



The Klamath Kaleidoscope

Where We've Been and Where We'd Like to Be

By Daniel Sarr, Klamath Network

In July 2010, the Klamath Network underwent its Three Year Program Startup Review in Medford, Oregon. The Program Review, attended by delegates from all six parks in the Klamath Network, along with scientists from the Klamath Bird Observatory, Southern Oregon University, and USGS, provided an excellent opportunity to review the Network's progress and to share ideas for its improvement. The following quote from the Klamath Network Program Review Report (Fancy et al. 2010) captures the general view of the Network's progress to date:

"There was a consensus among the review panel members and all of the superintendents, park resource managers, and other park staff and collaborators who attended the review or responded to the anonymous online survey that the network is off to an excellent start. The network and park staff have worked together to design and implement a program that is valued by all of the parks and meets the goals and standards of the I&M Program. The accomplishments and productivity of the small network staff to date has been impressive. Excellent progress has been made in establishing the infrastructure and procedures for effective data management, data analysis, reporting, and delivery of results to parks. The data management systems and procedures are top notch, and this is one of the strongest components of the network's efforts..."

It is great to hear that we are off to a strong start! Although the Review was generally positive, the panel recommended that the Klamath I&M team consider some changes in the upcoming years to better meet its workload and convey the key findings to the parks. Specifically, the attendees and review panel recommended that the Network increase the proportion of permanent employees, better engage the parks in collaborative monitoring of invasive species, consider placing some Network staff in parks, and conduct a series of "I&M Road Shows" in each of the parks to better connect with all those park staff who rarely attend centralized meetings.

The full report can be accessed at: http://science.nature.nps.gov/im/units/klmn/Meetings/Program_Review/Report-KLMN_Startup_Review.pdf

In winter 2010-2011, Klamath Network staff will be developing a five year strategic plan for the I&M Program. In the plan, the Network will be evaluating its strategies for staffing, training, park involvement, operations, partnerships, information management, and science communication. We will likely be coming to your park in the next year to inform you of our progress and get you involved in setting the goals for the implementation phase of our program. After all these years of development, it will be exciting to see you all while out monitoring the vital signs of the Klamath Network!



National Park Service
U.S. Department of the Interior

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

**Klamath Network
Inventory and Monitoring Program**

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Mailing List

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The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

Dwarf Alpine Hawksbeard (*Crepis nana*) – A First Time Collection from Lassen Peak! By Sean Smith, Klamath Network

While sampling Lassen Peak, as part of the vegetation mapping effort, we observed an unknown plant. It didn't fit the description of any species in the Flora of Lassen, and without proper magnification, the *Jepson Manual* was of no use. What could this species possibly be? Upon returning to the Ashland office, I was able to identify the unknown species as Dwarf Alpine Hawksbeard (*Crepis nana*). Here, I hit another obstacle: the physical characteristics fit but the distribution did not. It seemed the species was out of place on Lassen Peak. The only collections of *C. nana* in California were from the central/southern Sierra Nevada and the desert mountains near Death Valley. Further research revealed the species occurs at high elevations/latitudes on gravely substrates in western North America. So the habitat and ecology from Lassen Peak were a pretty good fit. And as a final reference, images of *C. nana* were examined and, Ah hah! Indeed, we had discovered a new species to Lassen Volcanic NP. The distance from the Lassen locality to the nearest collections ~150 miles to the southeast (Sonora



Dwarf alpine hawksbeard growing on Lassen Peak (top) and in detail (bottom).

Pass in California) and hundreds of miles to the north (the Willowa Mountains in Oregon and the Olympic Mountains in Washington) make this a noteworthy collection. As a member of the Chicory tribe, *C. nana* seeds are similar to a dandelion's and dispersed primarily by the wind. The most likely method for introduction to Lassen would have been a "fuzzy" *C. nana* seed riding the breeze and then making a serendipitous landing on the island in the sky we call Lassen Peak. As the population of *C. nana* on Lassen Peak is >30 individuals, the introduction likely occurred several years ago.



Meet Jenny Mensch, the Klamath Network's New Water Quality Interpretation Intern!

Jenny Mensch, a new Environmental Education graduate student at Southern Oregon University, joins the Klamath Network to work on water quality interpretive material for the parks. Hailing from Illinois, Jenny recently received her Bachelor's of Science degree in Conservation and Environmental Science from University of Wisconsin, Milwaukee. She has also served as an environmental education intern at the Wehr Nature Center in Franklin, Wisconsin. She will be working with Dr. Eric Dinger (as a technical advisor), Dr. Daniel Sarr, and the interpretive chiefs on designing useful products to assist in the interpretation of current water quality data as part of the Klamath Network Strategic Interpretive plan. Welcome, Jenny!

Lava Beds National Monument: Pilot in a Resource Stewardship Strategy

By Heather Rickleff, Lava Beds National Monument



Participants discuss the Resource Stewardship Strategy components at workshops Lava Beds National Monument.

RSS Pilot

In the past, the NPS used the Resource Management Plan to provide in natural and cultural resource management. Now, we are moving from this type of plan to a Resource Stewardship Strategy (RSS). Lava Beds National Monument is one of 23 pilot parks to test the implementation of this new park program plan and the first of the Klamath Network (KLMN) parks.

What is a RSS?

The RSS is based on long-term scientific and scholarly information and will address the next 20 year management timeframe. It identifies and provides descriptions of what would be necessary to achieve and maintain healthy natural and cultural resources. The RSS also provides a logical timeframe for implementing the sequence of potential activities needed in order to meet desired conditions of natural and cultural resources, as established in the park's current General Management Plan.

Where to start?

A General Management Plan provides direction and leads the RSS into strategic planning. A park's foundation statement is an ideal starting point for the RSS, as it identifies the park's fundamental resources and values (FRV). The RSS begins with each resource (e.g., lava tube cave environment) and identifies if knowledge of that resource is adequate enough to develop attributes, indicators, targets, and a strategy, or if a strategy should be developed to acquire the necessary information to establish indicators, targets, and strategies.

Who is involved?

The Lava Beds RSS has four teams: Core, Extended, Subject Matter Experts, and Expert Review. The Core, Extended, and Subject Matter Experts are involved throughout the entire process. All teams, with the exception of the Expert Reviewers, come together for two workshops: Indicators and Targets and Comprehensive Strategies.

KLMN I&M staff have provided valuable input and participated as team members. Lava Beds and the KLMN I&M have recognized the importance of collaborating and striving to fill knowledge gaps without duplicating efforts. Additionally, Lava Beds is working closely with the Natural Resource Condition Assessment team to assess high priority topics identified by resource managers, while not duplicating efforts from I&M or the RSS.

Lava Beds Progress

Lava Beds has successfully completed both workshops for natural and cultural resources and is now in organizing potential activities into broader categories of strategies, budgets, and chapter completion. All activities for each FRV will be categorized under the same six strategies: management and mitigation, base knowledge, monitoring resources, data management, collaboration and partners, and education and communication. For example, the Lava Tube Cave Environment FRV has an activity to "update existing cave lighting in Mushpot Cave to improve efficiency and minimize impact on cave resources." This activity will fall under the "management and mitigation" strategy. Many activities will have an associated, measurable indicator and target. Lava Beds plans to have a draft ready for review in early 2011 by the Expert Review team to ensure the currency and consideration of this scientific and scholarly information before finalization.

Please contact Heather Rickleff at heather_rickleff@nps.gov if you have any questions about the RSS at Lava Beds.

Index of Ecological Integrity

By Eric Dinger, Klamath Network

The Klamath Network aquatic monitoring efforts for the past summer were spent sampling 80+ lakes in and around Lassen Volcanic National Park. The goal for this monitoring activity was to collect data for developing an Index of Ecological Integrity (IEI), using the protocol developed to sample Klamath Network Mountain Ponds and Lakes.

An IEI is essentially a scorecard that combines multiple indicators of ecosystem condition into a single numerical value to rate the condition of the ecosystem. Because an IEI can use measures of biodiversity, nutrient chemistry, algal biomass, and physical factors, it results in a robust assessment.

The sampling was accomplished by three key field crew members: Charles Stanley, the field crew leader (returned from the Stream Pilot Project last summer); Emmy Johnson, who had sampled lakes in Sierra/Kings Canyon; and Christopher Allen, who had just finished monitoring sea turtles for Padre Island National Seashore. Additional help came from Nathan Cullen and Casey Smith, seasonal LAVO employees, as well as our own Bess Perry.

Together, they sampled lakes both in the park and outside the park on Lassen National Forest lands. By sampling on the National Forest, they collected data on lakes subject to multiple resource use levels, more than found in the Park Service



IEI field crew, summer 2010: From left to right – Charles Stanley, Casey Smith, Emmy Johnson, and Christopher Allen.

lakes. Having this gradient of disturbances is vital to developing the IEI. They collected data in the field on water quality, amphibians, fish, and physical habitat, and samples for water chemistry, zooplankton, macroinvertebrates, and algal biomass. Samples are still being analyzed by contract laboratories, with results expected by February or March.

Overall, it was an extremely successful field season. In addition to collecting data for the IEI development, the season served as an extended pilot project, since the Klamath Network Mountain Ponds and Lakes protocol is still in revision. It also provides a large amount of baseline data prior to protocol implementation. Furthermore, the sampling on Forest Service land facilitated many connections with both the California Fish and Game personnel and Forest Service managers to spark future collaborations.

Pictured below are two lakes sampled during this study: At left is one of the Cluster Lakes in Lassen Volcanic National Park and at right is Willow Lake in Lassen Volcanic National Forest.



Klamath Network Recent Events

- ⊗ Finalized the approved the KLMN Invasive Species Early Detection Protocol
- ⊗ Held the KLMN Programmatic Three Year Review
- ⊗ Daniel Sarr presented an Invasive Species Early Detection poster at the Ecological Society of America conference
- ⊗ Finalized the approved Vegetation Monitoring Protocol
- ⊗ Wrapped up projects with Redwood and Humboldt State University graduate students in the Little Bald Hills
- ⊗ Submitted all task agreements and contracts for FY2010
- ⊗ Submitted the 2010 KLMN Annual Administrative Report
- ⊗ Attended the Lava Beds RSS meeting workshops (see article in this newsletter)
- ⊗ Organized a forest monitoring field trip with the USGS to Whiskeytown and Lassen Volcanic
- ⊗ Attended a Klamath Bird Observatory conference on birds and climate change

Klamath Network Upcoming Highlights

<u>Project</u>	<u>Parks Included</u>	<u>Status</u>
Inventories		
Vegetation Mapping	CRLA, LABE, LAVO, ORCA, REDW	CRLA-scoping for mapping, Field work in summer 2011; LABE-70-80% of field work completed in 2010, to continue in FY 2011; LAVO-in final stages; ORCA-field work done, classification and map development underway; REDW-in final stages
Monitoring		
Intertidal	REDW	Field sampling in December 2010, June 2011; Third annual report in review
Invasive Species Early Detection	All KLMN Parks	ISED protocol will be implemented in all parks in FY 2011 and briefings distributed in December 2011; Second ISED Annual Report complete by March 2012
Vegetation	All KLMN Parks	Protocol was revised and resubmitted for final approval in October 2010; First field season will commence in summer 2011 in LABE and REDW
Landbirds	All KLMN Parks	Protocol was finalized in January 2010; Landbird monitoring will be conducted in CRLA, ORCA, and LAVO in 2011; Third annual report and the monumenting report will be completed in FY 2011
Water Quality and Aquatic Communities-Lakes	CRLA, LAVO, REDW	The protocol was submitted for peer review in December 2009, review received, and protocol scheduled for resubmission by February 2011
Water Quality and Aquatic Communities-Streams	CRLA, LAVO, ORCA, REDW, WHIS	The protocol was submitted for peer review in May 2010, and we are awaiting peer review comments.
Whitebark Pine	CRLA, LAVO (Collaborative development with SIEN, UCBN)	A draft protocol was completed and submitted for peer review in FY 2010. Revisions and finalization will occur upon receipt of review comments.
Land Cover / Land Use	All KLMN Parks	Will be working with park staff and WASO to develop draft protocol
Caves	LABE, ORCA	Protocol was submitted in August 2010, peer review comment received October 2010, and the protocol scheduled for resubmission in June 2011.
Science Communication		
Strategic Interpretive Plan	All KLMN Parks	In FY 2011, KLMN began an interpretative project about Water Quality with Jennifer Mensch, Southern Oregon University (SOU) graduate student; In FY 2010, the KLMN began research on an interpretive manual about wetlands with SOUgraduate student Sarah Finstad, which will be completed in FY 2011; Both interpretive projects are being conducted under the mentor ship of Dr. Stewart Janes, Director of the Environmental Education degree program at SOU.
Resource Briefs	All KLMN Parks	The KLMN staff will continue to prepare resource briefs through FY 2011
Park Presentations	All KLMN Parks	In FY 2011, the KLMN staff intend to provide in-park presentations for each park to showcase the program and to answer questions
Science Support		
Resource Stewardship Strategies	LABE	Daniel Sarr, Dennis Odion, Sean Mohren, and Sean Smith assisted with scoping meetings for the LABE RSS Process. They will continue to stay involved, as needed in 2011.
Natural Resource Condition Assessments	All KLMN Parks	Will assist as requested with pilot study in REDW, ORCA, and WHIS, and new project in CRLA, LABE, and LAVO.

Vernal Pools: A Rare Ecosystem in Lassen Volcanic National Park

By Ayzik Solomeshch, Department of Plant Sciences, UC Davis

During a 2009-2010 vegetation survey in Lassen Volcanic National Park, initiated by the Klamath Network, we found many remarkable things, including vernal pool plant communities. This type of plant community has not yet been reported for this area (Figure 1), making it an exceptionally interesting find. Vernal pools are seasonal wetlands that fill and dry each year, formed in a shallow depression underlain with a water-impermeable layer (Figures 2 and 3). Lassen Volcanic National Park is part of the Modoc Plateau vernal pool region, which has the highest elevation (>2000 m above the sea level) and the coldest climate in comparison with all other California regions that support vernal pools. It belongs to the Great Basin Floristic Province, whereas the majority of California vernal pools are part of the California Floristic Province. Vernal pools in northeastern

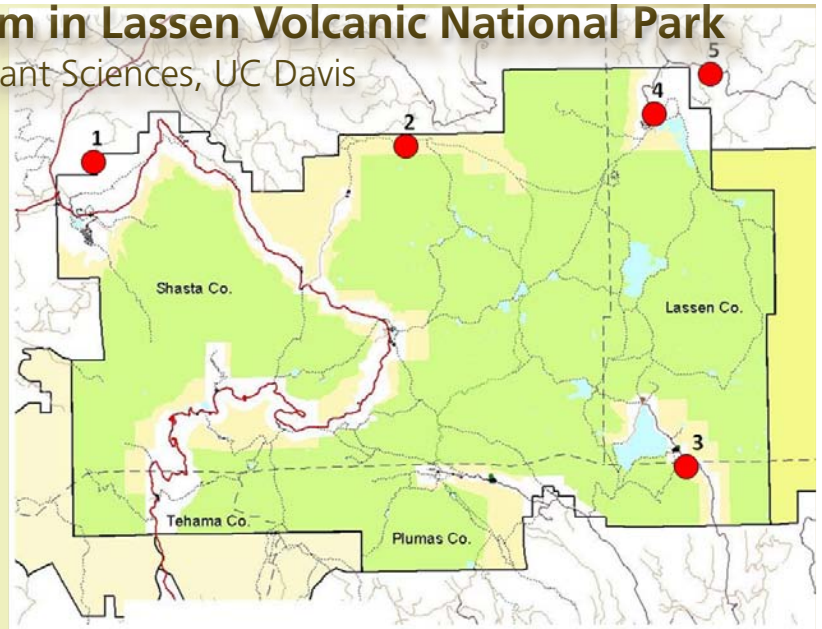


Figure 1. Location of vernal pools in Lassen Volcanic National Park: 1 - Table Mountain; 2 - Badger Flat; 3 - Juniper Lake; 4 - Butte Lake; 5 - Northeastern pool outside the park boundary.

California have remained largely un-documented; the data collected during this study form a valuable contribution to understanding vernal pool diversity. Several species that we found in Lassen pools (*Deschampsia danthonioides*, *Eleocharis macrostachya*, and *E. acicularis*) are common in most California vernal pools. Floristic distinctiveness of these pools from the rest of California pools is indicated by the presence of such endemic taxa as *Porterella carnosula*, *Downingia bacigalupii*, *Eryngium alismifolium*, *Navarretia leucocephala* ssp. *minim*, and *Polygonum polygaloides* ssp. *confertiflorum*. They also differ from most California vernal pools in that they are more natural and less invaded by non-native species, which are unfortunately abundant in lower elevation pools.



Figure 2. Lassen Volcanic vernal pools dry down in June-July. This is an optimal time for plant growth because the standing water is gone, soil is still moist, and the weather is at its warmest. Dominant plants on the right image are: *Eleocharis macrostachya* (green) and *Porterella carnosula* (blue).



Figure 3. Vernal pools dry out completely in August-September. Their soil has cracks; most vernal pool plants set seeds and die. Dominant plants on the right image are: *Deschampsia danthonioides* (yellow), *Polygonum polygaloides* ssp. *confertiflorum* (brown), and *Navarretia leucocephala* ssp. *minima* (whitish).

Our data show that pools found in Lassen Volcanic and its vicinity are good representatives of Modoc Plateau vernal pools. Over 90% of California vernal pools have been destroyed and none of the remaining pools have as high a level of protection as the National Park Service can provide. The diversity of vernal pools within the park and especially in the areas adjacent to the park need further study. This knowledge can be incorporated in the management strategy to support sustainable existence of biodiversity of the Modoc Plateau region.