



The Oasis

Fall 2020

In this issue

New Products.....2

**Spring and Summer
Fieldwork - COVID
Consequences.....3**

**November - April
FY2021 Field Sched-
ule.....3**

**Monitoring Program Staffing
Updates.....4**

**What Is Happening with
Inventories 2.0?.....5**

Join Us on Social Media!.....5

**Collaborating across Monitor-
ing Networks.....6**

**Conservation Initiative
Spawns Numerous Work
Groups.....7**

**A Few Photo Highlights from
the Field.....8**

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



Devin Stucki, Ecologist from Upper Columbia Basin Network, measures the diameter at breast height (DBH) of a bristlecone pine at Great Basin National Park. Photo by: Kyle Smith

Big Win - White Pine Monitoring Plots All Installed!

Our August white pine monitoring trip to Great Basin National Park gave us cause for celebration – we completed our installation of white pine monitoring plots! With help from colleagues Melissa Nicolli and Devin Stucki of Upper Columbia Basin Network, we installed 10 monitoring plots, for a total of 30. This pine monitoring protocol is shared among multiple monitoring networks, and we all benefit from the collaborative opportunities it presents – including field work, data management, analysis, and publications. We also thank Great Basin National Park (GRBA) staff for their support of this project.

At GRBA, we track changes in bristlecone pine and limber pine, both iconic high-elevation white pine species. To install a monitoring plot, we navigate to the sites (randomly located ahead of time). We measure out the area of 50 by 50 meter plots. Then we get to work tagging trees and measuring them, as pictured above where Devin is measuring

diameter at breast height (DBH) of a bristlecone pine. We measure all the trees within the plot area and assess their health. We look for signs of bark beetles and disease. We also note how many dead trees there are and how many very young trees, or seedlings. Each year we will return to monitor a subset of plots to track changes over time.

White Pine Importance

These long-lived, high-elevation pines are considered foundation species. They grow in places too harsh for other tree species and create locally stable environments on which other species depend. They regulate important ecosystem processes such as snowmelt and streamflow. They enable shade-tolerant species to establish and provide habitat and food for birds and mammals. If foundation species are lost, a cascade of impacts can occur, including shifts in biological diversity and in the function and stability of the community.

Continued on page 2

White Pine Monitoring (Continued from page 1)

What Are Threats to White Pines?

Western coniferous forests are facing growing threats, including outbreaks of native pests and pathogens, invasive species, and altered disturbance regimes. Increased atmospheric warming, carbon dioxide concentration, and nitrogen deposition, as well as changes in precipitation (timing, amount, and type) and decades of fire suppression pose short- and long-term threats. Of particular concern is the exotic fungal pathogen *Cronartium ribicola*, which causes white pine blister rust in five-needle pines. Blister rust eventually kills the host tree, altering forest stand succession and thus ecosystem structure and function. At this time, blister rust has not been observed in GRBA white pines, and initiating monitoring while stands are healthy will facilitate early detection of this pathogen, as well as the impacts of other threats.

More Information

We look forward to reporting on this initial dataset, and continuing to track the health of these inspiring pines. For more information, download our [new resource brief](#) or visit our project web page. Contact [MOJN Ecologist Nicole Hupp](#) if you have questions.

–Nicole Hupp and Lise Grace



Bristlecone pine cone - This dark purple female cone shows the incurved reddish brown bristles for which the pine is named. NPS photo

New Products

MOJN Integrated Upland Data Package 2012-2020 Published

MOJN published both a [redacted and full integrated upland dataset](#) (the full dataset is accessible upon request by NPS staff). The redacted one is accessible to anyone.

Description: You can find all years of data in the data package (2012-2020) as well as metadata and our quality control summary. To round out our data release, we also published an updated version of our protocol standard operating procedures – [Integrated upland protocol of the Mojave Desert Network: Volume 2, Standard Operating Procedures v2.0](#)

Vegetation Mapping Classification Reports

MOJN worked with the NPS Vegetation Inventory Program to edit and publish the joint vegetation classification report for MOJA, DEVA, CAMO, and LAKE. Since these reports are long and unwieldy, they were published as four separate documents: the report, association descriptions, alliance descriptions, and field key. All are available to download at [this link](#).

Resource Briefs

Below are recent briefs that we've completed – overviews of two monitoring projects and the MOJN vital signs monitoring program.

- [Spring Vegetation Monitoring](#)
- [White Pine Monitoring](#)
- [Vital Signs Monitoring in the Mojave Desert Network](#)



Spring and Summer Fieldwork - COVID Consequences

With the onset of the COVID-19 pandemic in late March and the resulting travel restrictions and safety concerns, numerous planned MOJN monitoring efforts were canceled. A summary of what was cancelled and how we re-directed this time is noted below:

Desert Springs Vegetation: Spring vegetation monitoring was canceled for 5 springs located at Death Valley NP (DEVA). This would have been the first implementation of this protocol at DEVA. Effort was redirected to Integrated Uplands office-based work.

Bat Capture Surveys: These surveys were planned to swab bats in 5 MOJN parks to detect the presence of the fungus that causes White Nose Syndrome (WNS). This would have been the second year of sampling, utilizing NPS WNS funds. Effort was re-directed to enter, review, and process bat acoustic data.

Bat Blitz: DEVA Bat Blitz canceled.

Integrated Uplands (IU): This monitoring ended early in March - we missed just one of 35 creosote plots at Lake Mead NRA (LAKE), but none of the 3 plots were sampled at Manzanar. Effort was redirected to doing field recon for IU in Great Basin NP (GRBA), building data collection apps, and certifying 6 years of data.

Desert Springs: Remaining monitoring was canceled at 34 out of 45 springs after one visit to Grand Canyon-Parashant NM (PARA). Effort was redirected to creating an R data analysis package, reviewing 10 years of benthic macroinvertebrate data, and updating SOPs.

Selected Large Springs: Biennial benthic macroinvertebrate and water chemistry sample collection was canceled for 3 springs in Joshua Tree NP (JOTR) and Mojave NM (MOJA).

A lot still got done!

Thanks to help from park staff, we completed **acoustic bat monitoring** at six parks over the summer - all cells were sampled for DEVA, JOTR, LAKE, PARA, MOJA, and GRBA.

We completed both the **streams and lakes monitoring** at Great Basin, and we thank GRBA staff for their support with bi-weekly discharge and water quality visits and for joining us on our annual lake monitoring trip.

We collected **water chemistry** samples for the first time at 4 springs in LAKE and PARA, and also began monitoring 3 springs for the first time in GRBA, with the assistance of GRBA staff.

We completed 34 out of 35 **Integrated Uplands monitoring plots** at LAKE.

Our completion of all remaining **white pine plots** at GRBA is highlighted in the article on pages 1-2.

This year emphasized the importance of collaborative work among networks to support monitoring. See the article on page 6 about our collaborations with four networks just before and during the pandemic, supporting integrated uplands monitoring in MOJN, white pine monitoring in MOJN and the North Coast and Cascades Network, and lake monitoring in the Sierra Nevada Network.

November - April FY2021 Field Schedule

Protocol	November	December	January	February	March	April
Bats (Schedule estimate, may change)	–	–	DEVA MOJA PARA	JOTR LAKE PARA	–	–
Desert Springs	DEVA LAKE	DEVA JOTR	JOTR MOJA	DEVA	DEVA PARA	PARA
Integrated Uplands Vegetation	–	–	–	JOTR	JOTR	–
Selected Large Springs	–	JOTR MOJA LAKE PARA	–	DEVA	JOTR MOJA LAKE PARA	–

Monitoring Program Staffing Updates

Transition to Data Scientist Position –



Sarah Wright

On September 28th, Sarah Wright started a new Data Scientist position that is shared between MOJN and seven other Inventory & Monitoring networks in Interior regions 8, 9, 10, 12 (formerly Pacific West Region). She will remain duty-stationed locally in Boulder City, and MOJN may still support and utilize up to 50 percent of her time. Sarah has served as the MOJN Assistant Data Manager since 2016.

What does a data scientist do? The data science process brings together technical expertise, subject matter knowledge, and statistical & machine learning techniques in order to gain actionable insight from data. Common data science products include automated reports and briefings, data dashboards, machine learning models, and interactive data visualization apps. As Data Scientist, Sarah is excited to begin collaborating with other networks and exploring new datasets.

Farewell and Onward to Graduate School –



Katie Fitzgerald

Katie left in early August to start graduate school at Angelo State University, San Angelo, Texas. She worked with MOJN through the Great Basin Institute (GBI) as a Biological Science Technician, supporting the bat monitoring project. Katie describes her next adventure -

I am attending graduate school to investigate diets of Western Texas bats by using molecular approaches. The position I held at MOJN and the support I received embolden my decision to continue following my passion of conservation and bats. I look forward to furthering my education to better understand these marvelous organisms and how to better protect the resources they depend on.

I feel like the global pandemic came way too early in my MOJN GBI position, I think the accommodations, communication and the creativity in making the work continue was absolutely motivating. I enjoyed being included with webinars and North American Bat Monitoring Program meetings. I think that's important for technicians who want to move forward in their careers to get a taste of the management side and the importance of working across multiple states and with different organizations.



Nico Matallana-Meija

Nico left last May to start his graduate field work in Glacier National Park, Montana. He worked with MOJN as a Biological Science Technician through GBI, supporting vegetation and other monitoring projects. Nico writes about his MOJN time and his new path -

It was a short season with MOJN, but it was packed with exciting field work and incredible learning opportunities. While at MOJN, not only did I work with the logistics of collecting data in wild places, I also dug into the back-end of data collection and helped make digital survey forms that will make data collection worlds more efficient. Serendipitously, I arrived in Glacier National Park into a program that greatly needed the data collection skills that I had just learned in MOJN. I am going to graduate school at Colorado State University to learn how to be an Ecologist and I feel lucky that MOJN gave me a head-start in this direction!

The Last Word(s) –

The Editor regrets inadvertently cutting off this last great quote from Janel Brackin (The Oasis, Spring 2020, Farewell article): Janel remains nostalgic about her time at MOJN – “All the skills I learned there have really helped me. My time at MOJN made me who I am today. And I am forever grateful for that.” Janel is a Crime Scene Analyst with Las Vegas Metro Police Department.

On Detail as Acting Resource Management & Compliance Division Chief, Lake Mead NRA –



Allen Calvert

Allen Calvert, MOJN I&M Program Manager, began a detail as Acting Chief of Resource Management and Compliance at Lake Mead National Recreation Area (LAKE) on July 20. The division includes these branches: Cultural Resources; Lands, Planning, and Compliance; Aquatic Resources; Vegetation Resources; and Wildlife and Physical Resources. In addition, this position oversees a regional hydrologist as well as the LAKE Invasive Plant Management Team program manager. The detail is anticipated to end on November 13.

“It has been a challenging yet productive opportunity to see how a park is managed and how resources are integrated into other projects, and to be involved with park decisions at the superintendent level,” Allen said.

What Is Happening with Inventories 2.0?

The next generation of National Park Service natural resource inventories, Inventories 2.0, will be launched in the coming year as a set of 12 species inventory pilot studies that span regions, taxa, data collection methods, and management uses of data.

To develop the [Inventories 2.0 Plan](#), the Inventory & Monitoring Division (IMD) used park resource stewardship strategies and foundation documents, and sought input from parks, I&M networks, regions, and national programs. Species inventories ranked as a high need among all of these entities.

Ten types of inventories were identified as servicewide needs. IMD will lead three of the ten inventories (Species, Vegetation Community Mapping, and Surficial Geology/Soils Mapping), and contribute to the others in partnership with other programs.

For the three IMD-led inventories, IMD will develop (or work with the Geologic Resources Division to develop)

peer-reviewed inventory science plans that lay out inventory objectives and methods for data management, analysis, and integration to ensure that credible and useful inventory data are provided to parks in a timely manner.

In the inventory proposal process, the request for data will originate from parks in a technical assistance request format. IMD staff will coordinate with park and network staff to draft a study design, and project implementation will be managed through contracts that IMD administers. The announcement for Inventories 2.0 is embedded within the recently announced [FY 2021 Technical Assistance Call Guidance](#). (Internal link accessible to NPS only).

During the next two years, IMD will focus on meeting species inventory needs that are directly tied to park management. IMD is using information learned during the FY 2020 pilot study design and solicitation processes to determine study criteria and screening processes for 2021. To learn more, watch the [recorded webinar](#) (NPS only).

Join Us on Social Media!



The Mojave Desert Network shares 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 themes. MOJN also has a YouTube channel.

You may follow us at:

Facebook – www.facebook.com/npsmojn

Instagram – [@mojnnps](https://www.instagram.com/mojnnps) or [instagram.com/mojnnps](https://www.instagram.com/mojnnps)

YouTube – [@mojavedesertnetwork](https://www.youtube.com/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.

Collaborating across Monitoring Networks

The MOJN monitoring program both provided and received field monitoring assistance during the 2020 field season. While collaborative monitoring may be valuable any year, it was particularly helpful this year when precautions related to the pandemic resulted in reduced seasonal staffing in some networks. MOJN staff provided field support to the Sierra Nevada (SIEN) and North Coast/Cascades (NCCN) monitoring networks, and received help from the Northern Colorado Plateau (NCPN) and Upper Columbia Basin (UCBN) networks.

Before the pandemic hit, NCPN botanists Sarah Karenin and Amy Washuta joined the MOJN Integrated Uplands team at Lake Mead in mid-February, helping us get so close to completing all our creosote plots. And they loved the warm desert winter!

In late July, MOJN Physical Science Technicians Logan Combs and Marisa Monroe traveled to Kings Canyon National Park to sample water chemistry at a high-elevation wilderness lake for SIEN. Marisa had worked on a SIEN lake monitoring crew in 2018, and both Logan



Logan filtering a water sample at McGee Lake, Kings Canyon National Park. NPS photo / Marisa Monroe

and Marisa did safety and sampling training remotely with SIEN's Physical Scientist before their field tour. They hiked two days to reach McGee Lake, and after completing the sampling, they backpacked out numerous water samples and shipped them to a lab for analysis.

Their work helped SIEN complete all of its annual lake panel sampling, and Logan and Marisa enjoyed escaping the desert heat for several days!



View of Mount Rainier from a whitebark pine monitoring plot. NPS photo / Joseph Ladd

MOJN Field Logistics Lead Joseph Ladd traveled to Mount Rainier National Park in western Washington to assist with their White Pine monitoring project. MOJN and NCCN are just two of many networks across the western US that monitor White Pine populations. "White Pine" is a term used to refer to a group of closely related pine species which share common characteristics and, as a result, share the same vulnerabilities to specific pests and environmental threats. While MOJN monitors the Great Basin Bristlecone Pine and Limber Pine, NCCN monitors Whitebark Pine, which grows in the cold, high-elevation areas of their parks.

Joe, along with an assemblage of NPS field crew skilled in White Pine monitoring, joined forces to tackle a handful of plots in the remote reaches of Mount Rainier National Park. Over 7 days the team monitored plots in an area on the north side of Mount Rainier, between the Carbon and Winthrop Glaciers. Though the hiking and tree wrangling were physically challenging, and the data collection and recording mentally taxing, the looming mountain and non-stop breathtaking views kept the crew going strong.

At the end of the week, five plots were installed and over a thousand trees were measured, attesting to the power of collaboration!

In August, UCBN staff assisted MOJN in completing installation and monitoring of GRBA white pine plots. See the article on page 1 for more information about what we accomplished!

Conservation Initiative Spawns Numerous Work Groups



I&M staff gathered in Arizona to share ideas and plan actions to move the Conservation Initiative forward. Photo / Jessica Weinberg McClosky

The National Park Service Inventory & Monitoring Program started 20 years ago, with a bold vision and plan, and this year we have been taking stock of where we are and looking toward the future. In early March, I&M staff from all over the country gathered in Prescott, Arizona to craft a vision for the next 20 years, create new audacious goals, and align our actions to reach them. A new [4-page brief](#) (accessible for NPS only) provides an overview of this effort, called the Conservation Initiative.

One outcome was numerous work groups aligned toward reaching program milestones. MOJN staff all attended the Prescott meeting and are participating in the following work groups:

Aquatics: A forum for Inventory & Monitoring Division (IMD) staff and collaborators to share methods, data, and ideas and to develop broader status and trends analyses related to water resources in our parks. (Jennifer Bailard)

Building Park Relationships is working to: 1) forge stronger relationships between our respective parks and networks and 2) create tools that other networks can replicate to do the same. While COVID has slowed this process down, the group is still finding ways to be creative and share successes and lessons learned. (Kimber Godfrey, Marisa Monroe, Allen Calvert)

Data Visualization Community of Practice: The goal is to provide a friendly space for people to discuss data science tools and best practices and to create an on-ramp for people to learn new skills, no matter their experience level. The group is also creating an I&M-wide color palette to use in R and Python programs. (Sarah Wright – Lead, Nicole Hupp)

Ensuring our Data Legacy: Assessing the current guidance on publishing datasets and identifying areas where we need additional guidance, or need to create tools to increase the efficiency of the process. (Mark Lehman)

I&M Biotechs/Field Crews: A place for Inventory & Monitoring field staff to share information and resources, collaborate, & build community across networks. Additionally, it is a place to have dialog about common field issues and shared experiences. It aims to foster collaborations among the field crew community, such as sharing knowledge, work opportunities, and facilitation of crew-sharing efforts. (Logan Combs, Joe Ladd)

Sharing is Caring: Sharing skills and people to institutionalize integration among parks, networks and programs. We are essentially developing and strengthening relationships network-to-network and network-to-park in order to facilitate the sharing of staff, skills, and resources. (Logan Combs, Joe Ladd)

The following two groups started up later, after the Conservation Initiative meeting –

Exploratory Data Analysis (EDA): Focuses on learning about and implementing exploratory data analysis for I&M projects. It is designed for all kinds of users, from beginners to experts, to understand how to conduct EDA. Recorded “workshops” are available on a Teams site and there is a GitHub repository for EDA resources including a “cookbook” that shares workflow, ideas, and code. (Nicole Hupp, Sarah Wright, and Kyle Smith)

IMD Shared Learning Group: The group started as an attempt to brainstorm ways to keep the atmosphere of shared learning, self-reflection, and the community of I&M alive following the Conservation Initiative momentum. We are currently working to turn the IMD All Staff team into a sort of “main page” for the I&M community, where staff can find collections of relevant links, a curated list of trainings, a calendar of live events, and a news page. (Logan Combs)

A Few Photo Highlights from the Field



A hot May day of deploying acoustic bat monitors prompts umbrellas for shade (left). In contrast, a frigid February morning for the vegetation crew, zipping across Lake Mead to monitor Integrated Uplands plots. Photos: J. Ladd.



Invertebrates we seek and those that surprise us. Hydrology Technician picks small invertebrates from an aquarium screen used for collection from large springs (left). A Giant Crab Spider gave the crew an awful fright when it was found seeking shelter from the mid-day sun, nestled in their bat-monitoring gear at Mojave National Preserve (right). Photos: L. Combs and J. Ladd.

Socially distancing while doing Integrated Upland plot reconnaissance in Great Basin National Park. Photo: N. Hupp.



Masked Physical Scientist practicing a new method of taking discharge measurements during an annual streams monitoring visit to Great Basin National Park. Photo: B. Roberts.

[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](#)

