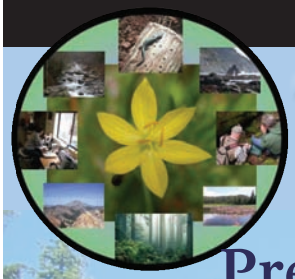
Newsletter

National Park Service
U.S. Department of the Interior



The Klamath Kaleidoscope

Preservation and Change in Park Ecosystems

By Daniel Sarr and Dennis Odion
Klamath Network and Southern Oregon University

A key challenge of park monitoring is defining what changes in park ecosystems are acceptable. A recent article by Cole et al. (2008) in the George Wright Forum provides an insightful analysis of this question. The guiding principle for park stewardship is laid out in the Organic Act of 1916. The Park Service is to:

"... promote and regulate the use of the...national parks...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
(National Park Service Organic Act, 16 U.S.C.1)

This has traditionally been interpreted to mean that conditions remain stable and unaffected by humans. However, a paradigm shift in ecology occurred in recent decades, leading to recognition that nature's complexity is shaped and maintained inexorably by dynamic processes. Pickett and White (1985) described the park management conundrum with uncanny precision:

"An essential paradox of wilderness conservation is that we seek to preserve what must change."

With paleoecological, fire history, and archaeological studies, we are only now coming to an understanding of some of the natural dynamics in park landscapes. We have also learned firsthand that natural disturbances such as the Yellowstone Fires can completely transform overnight even the largest park landscapes. Additionally, we have recognized that the notion that park ecosystems are unaffected by humans is unrealistic. An initial period of naïve confidence in the stability and insularity of the parks was deflated as early as the 1930s by the studies of George Wright and his colleagues. They illustrated declines in native species, especially predators, as well as introductions of exotic plants and animals, and impacts from roads. More recently, the effects of fire suppression, excess fire due to human ignitions, and climate change have become increasing concerns.

As a public land management agency, evaluations of the effectiveness of our management are inevitable. Such assessments of management naturally depend upon benchmarks about the composition, structure, and function of park ecosystems. The vital signs monitoring program can provide valuable information about the status of current ecosystems. Unfortunately, there is no guarantee that current benchmarks will provide an adequate measure of "unimpaired" ecosystems. We may need to recognize that many of our perceptions of what is "natural" in a park are only approximations shaped by a too-short period of observation. Our preservation mission may need to be reinterpreted to provide a more flexible view of park dynamics. It also seems clear that we will not be able to conserve many elements of the park ecosystems by focusing solely within NPS boundaries. To meet our conservation mission in the parks, we must look outside and invite others to help. We already recognize the importance of partnerships for migratory bird conservation, such the Partners in Flight Bird Conservation Initiative. Development of similar conservation agreements for other elements of park biodiversity would seem to be a critical goal for preserving parks unimpaired, for future generations.

Cole, D., L. Yung, E. Zavaketa, G. Aplet, F. Chapin, D. Graber, E. Higgs, R. Hobbs, P. Landres, Co. Millar, D. Parsons, J. Randall, N. Stephenson, K. Tonnessen, P. White, and S. Woodley. 2008. Natural areas and beyond: Protected area stewardship in an era of global environmental change. George Wright Forum 25(1):36-56.
Pickett, S. T. A., and P. S. White. 1985. The ecology of natural disturbance and patch dynamics. Academic Press, Orlando, FL.

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
1250 Siskiyou Boulevard
Ashland, Oregon 97520-5011

Website
http://science.nature.nps.gov/im/units/klmn/index.cfm

Phone
(541) 552-8575

Editor & Designer
Bess Perry

Contributors
Klamath Network Staff and Research Partners

Photographers
Title page: Aspen grove at Lassen Volcanic National Park, by Sarah McCullough. Other known photographers listed in captions.

Mailing List
Please pass this newsletter on to all who are interested. To be added or removed from the mailing list, please contact Dan_Sarr@nps.gov.

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

New Species Documented at Oregon Caves National Monument

By Sean Mohren, Klamath Network

For the past several years, the Klamath Network has been partnering with the Klamath Bird Observatory to inventory and monitor bird communities throughout the parks in our Network. As part of this effort, a mist netting station has been setup at Oregon Caves National Monument to help us meet the objectives of our long-term landbird monitoring project. In September of 2008, the Klamath Bird Observatory was able to document a Northern Waterthrush (*Seiurus noveboracensis*) near Big Tree. The Northern Waterthrush is not a thrush but a small, ground-dwelling warbler that is frequently found near water. The waterthrush is a Neotropical migrant and is usually found enjoying lazy summer days throughout Canada, Alaska, in some of the higher altitudes of the northern Rockies and Appalachian Mountains, and in the northeastern portions of the United States. During the winter, the bird packs its bags and heads south for sunnier days and warmer weather in the tropical mangroves of Central and South America, on the islands of the Caribbean, and throughout Mexico. Unlike a lot of birds, the Northern Waterthrush is territorial in both winter and summer. During the summer, the bird can be heard singing a loud, ringing song to announce its breeding territory. In the winter, the Northern Waterthrush will use a "chink" call along with aggressive behavior to defend its wintering territory. The Network plans on using this finding to update the monument's certified bird species list in the NPS database NPSpecies.

Left: A Northern Waterthrush captured by the Klamath Bird Observatory (KBO) at Oregon Caves. Photo by Robert Frey, Biologist and Banding Program Leader, KBO.
Right: Summer and winter distribution of the Northern Waterthrush. This image was obtained from the NatureServe Explorer on 11/21/2008.

Vegetation Monitoring Pilot Study

By Sean Smith, Klamath Network

Dennis Odion and Sean Smith testing the vegetation pilot study's sampling methodology at a test plot on Mount Ashland. Photo by Sean Mohren.

Vegetation is a major component of terrestrial ecosystems, composing the bulk of biomass in an ecosystem. Further, vegetation serves as food and structure for other life forms and provides fuel for wildfires. Given the importance of terrestrial vegetation, the Klamath Inventory and Monitoring Network selected it as a vital sign to monitor. The objective of terrestrial vegetation monitoring is to determine status and trends in vascular plant composition, structure, and function, with special attention directed to how these features influence wildlife and fuel for wildfires.

With the vegetation monitoring objectives clearly laid out in the Klamath Network Vital Signs Monitoring Plan, we began developing a vegetation monitoring protocol in spring 2008. We relied heavily on existing monitoring protocols developed by the National Park Service Fire Effects Monitoring and Forest Service Forest Inventory and Analysis programs.

In August 2008, we launched a pilot study at Crater Lake National Park to test our protocols. A quick and nimble two person crew hit the ground running and surveyed sixteen 0.1 ha (about ¼ acre) sites in as many days. Dr. Daniel Sarr (Klamath Network Inventory and Monitoring Coordinator) and Dr. Dennis Odion (Researcher, Southern Oregon University) assisted Sean Smith (Klamath Network Seasonal Botanist) in surveying the 17th site, in order to gain a better understanding of work flow and data collection methods. Overall, the pilot study went well; we encountered very few issues with the protocol. Some of the pilot study highlights included near perfect weather, limited mosquitoes, and a riparian site containing 69 species of vascular plants, a botanical delight!

Erigeron perigrinus at Crater Lake during the pilot study. Photo by Sean Smith.

An Assessment of Historical Climate for the Klamath Network Parks

By Christopher Daly, PRISM Group, Oregon State University

Scientists have long recognized that the distinctively complex and biologically diverse landscape of the Klamath region is closely associated with its climatic complexity. From the coastal fogs of Redwood to the deep snows of Crater Lake and arid winds of Lava Beds, climate has shaped the scenery, history, and biological diversity of the Klamath Network parks. Climate change has the potential to strongly affect park ecosystems, and the parks of the Klamath Network are very concerned about the potential effects of climate change on biological elements of interest within their boundaries.

In summer 2008, the Klamath Network Inventory and Monitoring Program provided funding to the PRISM Group at Oregon State University to summarize information for a number of climate stations within and around the parks that have been recording general climatic data for periods ranging from 10 to nearly 100 years. The work, which will occur from 2008-2010, is meant to provide insight into both temporal and spatial patterns and trends in selected climatic parameters both within and around the parks.

A weather station at Crater Lake. Photo by Daniel Sarr.

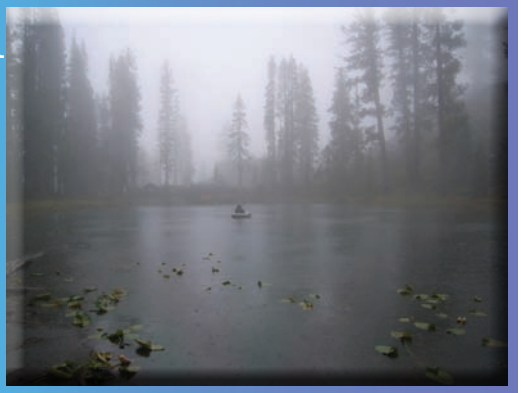
The proposed project aims to address the following objectives:

1. Determine temporal trends in core climatic parameters (e.g., temperature, precipitation).
2. Determine linkages between temporal patterns of temperature and precipitation and temporal and spatial patterns of snowpack within the high elevation parks of the Klamath Network (Crater Lake NP, Oregon Caves NM, Lassen Volcanic NP, and Whiskeytown NRA).
3. Determine spatial and temporal patterns in marine influence at selected climate stations along the Redwood Coast.
4. Construct space-time animations to help park staff visualize and communicate the changing patterns of climate across the park landscapes.

NPS Klamath Network Freshwater Monitoring is Tested!

Aquatic field crew preparing to sample Reflection Lake.
Photo by Aaron Maxwell.

By
Gwyn Myer,
Klamath Network



A wet and rainy day on a nameless pond at Lassen Volcanic National Park.
Photo by Aaron Maxwell.

With the hiring of Eric Dinger as the KLMN Aquatic Ecologist, the Network was ready to begin testing of the Integrated Water Quality and Aquatic Communities protocol in the lakes and ponds of Lassen Volcanic National Park.

A field crew was rapidly assembled, with Aaron Maxwell (a Southern Oregon University graduate student) as crew leader and Gwyn Myer (a recent SOU graduate) as crew technician. The crew met Eric and Bob Hoffman, a USGS Ecologist, for a week of protocol training in the lakes of Lassen.

The pilot project was aimed at testing an integrated protocol for freshwater ecosystem monitoring, including measurement of most trophic levels: phytoplankton productivity, zooplankton, aquatic invertebrates, fish, and amphibians. In addition, the crews made measurements of habitat parameters, water clarity, and water quality – especially nutrient and water chemistry.

The study lasted through mid October, with Aaron and Gwyn hiking out to selected lakes in all areas of Lassen Volcanic National Park. They visited a total of 25 lakes. They spent much of the first week learning, altering, and improving the study methods, and thereafter the work went smooth. The greatest challenge was a simple logistical problem – roughly 120 pounds of equipment was required! Fitting it all into two packs was not a simple task. All in all, we had a few tumbles into the lake edges, some shivering while performing the water chemistry tests, and a few redos due to falling or dropping the samples, but we loved it! We enjoyed learning how to work as a team, were fascinated by the beauty of the park, and were amazed at the variety of lentic habitats within Lassen.

While conducting this work, we were able to understand the importance of the Vital Signs Monitoring Program, and while working with park employees, they expressed their excitement at having the project underway. We look forward to seeing the data we collected used to monitor the aquatic ecosystems of the Klamath Network as we begin the process of determining the status and trends of these resources in the area parks.

Welcome Our New Aquatic Ecologist!

Eric Dinger received a PhD from Northern Arizona University in Biology in 2006, working on the restoration and monitoring of Fossil Creek, Arizona. He also spent considerable time studying aquatic habitats, fish, invertebrates, and stromatolites in the Mexican Chihuahuan Desert. He followed up his graduate work by working in the National Aquatic Monitoring Center, aka the BugLab, at Utah State University. While there, he worked on research focused on the bioassessment and monitoring of western rivers. He has also worked on international aquatic biodiversity issues in México, Africa, and Central Asia.

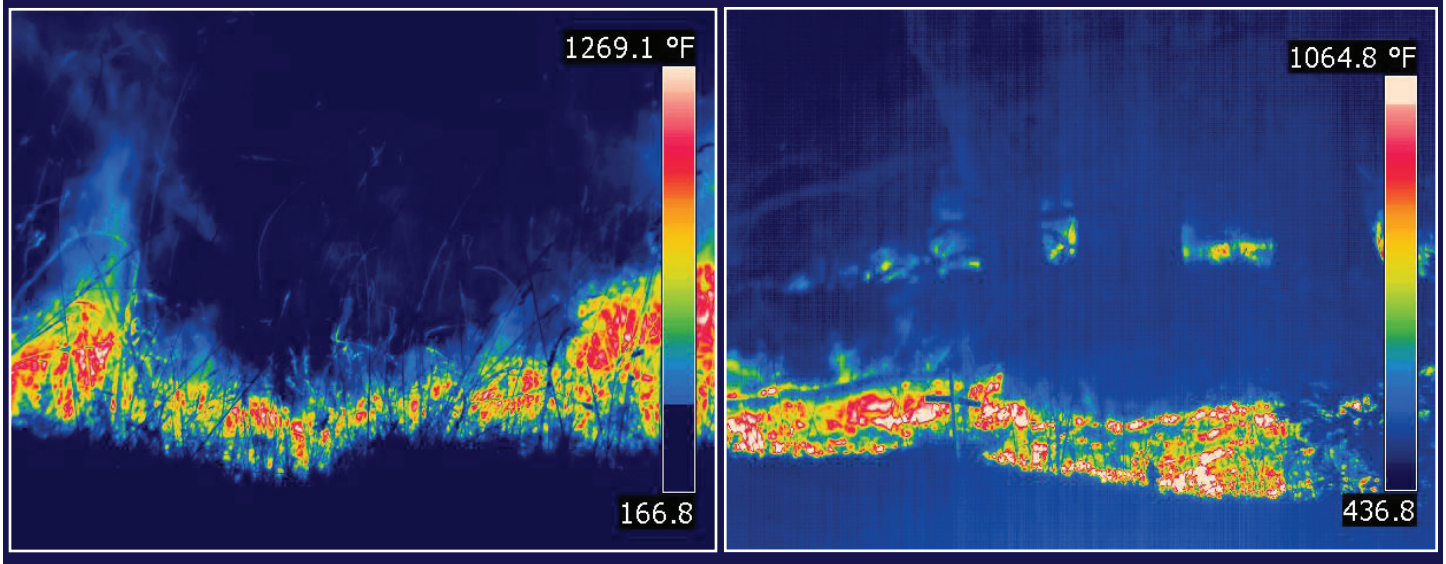
In his spare time, Eric and his wife Nikki are out exploring the Klamath region at high speed, either running or mountain biking. He is also trying to get back to being able to run 100 miles…

HSU's Fire Research in Redwood National Park's Bald Hills

By Eamon Engber and J. Morgan Varner
Wildland Fire Laboratory,
Department of Forestry & Wildland Resources,
Humboldt State University

The Bald Hills of Redwood National Park host the highest plant species diversity in the park and consist of Oregon white oak (*Quercus garryana*) woodlands and open prairies. This distinctive ecosystem was maintained historically by lightning and Native American-ignited fires. Following the advent of fire exclusion in the early 20th century, succession has resulted in the conversion of roughly 25% of prairies and woodlands to Douglas-fir (*Pseudotsuga menziesii*) forest, leading to drastic declines in plant diversity. In the early 1990s, park managers re-introduced fire to the Bald Hills for the restoration and maintenance of the ecosystem; this setting provides a rare opportunity for research in prescribed fire and its effects on ecosystem structure.

In 2008, the Humboldt State University Wildland Fire Lab initiated research that focuses on the role of fire in manipulating oak woodland structure. We are exploring changes in fuelbed properties across different overstory structures, ranging from open grasslands to Douglas-fir-invaded oaks stands. Our goal is to link these fuelbed properties to resultant fire behavior. This fall, we employed pyrometers (temperature-sensitive paint arrays) and a thermal infra-red camera to estimate temperature maxima in prescribed fires. Through this research, we hope to gain a better understanding of the persistence of various oak stand structures within the Bald Hills, the fires that frequent these important ecosystems, as well as characterize and document fuelbed change resulting from Douglas-fir invasion.



Thermal infrared images of prescribed fires in the Bald Hills at Redwood National Park, with temperature scales at right. The left image shows fire in a grassland; the right image was taken in an Oregon white oak clump. This research will help park managers better understand changes in fire behavior and effects in these important ecosystems.

For more information, contact Eamon Engber at eamon.engber@gmail.com

Conserving Biodiversity of the Chihuahuan Desert

By Eric Dinger, Klamath Network

Views of Cuatro Ciénegas, México.

The arid landscape of the Chihuahuan Desert of Northeastern Mexico may be an odd place to find a National Park dedicated to the protection of fish and turtles. But in Cuatro Ciénegas, México – you find just that. I had the rare opportunity to pursue my graduate work, helping the recently formed National Park on a variety of inventory and research topics.

Cuatro Ciénegas, which translates to "four marshes," was given protected status in 1994. Status was afforded through the efforts of a multi-national collective of scientists and activists (and scientist-activists). Officially, it is known as an "Area de Protección de Flora y Fauna" – a protected area for the plants and animals. Like the local Cascade-Siskiyou National Monument, Cuatro Ciénegas was protected for its amazing biodiversity, both aquatic and terrestrial. The numbers of endemic species, those found only in Cuatro Ciénegas, have been compared to that of the Galapagos Islands.

One of these species, the Coahuila Box Turtle – one of three endemic turtles, has been adopted by the local town of 10,000 people as a mascot. The people who work and live around Cuatro Ciénegas have become fiercely supportive of this icon. However, people were also very willing to tell us stories about spear-fishing the local cichlid fish (which was made illegal with the park creation).

The park staff faced an amazing array of challenges – at times, their budget couldn't cover gas for patrolling the park. Likewise, if they did apprehend someone poaching fish, their powers were limited to confiscating the gear. They had no legal authority to prosecute or arrest the individuals.

Klamath Network Recent Events and Upcoming Highlights

July 2008
- Submitted Crater Lake Wetland Inventory Report
- Submitted task agreements and contracts

August 2008
- Conducted Vegetation Monitoring Protocol Pilot Study
- Hired Dr. Eric Dinger as the Network's Aquatic Ecologist

September 2008
- Attended Wildlife Disease Conference
- Conducted Lakes Monitoring Protocol Pilot Study
- Held Technical Advisory Committee Meeting
- Attended Yellowstone Fire Ecology Conference

October 2008
- Submitted Administrative Annual Report and Workplan
- Held Caves Monitoring Protocol Meeting
- Attended SOU Internship/Volunteer Fair

December 2008
- Held Board of Directors Meeting
- Attended Klamath Basin Water Quality Meeting

Winter 2009
- Attending SOU Science Career Fair
- Holding Interpretive Planning Meeting
- Attending George Wright Society Conference

Despite being a "protected area" and being a National Park, the land within Cuatro Ciénegas remains largely privately owned. Raising "wild" horses remains one of the dominant uses of the landscape, and because of the limitations of the park system, it will remain an impact.

Ecologically, Cuatro Ciénegas faces similar challenges to the parks in the Klamath Network. Exotic species, global warming, water extraction, and visitor over-use are all management concerns. The future of Cuatro Ciénegas remains unclear – but optimistic because of the work of the park staff.

Left: Mojarral Oeste in Cuatro Ciénegas.
Right: Coahuila Box Turtle. Photo by Jennifer Howeth.