Klamath Kaleidoscope

Building a Learning Community in the Klamath Network

By Daniel Sarr

John Roth leading field trip at Oregon Caves National Monument

In this Fall 2013 Newsletter you will notice a shift from past years of project development reports and planning to communicating science that is now flowing full force. Despite the challenges of tightening budgets, hiring freezes, and even a shutdown, you will read of three vegetation mapping and classification projects either coming to conclusion or on the home stretch, completion of our first three year cycle of vegetation monitoring, continued landbird, invasive species, whitebark pine, lakes, and intertidal monitoring, and technical assistance for Whiskeytown NRA. It has been another great year working together to learn more about our parks, and from each other.

It is also exciting to see new faces and collaborations. This year, we worked with six interns from Southern Oregon University on various inventory and monitoring projects, as well as several students from Humboldt State University who assisted with whitebark pine monitoring. As we've learned over the last few years, internships provide wonderful learning experiences for students, but also provide flexibility to our field and office-based efforts. Just as important, we learn from one another, and make a darn good team!

This year, three experiences in particular impressed upon me the importance of collaborative learning. In mid July, we held a small meeting between the Klamath Network, scientists from Crater Lake National Park, Humboldt State University, the Sierra Nevada Network, and the Upper Columbia Basin Network at the Crater Lake Science and Learning Center shared insights (and food!), headed into the field, and discussed future analyses. It was a hoot! Shortly thereafter, I was invited by Linda Hilligoss of the Crater Lake SLC to give a lecture on climate change in the parks for a teacher's workshop she was hosting. I enjoyed teaching and being taught by educators from across the region. Finally, the Network hosted a statistics workshop at Southern Oregon University in August, where staff from across the network brought their own data and were taught how to use 'R' by Drs. Kirk Steinhorst, Leanne Starcevich, and Matt Nahorniak. We enjoyed looking at each other's data, stealing code, brushing out old cobwebs, and chatting in the halls.

These experiences, and the articles in this newsletter, hinted to me that we are self-organizing across the network, and actively creating opportunities to share insight across parks, institutions, positions, and disciplines. While we often use the terms science delivery and reporting to discuss what we do in Inventory and Monitoring, this year I felt it has become a conversation, and I think that is a very good thing. I look forward to seeing many of you at our upcoming Board or Directors meeting in Ashland, or around the network this year. Let's keep the conversation going!

Kaleidoscope Fall 2013

Vegetation Monitoring 2013

Completion of One Round of Sampling

Matrix site at Oregon Caves National Monument

By Sean Smith

For the 2013 field season the Klamath I&M Network (KLMN) implemented its Vegetation Monitoring protocol at Oregon Caves NM (ORCA) and Crater Lake NP (CRLA). The season was a huge success, as we met all our 2013 monitoring goals! We monumented and measured 10 matrix sites at ORCA, and 20 riparian, 20 high elevation, and 26 matrix plots at CRLA. All monitoring plots are 0.1ha (20mx50m) and are within one of three sample frames: riparian, high elevation, and matrix. Riparian sites are along streams. High elevation sites are above an elevation threshold, 2057 m (6750 ft) at CRLA. Matrix sites are anything else (with some safety restrictions). This was our third season of Vegetation Monitoring and we now have completed one full round of sampling, and have visited all six KLMN parks. Of the other four parks, three have had all sites monumented: Redwood 21 riparian, 26 matrix; Lava Beds 30 matrix; Whiskeytown 15 riparian, 10 high elevation, and 21 matrix. Lassen does not have all sites monumented yet. During the 2012 season, the Reading Fire prevented us from accessing some sites at Lassen. We only have 14 riparian, 10 high elevation, and 18 matrix sites at Lassen thus far. On our next visit to Lassen, in 2015, we will complete monumenting of matrix and riparian sites.

Riparian site species richness was astoundingly high. For instance, mean riparian species richness at Lassen was nearly 4 times that of the matrix sites. An awe-inspiring 93 species were recorded from a riparian site at Lassen. Two sites at WHIS had an impressive number of species. The second highest number of species in a plot was 92, and the overall maximum number of species observed in a 0.1 ha plot was…wait for it…94! Matrix sites species richness followed behind riparian and high elevation sites were the lowest.

For the winter of 2013/2014 we will be busy identifying specimens and finishing up data quality control and quality assurance of the 2013 data. We also will be preparing site dossiers for all sites and our first vegetation analysis and synthesis report. This years analysis and synthesis report will summarize the status of vegetation. Future analysis and synthesis reports will focus more on detecting trends.

Riparian site at Crater Lake National Park

Towards a Better Understanding of the Vegetation at Lava Beds

Sagebrush Steppe, an especially abundant vegetation at Lava Beds National Monument

By Dennis Odion & Dominic DiPaolo

The Klamath Network Inventory and Monitoring Program received funding from the joint National Park Service/U.S. Geologic Survey National Vegetation Mapping program to inventory and map the vegetation of Lava Beds National Monument. The field work was conducted by Southern Oregon University researcher Dominic DiPaolo under the direction of Research Associate Dennis Odion. Systematic field sampling of the vegetation at Lava Beds began in June, 2009. The field work has been completed and the vegetation has been classified into 24 plant associations. The distribution of these associations across the park is now being mapped.

The primary objective of the national Vegetation Mapping Inventory is to produce high-quality, standardized maps of the vegetation, supported by detailed inventories. The inventory classifies the vegetation into recognizable types, or associations. The classification provides a language allowing effective communication about the vegetation. The vegetation map helps park managers understand the spatial organization of vegetation, which is crucial for protecting and managing the parks and the plant and animal biodiversity they contain. The vegetation inventory and map can also provide a baseline against which to measure future changes. For example, at Lava Beds there is concern about non-native cheatgrass invasion and increases in native junipers due to altered fire regimes.

Foreground: Annual grasslands

Accurately portraying vegetation on a map is challenging. This is because vegetation types often blend into one another gradually. For example, at Lava Beds, sage-steppe vegetation changes subtly with elevation, in that they are different sub-species. Along much of the elevation gradient, the sagebrush vegetation exhibits no discrete changes. Yet, the sagebrush at lower elevations differs considerably from the sagebrush at upper elevations. Capturing the different sagebrush types requires that a boundary between them be drawn. Determining where such a boundary should be placed can be vexing. Vegetation mapping can be described as both an art and a science because of the quantitatively-influenced, yet ultimately qualitative decisions the mapper must make.

The development of Geographic Information Systems (GIS) in the 1980s greatly expanded the possibilities for mapping vegetation. Using a GIS, the mapping product can be a digital atlas. This means that a wide variety of vegetative features can be described within any given area delineated on the landscape. The power of GIS will make the Lava Beds map more useful to the park managers. The map and database should be completed in early 2014.

The Redwood National and State Parks Vegetation Classification and Mapping Project Map Data Sets Completed and Delivered!

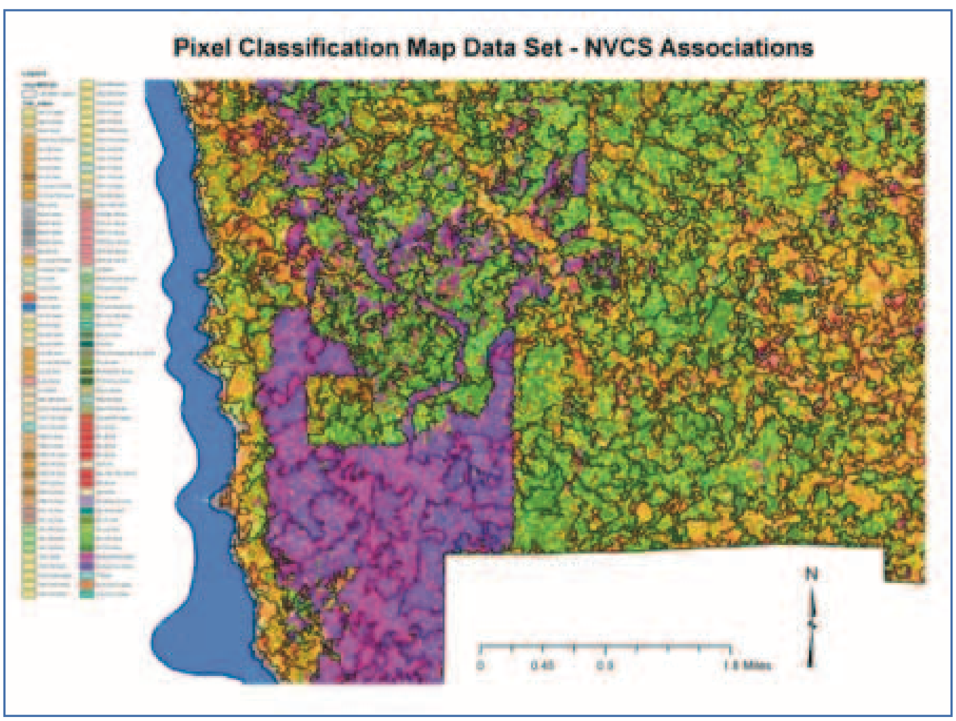
By Ken Stumpf and Leonel Arguello

The Redwood National and State Parks Vegetation Classification and Mapping Project (RVCMP), was initiated in the spring of 2008 under the National Vegetation Mapping Program, and completed this past June, 2013. The primary goals of this project were twofold: 1) to develop a new comprehensive Vegetation Classification that would improve upon past Vegetation Classification efforts and 2) to develop new map data sets for the Redwood National and State Parks (RNSP) that would provide a solid foundation for natural resource inventory, planning, monitoring, analysis, and decision-making efforts. Newly collected plant community descriptions provided the basis for the Vegetation Classification efforts. These field data also provided the basis for mapping efforts that involved the classification and analysis of Landsat 5 Thematic Mapper satellite imagery.

Such a combined Vegetation Classification and mapping effort is highly dependent on the collection of large amounts of detailed quantitative field data. A total of 360 relevé samples collected by Dr. Ayzik Solomeshch comprised the Vegetation Classification data set. 445 plant community/landscape feature descriptions (ground-truthing) based on the implementation of line-point transect sampling were acquired and used to build the image classification training data set that was used to associate the ground-truth characteristics with the spectral image data. Both field sampling efforts included the estimation of species-specific cover values and the identification of trace species. Transect sampling efforts also included tree diameter (dbh) and canopy radius estimates for all tree features, as well as canopy position designations for every recorded vegetation/landscape feature. Sudden Oak Death Syndrome subplots and FireMon fuel sample transects were integrated with the transect sampling approach to provide additional information.

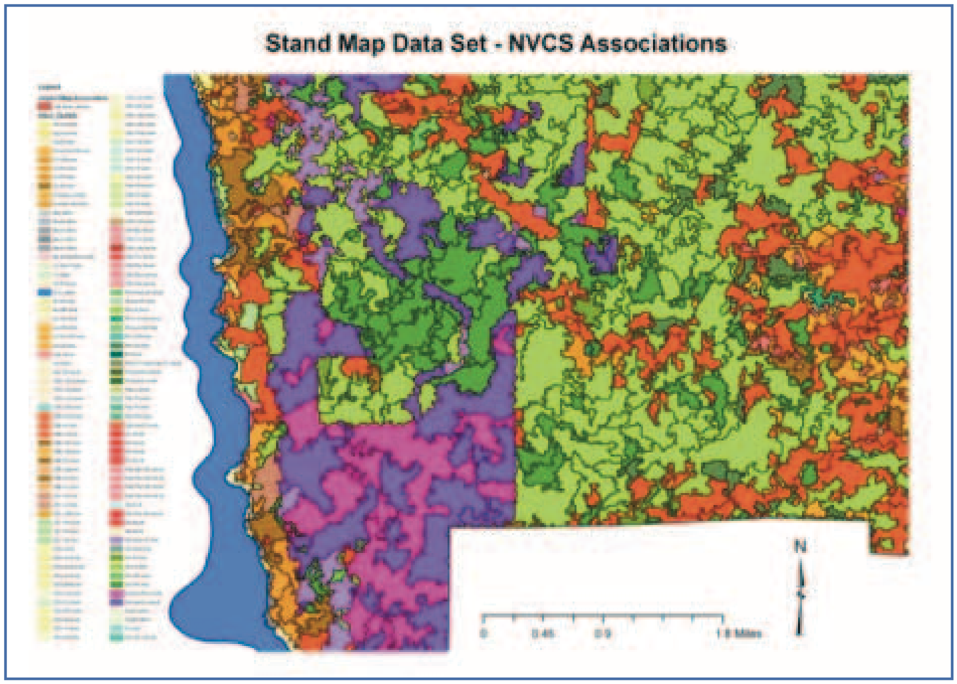
The Vegetation Classification efforts resulted in recognition of a total of 99 plant associations and/or land-cover types, including 44 forestland types, 18 shrubland types, 15 dry and mesic herbaceous types, 11 wetland herbaceous types, 8 dune herbaceous types, and 3 additional land-cover types that represented sparse vegetation, barren areas, and water bodies.Geographic Resource Solutions (GRS) used their Discrete Classification Mapping Methodology (DCMM) to relate the detailed quantitative field data descriptions to the spectral signatures discernable in the Landsat TM imagery. This approach results in the retention of the detailed field data information throughout the mapping process, rather than the usual loss of information that accompanies more generalized classification procedures.

The Vegetation Mapping efforts resulted in two map data sets. The first was a raster map data set which represented the original image classification efforts at the Landsat pixel level of resolution. The second was a vector/polygon map data set which represented stands aggregated as distinct objects based on the similarity of their plant community and landscape characteristics. Both map data sets contain species-specific and lifeform cover estimates; tree size (diameter



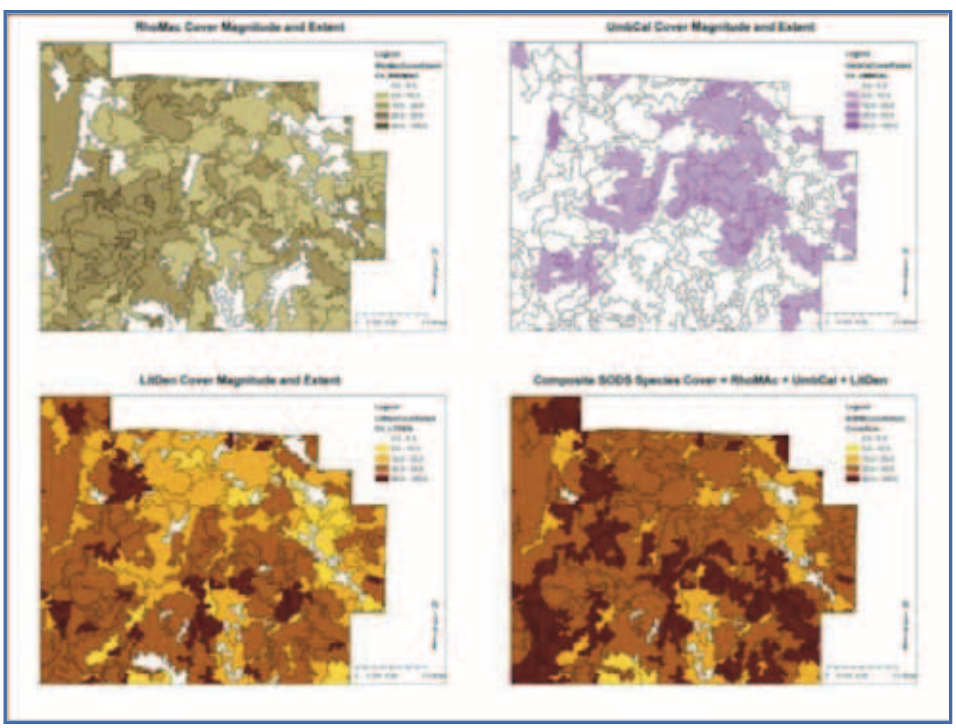
Raster map data set representing the original image classification efforts at the Landsat pixel level of resolution.

Vector map data set representing stands aggregated as distinct objects based on similarity of plant community and landscape characteristics.



and crown) and stocking (stems/acre) information; ground surface condition descriptions; and woody debris counts. All aggregated stands meet or exceed the minimum mapping unit size limit (MMU) of 0.5 hectares or about 1.2 acres. The stand map data set was developed from the raster map data set based on the aggregation of the pixel classification map data. Each pixel or group of pixels that were smaller than the MMU were compared with adjacent mapped data and merged into the adjacent mapped stand of the most similar vegetation/land-cover characteristics. Similarity was primarily based on the presence/absence of species and the relative magnitude of the species that were present using an approach very similar to how the Vegetation Classification was performed.

The resulting map data sets contain much more information than a color lookup table value or an NVCS type name. While the species-specific cover estimates do enable the assignment of NVCS type designations, these cover estimates along with the associated tree size and stocking estimates, fine and coarse woody debris counts by size and decay class, and landscape feature estimates enable the mapping of a myriad of other information as well. Maps of the extent and magnitude of cover of individual species or combinations of species may be generated rather than simply mapping NVCS alliances or associations by creating a new legend based on the attribute table column that contains that species' cover estimate. Maps of different fine and coarse woody debris fuel classes may be developed, or maps representing average tree diameter, crown size, or stems per acre. Ken Stumpf of GRS maintains that "we can often develop different answers to our queries and analyses when we map and/or evaluate species components rather than just associations or alliances." The detailed quantitative information content of these map data sets will provide a solid foundation for present and future resource management information needs.



Maps of the extent and magnitude of cover of individual species or combinations of species may be generated rather than simply mapping NVCS Alliances or Associations by simply creating a new legend based on the attribute table column that contains that species' cover estimate.

A Vegetation Classification For Lassen Volcanic National Park

By Dominic DiPaolo

***Tsuga mertensiana / Lupinus obtusilobus* Forest Association. Small Mountain Hemlock trees with characteristic high herbaceous cover of Bluntlobe Lupine .**

The Lassen Volcanic National Park (LAVO) vegetation classification and mapping effort offers a broad context for interpreting vegetation resources and a foundation for future research at the Park. This project examines overall vegetation patterns in LAVO to describe the distribution and diversity of plant associations therein. Using traditional vegetation classification methods, 65 upland vegetation alliances and associations and 40 wetland alliances and associations were described in LAVO.

This project was completed through a collaborative effort with multiple partnering scientists and stakeholders. Daniel Sarr, program manager of the Klamath Network coordinated the overall effort. Ayzik Solemeshch, researcher with University of California, Davis, led the upland classification effort using traditional vegetation inventory and classification methodology. Field work and synthesis of data into the final report was done with the assistance of Sean Smith, Klamath Network botanist, and Dennis Odion, Dominic DiPaolo, Kristi Mergenthaler with Southern Oregon University. Paul Adamus and Cheryl Bartlett of Oregon State University collected field data of wetland vegetation within LAVO in 2006. Janet Coles Lassen Volcanic National Park Ecologist analyzed this data to create a classification of wetland alliances and associations. Sean Smith of the Klamath Network wrote the description for these wetland vegetation types. The uplands and wetlands classification, were used to inform the mapping of the vegetation at Lassen done by Cogen Technology Inc.

LAVO encompasses a large, mostly forested, mountain landscape at the far southern end of the Cascade Range in northern California and straddles the high mountain divide separating the eastern and western foothills. The vegetation shares many affinities to the northern Sierra Mountains directly to the south of LAVO. Volcanic activity, most notably the recent eruptions of Mt. Lassen between 1914 and 1916, has shaped the pattern of vegetation through much of the park.

The upland vegetation classification describes 32 forest associations in 8 alliances, 9 shrubland alliances, and 16 herbaceous vegetation associations. The wetland vegetation classification describes 5 forest associations; 1 shrubland alliance and 5 shrubland associations; and 3 herbaceous alliances and 26 herbaceous associations. A dichotomous key to both upland and wetland alliances and associations was also produced to assist park staff and researches identify vegetation types in the field.

***Monardella odoratissima – Penstemon gracilentus* Association.**

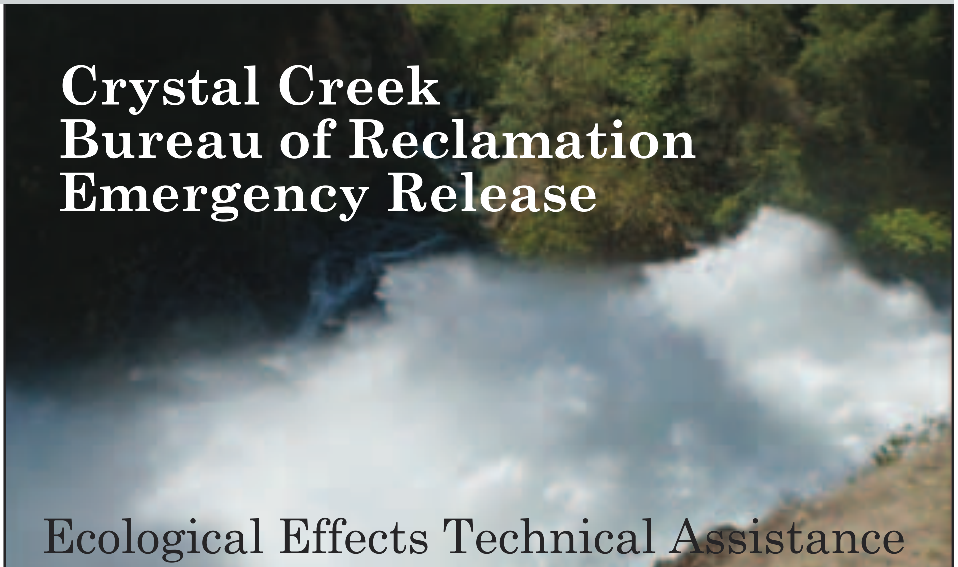
2013 Lakes Monitoring Update

By Eric Dinger

This past summer was the first implementation of the Integrated Aquatic Communities and Water Quality in Mountain Lakes and Ponds. The protocol, approved in 2011, occurs every three years in Lassen Volcanic National Park, Crater Lake National Park, and a single freshwater lagoon in Redwood National Park. The field crew of two, Crew Leader Kirsten Underwood and Crew Technician Eric Scott, sampled 28 lakes and ponds in Lassen Volcanic National Park, and another six ponds in Crater Lake National Park, and thus met the sampling goals of the protocol. They sampled for aquatic invertebrates, zooplankton, fish, shoreline habitat, water quality and water chemistry. An unfortunate occurrence, due to the government shutdown, led to the loss of most water samples associated with Dissolved Organic Carbon, a leading indicator of climate change.

The sampling also included three lakes within the Reading Fire area, which will help inform park managers about fire effects to small mountain lakes. Another notable highlight is the lack of any ponds visited by the crew with Long-toed Salamander die-offs from ranavirus. Previous sampling in 2008 and 2010 had seen salamanders die-offs; none were apparent this year.

Samples are currently being processed by contract laboratories, with results due back in spring 2014. Resource briefs and an annual report will be finalized in mid to late FY2014.



Crystal Creek Bureau of Reclamation Emergency Release

Ecological Effects Technical Assistance

On July 21st, the BOR (Bureau of Reclamation) performed an emergency release of 1600 CFS (cubic feet water per second) in the watershed of Crystal Creek, in a period with estimated baseflow of 20 CFS. While Klamath Mountain watersheds experience flood events on this scale, the timing of the emergency flood in the middle of summer is out of bounds with the natural disturbance cycle. Due to this, an investigation was started by the KLMN with assistance from WHIS staff to study the ecological impacts of this asynchronous flood event.

Two sites previously sampled by the KLMN stream crew in 2011 were directly impacted by the flooding – one on Crystal Creek itself, and another on Willow creek below the confluence with Crystal Creek. Additionally, there was a site on Crystal Creek above the release point, allowing for a scientific control to determine impacts. A fourth site, in an unaffected watershed (Brandy Creek) was also sampled as a scientific control.

In early August, Dr. Eric Dinger, with WHIS staff, sampled the creeks for the aquatic communities – fish, amphibians, and aquatic invertebrates to document immediate impacts. The crew returned in late September to repeat the aquatic community sampling, plus perform the full KLMN wadeable streams protocol for water chemistry, physical habitat, and riparian communities.

The experimental design, (possible through the prior use of spatially balanced site selection), combined with a rapid sampling for short-term effects, and follow up sampling for recovery, will allow for a thorough understanding of the ecological impacts. A full report should be available early in calendar year 2014.

Collaboration at Treeline

Whitebark Pine Monitoring in the Klamath Network

By Eric Jules

We are excited to implement our final season of establishing a series of 30 long-term monitoring plots for whitebark pine this coming summer. Started in 2012, this project will allow us to monitor the health and fate of whitebark pines in both Crater Lake and Lassen National Parks, where the iconic tree is being threatened by a non-native pathogen – white pine blister rust – and recent outbreaks of the native mountain pine beetle. We're thrilled to see that our field crews have been able to stay on target by establishing ten plots per season in each park, as planned in the Klamath Network whitebark pine monitoring protocol. This effort is part of a collaboration between the Klamath Network, the Sierra Nevada Network, and the Upper Columbia Basin Network, and Humboldt State University to explore and communicate dynamics of five needle pines in high elevation areas of parks of the Pacific West Region.

Whitebark pine is known for its stunted, twisted appearance near treeline, where it forms a classic feature of American West treelines. Whitebark pine has a much larger range than most other subalpine conifers and is found from the southern Sierra Nevada to British Columbia and the northern Rockies. Beyond its beauty, whitebark pine serves several key ecosystem functions, including modulating springtime snowmelt (thereby increasing water availability in summer) and producing large seed crops critical to, for example, Clark's Nutcrackers. Unfortunately, whitebark pine is being affected by three of the most pressing types of threats in mountain regions of the West: exotic pathogens, fire suppression, and warming temperatures.

The goal of establishing the whitebark monitoring plots is to allow for detailed monitoring of a large number of individual trees. Within our 50 x 50 m plots, each and every whitebark pine >1.37 m in height is marked with its own unique identification number and then assessed for signs of the blister rust, pine beetle activity, and cone production. These plots will provide the kind of demographic data needed to determine if whitebark pine populations are truly in decline, and at what rate they are declining. Such data will also allow us to make better management recommendations for slowing the decline.

The project has been a huge opportunity for budding scientists. Over the past two seasons, the project has employed two graduate students and four undergraduates. All of these students learned a tremendous amount about field techniques and about working in alpine environments.

Invasive Species Monoitoring

By Sean Smith

The Invasive Species Early Detection protocol was not fully implemented in 2013. Obstacles emerged that we were not able to overcome in the hiring process. As a result three parks did not have the protocol implemented: Crater Lake, Lassen, and Redwoods. The other three parks were surveyed, but our target sample size was only met at Oregon Caves. At Oregon Caves the protocol was carried out by park Staff from 8/21- 9/4. All 11 segments at ORCA were surveyed (2 road and 9 trail), for a total of 11,945m. One invasive species (*Hypericum perforatum*) was observed 8 times at 4 segments.

Klamath Network staff surveyed Lava Beds from 6/3- 6/6. During that time we completed 18 segments (10 trail and 8 road), for a total of 38,647m. Four of the 18 segments were infested, and we observed 4 invasive species at 12 separate infestations. Species observed and number of infestations was: *Descurainia sophia* (4), *Salsola tragus* (1), *Taeniatherum caput-medusae* (2), *Tragapogon dubius* (5).

KLMN staff surveyed Whiskeytown from 5/28-5/31. During that time we completed 15 segements (10 road, 5 trail), for a total of 34,783m. Seven of the 15 segments were infested. We observed 5 invasive species at 20 separate infestations. Species observed and number of infestations were: *Aegilops triuncialis* (2), *Anthoxanthum odoratum* (1), *Centaurea melitensis* (1), *Centaurea solstitialis* (2), *Cytisus scoparius* (9). The Invasive Species Early Detection protocol is implemented every other year and will be implemented again in 2015.

Land Use/Land Cover Monitoring Protocol

By Lorin Groshong

After a very productive summer with three wonderful student interns from Southern Oregon University, I am happy to say that the long-awaited Land Cover Protocol is going to be complete within this winter. Interns Jacob King, Jace Ives, and Monika Tantare were able to complete geographic analyses for six major Land Cover and Land Use metrics – and these have been completed for all of the Klamath Network parks and at least two other regions around each park.

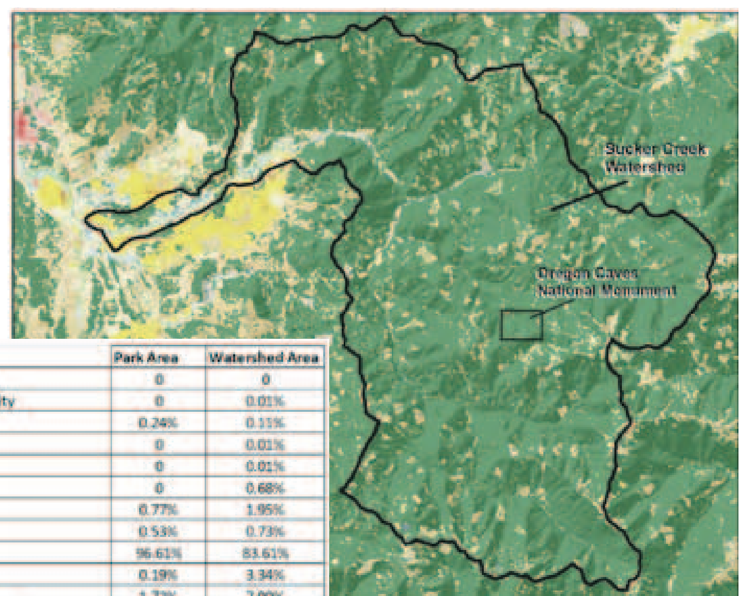
As you may remember from our meetings about this protocol, the following Land Cover and Land Use metrics are being analyzed:

- Land Cover (Anderson I and Anderson II level classifications)
- Pattern Metrics (edge and core habitat, measurements of fragmentation)
- Roads (density and pattern weighted by road type)
- Land Ownership and Management/ Conservation Status
- Population Density (historical through future projections)
- Housing Density (historical through future projections)
- Disturbance (fire, insect/disease)

The analyses that the interns completed over the summer provide very intriguing looks at the answers to some of our monitoring questions for our region, such as:

- What proportion of land both in and around our parks has been converted to urban or agricultural uses over time?
- How much of the land surrounding our parks is protected from harmful anthropogenic changes and what does this say about future risks to resources?
- How has the connection of patches of natural habitats changed within the parks and in connection with key habitats outside of park boundaries?
- What is the spatial relationship of park boundaries with areas of increasing housing and population densities?

Here is a look at the variety of land cover types in the watershed that contains Oregon Caves National Monument



	Park Area	Watershed Area
Developed High Intensity	0	0
Developed Medium Intensity	0	0.01%
Developed Low Intensity	0.24%	0.15%
Developed Open Space	0	0.01%
Cultivated Crops	0	0.01%
Pasture/Hay	0	0.68%
Grassland/Herbaceous	0.77%	1.95%
Deciduous Forest	0.53%	0.73%
Evergreen Forest	96.61%	83.61%
Mixed Forest	0.19%	3.34%
Scrub/Shrub	1.72%	7.90%
Palustrine Forested Wetland	0	0.93%
Palustrine Scrub/Shrub Wetland	0	0.29%
Palustrine Emergent Wetland (Persistent)	0	0.23%
Unconsolidated Shore	0	0.01%
Barren Land	0	0.12%
Open Water	0	0.03%

Landbird Monitoring in the Klamath Network

Brandon Breen,
Klamath Bird Observatory

Klamath Bird Observatory's Science Director, Jaime Stephens, walks to her next landbird monitoring station at Lassen Volcanic National Park

Starting in 2008, Klamath Bird Observatory—in partnership with the National Park Service's Klamath Network—has been carrying out landbird monitoring at six national park units in northern California and southern Oregon: Crater Lake National Park, Lassen Volcanic National Park, Lava Beds National Monument, Oregon Caves National Monument, Redwood National and State Parks, and Whiskeytown National Recreation Area. This year, we monitored landbirds at Crater Lake and Oregon Caves, thereby completing our second round of visits to all park units.

Landbird monitoring is an essential part of the Klamath Network's Inventory and Monitoring Program. Landbirds are particularly useful indicators of ecosystem health. Landbirds vocalize their presence through song and many species can be monitored in a cost-effective way using a single monitoring protocol. Also, landbirds are diverse and an ecosystem must contain a large number of specific habitat components (e.g., dead snags for cavity nesting) in order to support a varied bird community. When ecosystem health deteriorates some of these habitat components disappear, and some bird species along with them. Thus, landbird monitoring provides a critical window into the vital signs of an ecosystem.

The ultimate goal of this long-term monitoring program is to generate information and understanding that will enable the National Park Service to preserve its natural resources. Monitoring data shed light on the condition of park ecosystems and will alert park officials of any failures in ecosystem function. Moreover, these monitoring data help us better understand park ecosystems and provide reference data for comparisons among sites or through time.

We apply two different methodologies to landbird monitoring: breeding season point count surveys are used in all park units, and bird banding is employed at Oregon Caves. In 2013, we completed two scientific reports that in combination provide a picture of the abundance of landbird species as well as the habitat relationships of individual species in the five large park units (not including Oregon Caves). These two reports establish the foundation from which future analyses will build. The two reports—Estimating bird density and detection probability at five national park units in southern Oregon and northern California and Bird-habitat associations at five national park units in southern Oregon and northern California—can be found on the National Park Service's Klamath Network website (http://science.nature.nps.gov/im/units/klmn/).

A Pacific-slope Flycatcher sits in its nest at Whiskeytown National Recreation Area.
Photo by Frank Lospalluto

Lessons Learned...
Notes from SOU/KLMN Interns

Sarah Elvington

During my time with the Klamath Network I have had the opportunity to work on many different projects, and incorporate several areas of interest.

This summer I joined the field crew at Crater Lake National Park, to spend three days doing vegetation monitoring, experiencing first hand the methods of gathering data for the NPS Inventory and Monitoring Program.

Here in the office I have been able to combine my interest in conservation biology with my background in graphic design. Featured creature articles, give me a chance to research and showcase some of the flora and fauna found within the Klamath Network Parks. Resource briefs allow me to spend time with in-depth scientific reports and understand them to the point of being able to restructure the main message into a form appropriate for a wide audience. Compiling the fall newsletter, the Klamath Kaleidoscope, has me communicating with many scientists and researchers from the region and creating a visually engaging presentation of the Networks accomplishments for the year.

I have also had the chance to create a few biological illustrations, an activity that always brings me joy!

Kaitlyn Wright

During my internship with the Klamath Network I gained much knowledge about field work, plant identification and working with a group to complete tasks. I learned the importance of being attentive about the location of sites, double checking that we had all the necessary equipment and adequately preparing for the day's hike. In the field I became more aware of potential hazards such as dead trees that could drop limbs, yellow jacket hives and slippery logs and rocks. Working with several different people was beneficial in that I was able to learn how to work effectively with different types of personalities by taking on more leadership or being open to direction as necessary. I was able to pick up a lot about plant identification and the characteristics of plant families. Overall my experience was extremely valuable.

Long-toed Salamander
Illustration by Sarah Elvington

Clint Nichols

This summer, I interned with the Klamath Network and Southern Oregon University working with Dennis Odion and Dominic DiPaolo. We spent 8 days in the field at Lava Beds National Monument and 4 days at Crater Lake National park working on the vegetation mapping project commissioned by the National Park Service. I was particularly excited about this internship because it gave me some exposure to vegetation classification and field work with vegetation, something I am lacking in experience. I learned how to use a dichotomous key to identify plants, how to visually identify trees, shrubs, and grasses and estimate percentages of cover within a discrete area, and to record plot data such as aspect, slope, and GPS coordinates. I also spent several weeks working in the office on several vegetation reports, editing, formatting, and proofing them before final delivery.

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, sciencebased managerial decision-making, and resource protection.

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