



# The Klamath Kaleidoscope

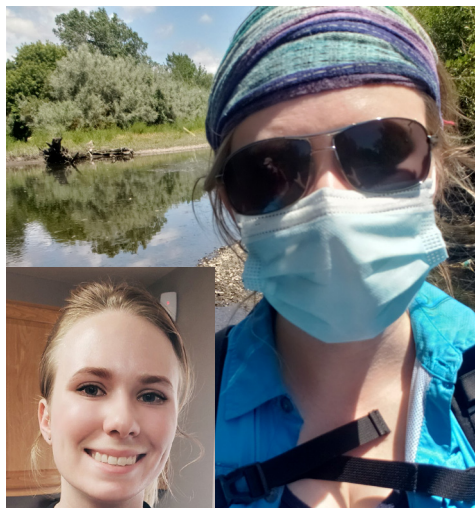
*Newsletter of the Klamath Inventory & Monitoring Network*

*Spring/Summer 2020*

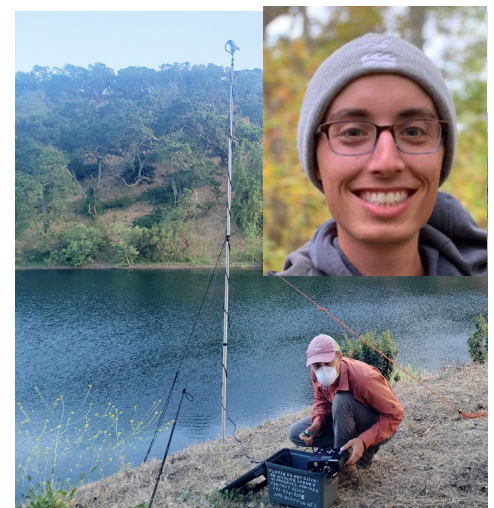
## COVID-19 Stand Down

In response to the COVID-19 pandemic, the NPS Inventory and Monitoring Division implemented a “stand down” of fieldwork in April. Consulting with network parks, and based on safety and logistical reasons, Klamath Network staff canceled our vegetation, streams, and bird monitoring, which were all scheduled to start in spring and early summer. Now that the stand down is lifted, networks are following the NPS Adaptive Recovery Plan to determine whether field activities will occur (e.g., rocky intertidal and whitebark pine monitoring at Klamath Network) and how to do so safely (e.g., social distancing in vehicles, housing, and the field). Given the diversity of staffing, field activities, and operating conditions at each location, I&M networks across the country are making independent, and vital sign specific decisions on summer fieldwork.

Needless to say, losing a season of sampling puts a gap in our long-term monitoring datasets. Fortunately, our statistics guru, Eric Dinger, says that a gap in one year’s scheduled monitoring won’t throw too much of a wrench into analyses. On the upside, we were able to hire two bat crews to work on various projects. One crew is now establishing vegetation monitoring at nearby Cascade Siskiyou National Monument



Christy Walker (left) and Jeremy Vandenberg (right)—masked up against COVID-19—carry on with bat monitoring. The microphone setup records bat calls overnight at an NABat monitoring site.



(see story below). The other crew continues our collaborative efforts with California Department of Fish and Wildlife and Southern Oregon University to establish NABat-style bat population monitoring in California. We also managed to accomplish limited white nose syndrome surveillance at 4 sites near Lassen Volcanic NP, Lava Beds NM, and Redwood NP. Handling of bats was strongly discouraged by state and federal agencies due to the potential risk of transmitting COVID-19 from humans to bats, thus eliminating spring capture and swabbing of bats as a surveillance technique. However, Klamath Network staff used an alternative method, collecting and submitting guano samples from four

colony roosts for testing. So far, all samples have been negative; some results are still pending.

### In This Issue

<a href="#">COVID-19 Stand Down.....</a>	<a href="#">1</a>
<a href="#">IMD - A Closer Look.....</a>	<a href="#">2</a>
<a href="#">IMD - Envisioning 2040.....</a>	<a href="#">2</a>
<a href="#">New Face to Face Briefings.....</a>	<a href="#">3</a>
<a href="#">Eric Dinger - Aquatic Ecologist..</a>	<a href="#">4</a>
<a href="#">Awards.....</a>	<a href="#">7</a>
<a href="#">Cascade-Siskiyou NM.....</a>	<a href="#">8</a>
<a href="#">Where Are They Now?.....</a>	<a href="#">9</a>
<a href="#">Recent Publications.....</a>	<a href="#">9</a>
<a href="#">Field Schedule.....</a>	<a href="#">10</a>

# Inventory & Monitoring Division – A Closer Look



Inventory and Monitoring Division staff gather for the Conservation Initiative workshop in Prescott, Arizona, in March 2020.

Check out new content on the [Inventory & Monitoring Division's website](#) for a window into our work.

IMD's About Us pages include three new sections to help folks become a little more familiar with us:

[Who We Are](#)  
[How We Work](#)  
[Making a Difference](#)

## IMD Conservation Initiative – Envisioning 2040

Inventory & Monitoring Division staff gathered in March 2020 to mark the 20-year anniversary of the division and to chart its way forward. Our goals in the first 20 years were to

- Complete 12 basic inventories in parks to document baseline conditions for natural resources, like air quality, soils, species occurrence, vegetation maps, and more
- Identify key vital signs to monitor in each Inventory and Monitoring Network of parks
- Design and publish peer-reviewed monitoring protocols for each vital sign
- Begin long-term monitoring of these vital signs in parks
- Integrate science into management through collaboration with park managers
- Share information and form partnerships with other science agencies and organizations to advance knowledge of park ecosystems

Having met these initial goals and settled into our long-term monitoring routines, we are looking ahead. Based on a series of workshops leading up to the March gathering, we renewed our vision for how best to support healthy park ecosystems. This vision includes an ambitious new goal:

Our Overarching Goal for 2040:

*Together I&M, partners, and parks generate 2,040 science-based solutions to promote resilient ecosystems.*

We also created a vivid description to help visualize what it looks like to accomplish this goal:

- I&M is transformed by our common vision.
- Our culture of shared leadership and committed partnership facilitates exceptional science and empowers decision makers.
- We bring people together to address conservation challenges with confidence and creativity.

• Our work inspires stewardship in others and is a beacon for the preservation of nature across the globe.

To achieve this goal, we've assigned ourselves specific actions within specific work groups. Here's a sampling of the workgroup topics:

- Building park relationships
- Data visualization
- Science communication
- Innovative climate solutions
- Integrating good ideas across networks
- Financial sustainability
- Aquatics
- Diversity and inclusion
- and more...







## Klamath Network Inventory & Monitoring Program

The National Park Service has implemented natural resource inventory and monitoring on a service-wide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

### Parks in the Klamath I&M Network:

- Crater Lake National Park
- Lassen Volcanic National Park
- Lava Beds National Monument
- Oregon Caves National Monument and Preserve
- Redwood National and State Parks
- Whiskeytown National Recreation Area
- Tule Lake National Monument

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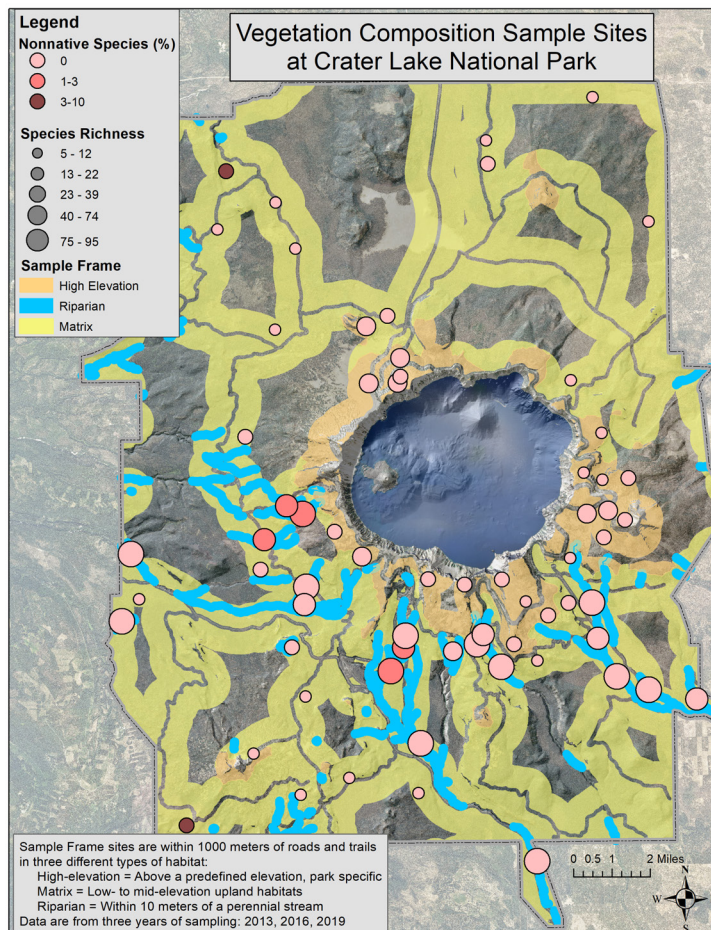
Newsletter writing, editing, and design  
by Sonya Daw

# Introducing Our New “Face to Face Briefings”

Coming to your park soon...

Each year, we collect data in your park to measure the status and trends in the condition of 1 or more of the 9 natural resource vital signs identified for Klamath Network parks. It might be streams and vegetation communities one year, and caves or landbirds the next. This year, for the first time, we are experimenting with a new way to share our results. We know that park resource managers need detailed data in figures, tables, and summaries, but also a chance to ask questions about the findings. We also know that interpreters and other park staff are curious about what we're finding, often to help them field questions from park visitors. To address both of these needs and make our findings more immediately accessible, we have

begun “Face to Face Briefings.” We’ll come to your park (in-person or via video chat) to discuss recent results in a two-part presentation. The first part offers a nontechnical overview for any/all interested park staff. The second part, aimed at resource managers interested in the technical details, takes a deeper dive into the data. We’ve also created a public friendly 2-page brief (“Vital Sign Update”) to complement the more technical material. We invite all interested staff to join us and we look forward to seeing you soon. Our first trial run at a Face to Face Briefing was for 2017 stream monitoring results at Whiskeytown last year. This year we have presented two Face to Face Briefings: stream results from 2017 at Lassen and vegetation community results as of 2019 at Crater Lake.



This map is an example of the kind of information we present in the new resource briefs that accompany Face to Face Briefings. This is the back side of a 2-page public friendly brief summarizing some key results from vegetation sampling at Crater Lake National Park. The front page provides context and explanation for the map results.



# Eric Dinger – Aquatic Ecologist

Eric Dinger is happiest at high elevation in the mountains, whether he's bagging a peak or training field crews to sample high mountain lake water. As the Aquatic Ecologist for the Klamath Inventory and Monitoring Network in southern Oregon, he's found a way to connect his career with his passions. He leads the monitoring of water quality and aquatic communities in streams and lakes for the network, which includes two high elevation parks: Crater Lake and Lassen Volcanic National Parks.

## Early Years

Growing up in a small southern California town, Dinger's family had many happy adventures backpacking in the Sierra Nevada mountains that towered above them. Those times in the mountains were formative to him. He also knew that he wanted to be a biologist since his first high school AP Biology class.

"It was cellular and molecular-level biology. I found the intricacies fascinating."

## Education

He began college at UC Riverside with an interest in reptiles and ocean life. But a simple twist of fate (or two) shifted his thinking. First, the summer after his freshman year, working as a camp counselor on Catalina Island, he watched a miserable, dry-heaving camp counselor get whisked off by helicopter to the hospital after a rattlesnake bite. That ended his herpetology interest right there. And second, after transferring to UC Santa Barbara, his first field lab course introduced him to freshwater biology in a lake in the Santa Barbara Mountains. Once he realized he could study aquatics in his beloved mountain landscapes, there was no turning back. He promptly left the world of marine biology behind.



Eric Dinger on the trail in the Kashmir region of Pakistan, 2008.

During his undergraduate studies, Dinger did volunteer lab work identifying insects. Soon after graduating, he was hired by Sierra Nevada Aquatic Research Lab (SNARL) as an entomologist. With the lab, he collected aquatic insects in mountain streams of the Eastern Sierra Nevada mountains. This introduced him to the concept of bioassessment sampling, where the abundance and variety of stream insects is used to indicate stream health. This aquatic insect thread would continue throughout his career.

Dinger eventually went on for his PhD at Northern Arizona University, graduating in 2006. During those years, his focus narrowed down to the microscopic world of aquatic insects, and he became even more

expert at identifying stream bugs. But other experiences also propelled him outwards for two international stints. He researched modern, living stromatolites in a unique wetland area



Collecting aquatic insects on the Arkansas River in Colorado for the National Aquatic Monitoring Center.



# Eric Dinger *(continued)*

of Mexico called Cuatro Ciénegas, which translates to “four marshes.” These unique wetlands harbored a wealth of endemic aquatic life, including an aquatic box turtle that evolved over time from living in the water to living on land and then back to living in the water. He also had the opportunity to spend a week in Pakistan with a team of hydrologists and other scientists. They were consulting for the Pakistani government to understand downstream impacts to Pakistan from proposed water diversions in the Kashmir region upstream in India.

## Career

After a few years bent over the microscope as an aquatic macroinvertebrate taxonomist with the National Aquatic Monitoring Center (the “USU Bug Lab”), Dinger applied for his dream job in Ashland, Oregon, with the Klamath I&M Network. “There is only so much sitting at a microscope that you can do...” The network hired him in 2008 and he’s been here ever since.



Identifying aquatic insects at the National Aquatic Monitoring Center (“USU Bug Lab”).



Dinger in a small town in the Kashmir region of Pakistan, with the Karakoram Mountains looming behind. He was visiting as a consultant on the impacts of a potential water diversion of the Neelum River in 2008.

Dinger’s job entails a wide variety of tasks, all related to helping park managers understand the health of their streams and lakes. While he is busy year-round, spring and summer are his “crunch time.” From hiring and training crews, collaborating with parks on logistics and safety for his crews, as well as ordering supplies, it’s the time to do that most essential task of monitoring: collect data. The crews scour the streambed or lakeshore to collect stream insects, immerse high-tech water probes to measure water quality, survey for amphibians and fish, and measure stream or lakeside vegetation. The tools of the trade require anything from forceps and a fine mesh net, to laser rangefinders (to measure riparian forest tree heights or distance to opposite shore), to a \$10,000 electroshocking backpack unit. Being out in the parks to train his crews is a real source of joy:

“The highlights of this job are being out in the field and shouting at my crewmembers over the roaring water, teaching them how to do stuff. And then seeing them take it and do it as

well or better than I was. And knowing that the monitoring is in good hands. And I can leave them to their own devices and I will get quality data from them. Those are the joys of my job. Being outdoors and teaching people.”

Dinger’s “quiet time” comes at the end of field season. Fall and winter keep him busy analyzing data, writing reports, and writing proposals for side projects and funding. A good example was funding he obtained in collaboration with Whiskeytown NRA managers to do some extra stream sampling after the Carr Fire ravaged 97% of the park. The data his crews were able to collect immediately after the fire will help inform park management decisions. Another focus of his quiet time is data analysis. Thanks to his statistical chops (refined in graduate school), he does much of the complicated analyses required for status and trend reporting of network vital signs. Lately, this means using statistical analysis to answer questions like, *Can we sample fewer sites or sample them less often without losing our power to detect change?* or, *How*



# Eric Dinger *(continued)*



Preparing aquatic insect samples for shipment to the lab at the end of field season.

*might cave wall bacteria communities respond to the experimental use of UVC light to destroy the fungus that causes white-nose syndrome in bats?*

## Challenges and the Future

Some of challenges of the job are physical—sampling in hot, muggy, buggy environments. He recounts one painful memory of “...working in the deserts of Mexico where you had Naucorids, a type of water bug, that would love to get into your neoprene booties and bite you between the toes. That was just constant – biting bugs,”

Other challenges of his work are more abstract. For example, the tension between consistency vs. flexibility in monitoring can be frustrating. Long-term monitoring takes time, consistency, and a majority of the network’s budget. At the same time, parks still have short-term emerging issues and management questions that could not be anticipated and are not specifically addressed by long-term monitoring data. Despite the challenges, Dinger has actually been able to provide some help to parks outside the normal long-term monitoring routine. One example is working with Whiskeytown NRA managers to assess the damage from flooding of Crystal Creek after the emergency bypass system was activated at an inopportune time. His

lakes crew was able to add some extra sampling into their field season to collect the needed data.

What has been the most meaningful part of his job? A couple of themes emerge. Human interactions have been a highlight for him, from the experience of working closely with Mexican biologists, to a strange encounter during fieldwork in the middle of the desert with two musicians who became good friends, to mentoring individual field crewmembers through their early careers. He still keeps in touch with several of his past employees. He’s also excited to help drive the evolution of the Inventory and Monitoring Division in its constant efforts to better serve park managers. He notes that since the program’s origins with strictly defined monitoring protocols, I&M scientists have increasingly found ways to meet specific park

needs while maintaining consistent long-term monitoring, even though it’s not an easy balance to strike. He’s especially excited to design and carry out science that helps parks continually learn about lake and stream habitats. He hopes that “40 years from now we are still in this learning process and that we never stop learning. It’s the compounding interest of knowledge.”

## Joys

Outside of work, Dinger finds his fun back at high elevation for adventures like rock climbing and mountaineering. But fun also revolves around his family. He talks fondly of “...turning rocks over in the streams with my 8-year-old daughter. And just enjoying watching her pick flowers for her mother. Wanting to find that big rock in the middle of the stream that she can sit on and just listen to the noises of the forest.”





# Awards



**Congratulations to Jen Hooke**  
—winner of the 2018 Regional and National Directors' Awards for Natural Resource Management.

Jen Hooke, Botanist at Crater Lake National Park, transformed Crater Lake's botanical program into an

effective professional program focused on science, management, and restoration during her nine-year tenure. Examples of this program include developing and implementing a Whitebark Pine Conservation Plan in collaboration with the US Forest Service and creating an invasive species management plan, which has led to the park-wide eradication of 20 invasive plant species. Further, Jen led restoration of disturbed areas and developed the park's first full nursery program that collects and grows local seed stock for restoration projects. In addition, Jen served as the Lead Resource Advisor (READ) for the park while developing a READ guide for resource protection during wildfires which is also being used as a template for several other parks.

Jen's colleagues at Crater Lake National Park value her ability to find funding for seasonal field staff year

after year to carry out her plans. As Sean Mohren puts it, "Developing plans is great, but if you can't implement them then what is the point....Jen has shown not only is she capable of assessing the needs of the park and putting them into a plan, but also making sure that the plan is implemented throughout the park." Sean Smith, botanist with the Klamath Network, appreciates Jen's contributions to scientific understanding of whitebark pine through the peer-reviewed journal articles she has coauthored.

Jen describes what she loves about her job: "I started working for the NPS when I was 22, and that opportunity has given me purpose, inspiration, and community. I am incredibly grateful to have a career where I can help protect our natural resources and continually learn from being outside."



**Congratulations to Sonya Daw**  
—winner of the Inventory and Monitoring Division 2019 Communication Award.

*In the nominators' words:* "What makes Sonya Daw outstanding in her work is her ability to build relationships with network staff, Research Learning Centers, park resource managers, interpreters, education specialists, and local communities. She attends park meetings, stays informed of park events, and consistently represents Inventory & Monitoring in a way that emphasizes both helpfulness and science expertise." ... Her monitoring briefs "keep park staff connected to I&M science[, such that park staff] have even started using "vital signs" terminology during their presentations and tours." And finally, "Sonya is cultivating the next generation of science communicators. She has recruited and mentored six English and Environmental Education students at Southern Oregon University (over two years),

coaching them on writing science communication articles based on Klamath Network activities. She supported two GIS classes at SOU to describe vital signs monitoring results through Story Maps, and has explored how to contribute to Frontiers for Young Minds (a youth science journal) for the Greater Yellowstone Network."

Sonya describes what she loves about her job: "I love creative outreach projects. It's very satisfying to put a whole communication package together, from initially brainstorming who needs the information and why, to finding great images, to crafting the sentences and writing style. Likewise, I enjoy scratching my attention-to-detail itch in editing technical reports. I'm just lucky to have such a diverse job and to work with a wide variety of dedicated people who love nature and science as much as I do!"



# Partnering with the Cascade-Siskiyou National Monument

The Klamath Network is helping neighboring Cascade-Siskiyou National Monument, (administered by the Bureau of Land Management) to establish long-term vegetation community monitoring. Considering how much time and effort go towards designing a solid monitoring protocol, why reinvent the wheel? Klamath Network botanist Sean Smith is collaborating with monument ecologist Charles Schelz to monitor plants, using the network's existing terrestrial vegetation monitoring protocol.

The Cascade-Siskiyou National Monument in southern Oregon, just outside of Ashland, protects over 100,000 acres of wetlands, lakes, streams, grasslands, oak savannah, oak woodland, and mixed-conifer forest. It spans 4000 feet of elevational change from its lowest to its highest point at 6100 ft. It was established in 2000 as the first protected area ever set aside specifically to preserve biodiversity. Though various projects have surveyed select plant communities over time, no systematic long-term monitoring has yet been put in place.

A crew from the Klamath Network has been establishing vegetation plots in oak and mixed-conifer habitats throughout the monument. These plots will be resampled every 3 years to track conditions over time. Schelz sees the monitoring as essential,

“The monument is set aside to preserve the area's exceptional biodiversity. We need to monitor vegetation to track the health and diversity of our plant communities, which are the foundation for many ecological processes. It also provides us the opportunity to compare what's going on in the monument with regional trends.”

One advantage to the Klamath Network from this collaboration is adding data collected in the same way to their own growing dataset of plant community conditions in the region's other national park units. This opportunity to analyze the condition of plant communities at a regional level makes the analyses more powerful.

This collaboration with the Cascade-Siskiyou National Monument adds yet another partner to our network of collaborators. By sharing data, protocols, and analyses, partnerships can boost the power of what we learn together about park ecosystems and the health of surrounding ecosystems.



Austin Waag is one half of the 2-person crew setting up vegetation plots in the Cascade-Siskiyou National Monument. The crew will likely do some bat work and whitebark pine monitoring as well.



Maya Pendleton is the other half of the 2-person crew setting up vegetation plots in the Cascade-Siskiyou National Monument. The crew will likely do some bat work and whitebark pine monitoring as well.



# Where Are They Now?

The Klamath Network works with a variety of interns to support our program and to offer educational experiences. Interns may find themselves sampling water quality, monitoring whitebark pine, identifying native plants, mist-netting bats, or writing about our science. We highlight where our interns have landed professionally or educationally in this new “Where Are They Now” section of our newsletter. In this newsletter, we feature

## Debra Agnew

### Klamath Network position:

Science Communication Intern, 2019

### Current job:

Science Communication Specialist  
Klamath Bird Observatory  
Ashland, Oregon

Debra wrote the popular Featured Creature article on [California Groundcone](#) for her internship with us. After graduating from Southern Oregon University with an M.S. in Environmental Education, she worked this past winter in outreach for Crater Lake National Park, and just recently



landed a job with the Klamath Bird Observatory. Here's how she describes her work:

“I am responsible for facilitating communications about Klamath Bird Observatory’s science within our organization and between partner organizations, and for communicating our science with the

public via websites, social media, and community education programs. I enjoy merging scientific writing and creativity to connect with a vast network of scientists, conservation practitioners, and bird-enthusiasts, and knowing that my work supports conservation science that benefits birds, their habitats, and people.”

## Recent Publications

Available from the Klamath Network website: <https://www.nps.gov/im/klmn/reports-publications.htm>

### Vital Sign Update Briefs

- [Vital Sign Update: 2019 Results for Vegetation Community Monitoring at Crater Lake National Park](#)
- [Vital Sign Update: 2019 Results for Vegetation Community Monitoring at Oregon Caves National Monument](#)
- [Vital Sign Update: 2017 Results for Streams Monitoring at Lassen Volcanic National Park](#)

### Science Communication

- Featured Creature natural history articles on [Giant Water Bug](#), [Pacific Poison Oak](#), [Sandhill Crane](#), [Short-eared Owl](#), [White Alder](#)



# 2020 Field Schedule at Klamath Network Parks, Modified by COVID-19 Safety Considerations

Vital Signs Monitoring	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Landbirds—Mist Netting (KBO) (KLMN contact—A. Chung)			ORCA - postponed until 2021						
Landbirds—Point Counts (KBO) (KLMN contact—A. Chung)			LABE - postponed until 2021						
			RNSP - postponed until 2021						
Invasive Species (KLMN—S. Smith)			Next field season in 2021						
Vegetation (KLMN—S. Smith)			LABE - postponed until 2021						
				RNSP - postponed until 2021					
Whitebark Pine (KLMN—S. Smith)				LAVO - tentatively on track					
				CRLA - tentatively on track					
Streams (KLMN—E. Dinger)			WHIS-postponed until 2021						
					LAVO-postponed until 2021				
Lakes (KLMN—E. Dinger)			Next field season in 2023						
Rocky Intertidal (UCSC) (KLMN contact—E. Dinger)			RNSP						
Caves (Park staff)	LABE - Summer monitoring by park staff scaled back								
	ORCA - Ongoing data collection by park staff, with minor adjustments								

## Park acronyms

Crater Lake National Park (CRLA), Lassen Volcanic National Park (LAVO), Lava Beds National Monument (LAGE), Oregon Caves National Monument and Preserve (ORCA), Redwood National and State Parks (RNSP), Whiskeytown National Recreation Area (WHIS)

## Cooperator acronyms

Klamath Bird Observatory (KBO), University of California at Santa Cruz (UCSC), Southern Oregon University (SOU)

## Klamath Network Vital Sign Project Contacts

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- Rocky Intertidal Zone

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- Land Cover and Land Use
- Alice Chung-MacCoubrey · 541-552-8575
- Landbird Communities, Caves, Bats

Sean Smith (541) · 552-8570

- Terrestrial Vegetation
- Exotic, Invasive Plants
- Whitebark Pine

