, Jennifer oversees the monitoring of springs, streams, and lakes. Originally from the San Francisco Bay Area, she joined the network in 2013 as an intern with the Student Conservation Association. She became a physical science technician in 2014 and then a physical scientist in 2019. In the past, Jennifer has also worked at Death Valley National Park and Big Bend National Park. Jennifer received her B.A. in Science of Earth Systems (Biogeochemistry) from Cornell University.

Logan Combs
Logan originally joined MOJN as a Conservation Legacy intern in 2017, but has now returned as the new lead physical science technician in 2019. Logan received his B.S. in Geology and Environmental Science from the University of Tennessee, and his M.S. in Geoscience from the University of Nevada, Las Vegas, which focused on the geology of the interior of Mars. Prior to working with MOJN, he spent some time doing fisheries and elk reintroduction work at Great Smoky Mountains National Park. Currently, Logan heads up the logistics and planning for all of MOJN's monitoring of desert springs, streams and lakes. He also performs quality control on all continuous stream and lake hydrology data, and helps maintain MOJN's water quality monitoring equipment.

Kimber Godfrey
Kimber is a biological science technician for MOJN, currently acting as field lead for the network bat monitoring protocol. Last year she was a Great Basin Institute Research Associate at MOJN. During that time she worked on acoustic bat monitoring and bat capture for white-nose disease surveillance as well as supporting spring vegetation, desert spring, whitebark pine, and aspen monitoring protocols. Before working for MOJN, Kimber worked at Pinnacles National Park as an intern monitoring raptors and condors. Her first field job was for the Klamath I&M Network based out of Ashland, OR doing bat acoustic monitoring, bat capture for inventory, and interpretive presentations. Kimber received a B.S. in Ecology and Biodiversity from Humboldt State University.

Science Communication Staffing Updates

Farewell – Janel Brackin, Science Communicator to Crime Scene Analyst!

Janel Brackin, former Science Communications Lead for MOJN, departed in February 2019 for a Crime Scene Analyst position with the Las Vegas Metropolitan Police Department (LVMPD). Since

Janel Brackin (left) with LVMPD co-worker

this is MOJN's first newsletter since her departure, we wanted to acknowledge her many contributions and let you know how her new gig is going! Janel started with MOJN July 2011 in a Student Career Employment Program appointment, and became a permanent MOJN employee a year later.

Janel pursued her interests in biology and criminal justice through a dual major - B.S. in Biology, B.A. in Anthropology - at University of Nevada, Las Vegas. When she learned at a job fair that the LVMPD was not currently accepting resumes, she pursued another lead – and sent a resume to then MOJN Program Manager Nita Tallent.

Nita brought Janel on-board to focus primarily on science communication, but Janel also wore other hats – Administrative Assistant (periodic purchasing, supply inventories, meeting minutes), and Collateral Duty Safety Coordinator. In the latter role, she assisted the parks with Operational Leadership courses and coordinated MOJN safety training and needs.

Janel enthusiastically established and carried out the network's science communication program, under the supportive mentorship of Nita, followed by Allen Calvert in 2016. That program included: the network newsletter; new web pages; resource briefs; a social media presence with Facebook, Insta-

gram, and YouTube; editing and formatting technical reports; developing a Communication Implemenation Plan; organization for the network's first science symposium; and presentations and site visits to strengthen relationships with park staff.

"I always felt very motivated (at MOJN)," Janel said recently. "We were all working toward the same thing, and I loved being part of a like-minded team with common goals. It truly felt like a family. I felt like I was contributing to something noble. And there was always a sense of infinite possibilities, that more could always be done."

And, so…how has Janel managed her transition to Crime Scene Analyst?

"The first six months I experienced some culture shock, and at first I thought I'd made a mistake," Janel said. "You learn a lot and have a lot thrown at you – including 13 weeks in an academy training program and 13 weeks in field training, followed by a proficiency exam to ensure competency to work through a crime scene on your own."

As time went on, Janel got more comfortable, formed relationships with her squad-mates, and now enjoys her new job, which requires constant thinking, technical skills, and detail-oriented focus.

As Crime Scene Analyst I, Janel processes crime scenes having to do with commercial or residential properties (burglaries, damage to structures). She is briefed by a police officer at the scene and does an independent walk-through to put the story together, then documents the scene through notes and photography, and collects evidence, all of which contribute to the report she produces.

"Everyone is supportive and it is a good work environment," Janel said. "People are willing to help each other learn and grow."

Hail – Two Science Communicators Working Part-time with MOJN

Lise Grace
Lise has worked for the North Coast and Cascades Network since 2002 as a biological / data technician, supporting inventory projects with data compiling and entry and helping long term monitoring projects with protocol development, fieldwork, and publications. Since 2012, she has also assisted MOJN with document editing, formatting and publishing protocols and monitoring reports, website updates, and other assorted tasks. Lise has a B.A. in Studio Art from Colorado College and an M.S. in Environmental Science from Huxley College of the Environment, Western Washington University, with an emphasis on Landscape Ecology.

Linda Mutch
Linda has been a science communication specialist with the Sierra Nevada Network since 2011, and has also been a coordinator for the Northern Rockies Fire Science Network for the past two years. She started providing MOJN part-time science communication support in December 2019. She is supporting the network's social media team and developing newsletters and resource briefs. She may also help organize the fall science symposium. Linda has a B.A. in Biology from the University of Oregon and an M.S. in Watershed Management from the University of Arizona, with a focus on dendrochronology and fire ecology.

First Ever Mojave Desert Science Symposium a Success!

Former Mojave Desert Network (MOJN) Science Communications Lead Janel Brackin spent the better part of a year planning the Network's first ever Science Symposium. It was to take place on December 4-5, 2018, with the goal of enabling park staff to learn firsthand about many of the science and research efforts taking place throughout MOJN parks. As the dates approached, Janel had everything in order. The venue, the speakers, the agenda, dozens of attendees; all were ready to go. Then, when a last-minute holiday was declared to mourn the passing of former President George H. W. Bush, the symposium was postponed until after the holidays. However, a lengthy government shutdown ensued, and Janel received an exciting new job offer that she couldn't refuse. The symposium had to be put on hold.

After a couple months of catching up from the shutdown, MOJN Program Manager Allen Calvert began figuring out what was needed to get the symposium back on track. He found a new, more spacious venue, and new dates that seemed to work for most of the original presenters. He recruited myself and MOJN Physical Scientist Jennifer Bailard to help make it happen. Thanks to the well-organized planning materials Janel left us, and the patience, support, and participation of all involved, the first ever MOJN Science Symposium finally took place on November 6th and 7th, 2019!

Ali Ainsworth, Ecologist at Death Valley National Park, gives a talk about a multi-pronged appproach to managing invasive burros. NPS / Mark Lehman

recharge, higher risk of Joshua tree deaths, reduced habitat for desert tortoises, and more. Closing on a more hopeful note, Dr. Gonzalez gave examples of potential solutions and success stories, like Golden Gate National Recreation Area's transition to 100% renewable energy. His slides are now available online.

More than 80 people from no fewer than nine government and academic institutions showed up at the Lake Mead Water Safety Center to attend the symposium, which featured 24 presentations and over a dozen posters. The first day kicked off with an opening presentation by National Park Service Principal Climate Change Scientist, Dr. Patrick Gonzalez. His talk walked us through the human causes of climate change and how it has already impacted MOJN parks. For example, Dr. Gonzalez discussed the temperature and precipitation changes each park has experienced, the role of climate change in the ongoing Colorado River Basin drought, the doubling of wildfire area in the western US, and the decline in bird species richness in MOJN parks. He further explained the risks that continued emissions pose to MOJN parks, such as increases in extreme temperature days, higher probabilities of intense droughts, reduced groundwater

Arrowhead-shaped word cloud created from attendees' answers to the open-ended questions (e.g. what worked?, what didn't?, other feedback?) in the symposium follow-up survey.

Many more engaging presentations followed. We learned about the evolution of the long-term monitoring program for the critically endangered Devils Hole pupfish, the remarkably fast and consistent responses of Mojave Desert wetlands to past climate change events, and an innovative effort to monitor dark skies. Additional talks delved into Lake Mead fish conservation, inter-agency invasive plant management, Scotty's Castle flood modeling, Mohave tui chub halbitat analyses, and Blue Point Pyrgulopsis distribution. The day concluded with an impactful presentation about Mylar balloons, including a preliminary effort to engage the public and collect data on balloon abundance in Death Valley.

After an evening of socializing (and for some symposium attendees, camping at Boulder Beach!), day two of the symposium got underway with an opening talk by Debra Hughson, Mojave National Preserve Chief of Science and Resource Stewardship.

She discussed the challenges of modeling bighorn sheep habitat near water developments in order to predict how the sheep might utilize water developments in new areas. As day two progressed, talks about communication and collaboration opportunities with park interpretive staff, the public, and among DOI agencies, were interspersed with others about rare plant surveys, managing increased visitation, managing invasive burros, rattlesnake population growth, and modeling climate refugia for Joshua trees. Monitoring was another common theme among several of the talks: Desert spring, invasive plant, and bat monitoring were each featured.

Finally, MOJN Ecologist Nicole Hupp concluded the symposium with a presentation about the past, present, and future of the MOJN Vital Signs Monitoring Plan. Using several vegetation monitoring protocols as examples, she demonstrated why monitoring is so important to achieving the National Park Service mission of preserving park resources unimpaired for future generations.

Mysterious microphone feedback issues aside, symposium attendees overwhelmingly enjoyed the presentations, and the rare opportunity to learn from and network with one another. In a follow-up survey, most respondents also indicated that they'd like to see the symposium become an annual event following a similar format: two half-days of mixed-theme sessions (see Arrowhead word cloud on previous page ccreated from survey responses). Given this, MOJN is looking towards organizing another science symposium this fall! In the meantime, check out the all of the 2019 poster and presentation abstracts in the NPS Data Store.

–Jessica Weinberg McClosky,
  Science Communication Specialist
  San Francisco Bay Area Network

Science symposium participants listen to a talk by Ali Ainsworth. NPS / Mark Lehman

Join Us on Social Media!

The Mojave Desert Network has formed a social media team who take turns doing Instagram and Facebook posts. We share highlights from our field work, new products, natural history information, natural and cultural resource-related news from MOJN parks, and posts that highlight NPS-wide monthly theme. MOJN also has a YouTube channel.

You may follow us at:

Facebook – www.facebook.com/npsmojn
Instagram – @mojnnps or instagram.com/mojnnps
YouTube – @mojavedesertnetwork

Please feel free to contact Linda Mutch (linda_mutch@nps.gov) if you have park natural or cultural history stories you would like us to share.

Meet Our Seasonal Staff

Katie Fitzgerald, Biological Science Technician
Katie assists with acoustic bat monitoring, white-nose surveillance and vegetation and hydrology monitoting projects. Her fascination with bats has led her to work with different agencies throughout the western U.S. and research projects in Mexico, Madagascar, and Borneo. She is excited to be with MOJN, working in a position that combines her love for the outdoors, desert ecosystems, and of course bats! She has a B.S. in Natural Resource Management and Conservation from San Francisco State University. .

Daniel Goldstein, Physical Science Assistant
Daniel assists with monitoring desert springs. He settled in Las Vegas in 2013, and fell in love with the open desert, cramped canyons, and soaring mountains. He spent a decade working many types of jobs (including events, rideshare, cook, and game design), but later changed his life's path to follow his interest in science. He received a B.S. in Earth and Environmental Science at University of Nevada, Las Vegas. .He joined MOJN as an AmeriCorps Conservation Legacy intern and began doing field work in October 2019 - he loves being immersed in science and nature, working to preserve and protect our nation's natural resources.

Nico Matallana, Biological Science Intern
Nico assists with vegetation monitoring (integrated uplands, spring vegetation, and invasive species early detection) and bat monitoring projects. Originally from the Pacific Northwest, he grew up backpacking in wet ferns and cedar forests. Nico has an internship through the Americorps Conservation Legacy Stewards program, and this is his first time working in the desert southwest, where he is thrilled to study this ecosystem and learn about the ingenious ways plants and animals have developed to survive here! He has a B.S. in Ecological Restoration, a B.S. in Resource Conservation, and B.A. in Ecological and Organismal Biology & Environmental Studies from the University of Montana.

Kyle Smith, Biological Science Technician
Kyle assists with vegetation monitoring projects (integrated uplands, spring vegetation, and invasive species early detection). He has worked in seasonal biology jobs across the western U. S., usually through non-profit organizations. This work included fish and salamanders in the Pacific Northwest and northern California Redwood Coast areas; vegetation monitoring implementation in Colorado; and endangered animal species in southern California. He has gained an affinity for the desert southwest with its year-round sunshine and open spaces. Kyle has a B.S. in Environmental Science from Oregon State University.

The Mojave Network Inventory and Monitoring (I&M) Program is one of 32 networks of parks established under the National Park Service I&M Division to implement long-term ecological monitoring across multiple park units that share relatively similar ecological attributes. Data collected through this program will help inform park resource management decisions.

Click here for MOJN staff contact information

MOJN I&M monitors natural resources at 9 national park units:

CAMO: Castle Mountains National Monument

DEVA: Death Valley National Park

GRBA: Great Basin National Park

JOTR: Joshua Tree National Park

LAKE: Lake Mead National Recreation Area

MANZ: Manzanar National Historic Site

MOJA: Mojave National Preserve

PARA: Grand Canyon-Parashant National Monument

TUSK: Tule Springs Fossil Beds National Monument