



**National Park Service
Northern California and Southern Oregon
Fire Ecology Annual Report
Calendar Year 2004**

Summary

The Northern California and Southern Oregon fire ecology group provides services to six separate parks and includes [a fire effects crew located at Redwood National and State Parks \(REDW\)](#) and fire ecologist positions at Whiskeytown National Recreation Area (WHIS) and Crater Lake (CRLA), the latter of which is currently vacant. During the calendar year, a variety of different activities were completed in support of fire and resource management programs. Fire planning and support efforts saw significant accomplishments at the parks with the signing of the new fire management plan (FMP) at WHIS, including the park's fire monitoring plan appendix, and the completion of [a draft FMP and fire monitoring plan at REDW](#). Significant gains were also made towards the completion of the FMP for Oregon Caves National Monument, with final draft versions expected early in 2005. From a workload standpoint, these gains should significantly reduce near term requirements for fire planning and allow for continued expansion of other fire ecology efforts.

Apart from planning, a number of other fire ecology projects occurred [within the network](#). To a large degree, these projects reflect the changing nature of fire management at the parks, most notably, the growing emphasis on managing threats within the Wildland Urban Interface (WUI), [expanding requests for limited fire](#) monitoring resources within the [network](#) and an increasing reliance on [alternative treatments such as spring burning and mechanical fuels treatments](#). These trends are expected to continue within the near future, providing both challenges and opportunities to the fire ecology programs at the parks.

Whiskeytown NRA:

At WHIS, 13 new rapid assessment monitoring plots were established in two separate proposed prescribed fire treatment units. As commonly occurs, the lack of an appropriate prescribed fire window prevented the implementation of the treatment projects, delaying post-burn monitoring until a future point in time. Other prescribed fire monitoring included the completion of additional CBI plots in both the Power Tower and Shasta Divide burn units, both of which were treated during the winter/spring of 2004. These CBI monitoring projects represent the third and fourth CBI monitoring projects at WHIS. A final report is expected for these projects early in 2005 and is expected to show a very high level of confidence in the use of satellite imagery for the delineation of fire severity within the tested vegetation complexes ([Figure 1](#)).

The rapid expansion of mechanical fuels treatment acreage at the park has been addressed by a few different monitoring protocols. One ongoing methodology includes shaded fuelbreak monitoring. This monitoring system focuses on tracking and describing relationships between environmental condition with species composition and microhabitat variables, with a particular focus on exotic plant species that pose a threat to the integrity of the park. Preliminary data from this monitoring has been presented to a number of audiences and has been a significant aid in the refinement in the installation and maintenance of shaded fuelbreaks within the park. Additional monitoring includes the adoption of a pilot photo point monitoring program for mechanical treatment areas and a rapid assessment pilot sampling of larger WUI treatment areas.

Fire ecology research continued through the second complete year of a Joint Fire Sciences project at the park. Accomplishments within this project during the past year included both on site visits and offsite presentations, the initiation of a seedbank study, a soil chemistry study, and the completion of a project and park fire ecology webpage available at <http://www.nps.gov/whis/exp/fireweb/FireEcology/home.htm>.

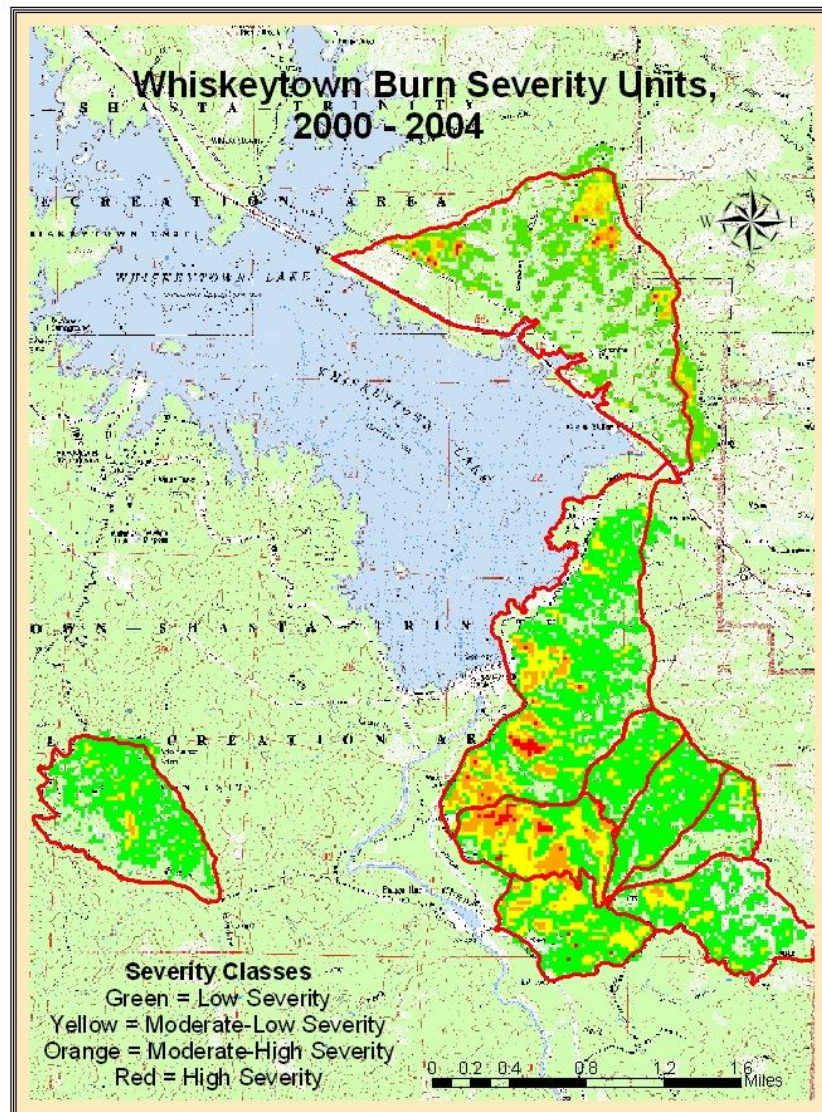
Redwood

A fire monitoring program review was conducted early in 2004, identifying the need for the program to address landscape scale objectives and to enable monitoring within previously untreated ecosystems (second growth forests, Little Bald Hills and Coastal prairies). The anticipated completion of the park's Fire Management Plan in 2005 should serve to further define the fire ecology and monitoring program at REDW.

Oregon Caves

At present, there is not an active fire management program at ORCA. The planned completion of the FMP is expected to increase the need for an active fire monitoring program. The draft fire monitoring report is expected to provide guidance to the monitoring program during the upcoming year.

[Figure 1: Composite burn Severity Map, Whiskeytown NRA](#)



Lava Beds

A portion of the monitoring activities performed at Lava Beds this year included plot installation and pre- and post-burn data collection for cheatgrass research in the Gillem prescribed fire unit. Other specific and more intensive research activities are on-going in other areas of the park. These activities are being conducted by researchers from Oregon State University. The only other monitoring performed this year was the second year postburn reads conducted in the South Boundary burn unit.

As a result of increasing workloads and decreasing monitoring personnel, a decision was made jointly by the fire ecologist and lead monitor to eliminate year one postburn monitoring for forest plots. Due to a continual decline in monitoring personnel, it is likely that this new protocol will be enabled for plots of all monitoring types, unless year one reads are specifically requested by fire or resource management staff.

Mary Rasmussen was the primary author for the fire management plan EA and two FMP chapters (Monitoring & Evaluation, and Fire Research). She completed a detailed Fire Effects Monitoring Plan based on a recently-completed LABE fire regime study by Rick Miller. Rick's research was Firepro funded.

Crater Lake

Once again, the Fire Management Program underwent the turnover of Fire Management Officers. As a result of this and another year of early season prescription-crushing precipitation no prescribed fires occurred in the park. Because this was the case last year, and there does not yet exist a voluptuous amount of monitoring plots, fire monitoring activities were limited to reading two plots in the Pan Handle 3 unit. This unit was treated in the fall of 2002.

Mary authored 6 chapters of the CRLA FMP and developed a detailed Fire Effects Monitoring Plan for approval by the September 30 deadline.

Lassen Volcanic National Park

Successful fire management activities at LAVO included burning approximately one half of the Butte Lake burn unit along the northern boundary, which is shared with the USFS. Monitoring data was collected both pre and immediately postburn on twelve of the thirteen existing plots. (The pre reads were really 01yr09 and 01yr14 reads). Other data collection included second year postburn reads in the Hole unit and five year postburn reads in the Roadside unit.

The long-awaited Prospect Peak burn was interrupted by early snowfall and was not attempted. This unit contains two FMH forest plots which were installed several years ago and re-read this summer in anticipation of the burn.

Lassen's Fire Management Plan is completed and the Environmental Assessment is undergoing public review. Mary helped park staff to develop a third alternative for the Fire Management Plan EA (emphasizing wilderness values). She lead park staff in the compilation of the EA as Lead Editor, and completed two FMP chapters (Monitoring & Evaluation, and Fire Research). Mary was not able to develop a Fire Effects Monitoring Plan because of a move to Grand Canyon National Park.

Table 1. Fire Effects Plot Workload 2004

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
Crater Lake	<u>Ponderosa Pine</u>	<u>FMH</u>			<u>2</u>	<u>14</u>
Lava Beds National Monument	<u>Ponderosa Pine</u>	<u>FMH</u>			<u>2</u>	<u>11</u>
	<u>Sagebrush Steppe</u>	<u>FMH</u>			<u>7</u>	<u>36*</u>
	<u>Perennial Bunchgrass</u>	<u>FMH</u>	<u>6</u>	<u>4</u>		<u>16*</u>
Lassen Volcanic National Park	<u>Ponderosa Pine</u>	<u>FMH</u>		<u>3</u>	<u>4</u>	<u>8</u>
	<u>Jeffrey Pine</u>	<u>FMH</u>			<u>2</u>	<u>2</u>
	<u>Lodgepole Pine</u>	<u>FMH</u>			<u>3</u>	<u>3</u>
	<u>White Fir</u>	<u>FMH</u>		<u>9</u>	<u>11</u>	<u>19</u>
	<u>Red Fir</u>	<u>FMH</u>	<u>2</u>			<u>9</u>
Oregon Caves National Monument	None					
Redwood National & State Parks	Mixed Prairie	FMH	0	<u>6</u>	<u>3</u>	<u>20**</u>
	Oak Woodland	FMH	0	<u>4</u>	<u>8</u>	<u>19**</u>
Whiskeytown National Recreation Area	WUI, Mixed Woodlands - Prescribed Fire	Rapid Assessment (pilot sampling)	8	0	0	8
	Upper elevation, Mixed Conifer - Prescribed Fire	Rapid Assessment (pilot sampling)	5	0	0	5
	WUI, mixed woodlands and shrublands, Prescribed Fire	CBI	38	0	0	<u>97</u>

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	WUI, mechanical fuels treatments	Photo point	22	0	0	22
	Shaded Fuelbreak Monitoring	Rapid Assessment	0	5	30	35
	Knobcone Pine	FMH	0	0	0	5
	Mixed Conifer	FMH	0	0	0	14
	Black Oak	FMH	0	0	0	5
	Shrublands with Emergent Trees	FMH	0	0	0	4
Total			81	31	72	265

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*This number may vary from numbers reported in the past. The former fire ecologist (M. Rasmussen) changed the monitoring types of some grass and forest plot types, resulting in different numbers than last year.

**This number includes only plots that are in "Active" status does not include 16 prairie plots and seven oak woodland plots that are not in the active monitoring category.

Table 2. Fire Ecology Staffing 2004

Complete or devise a staffing and personnel development table for fire ecologist and monitors. Include fire training (e.g. S-290, RX-310), distance learning or on-campus college credit, technology training, NWCG taskbooks initiated or completed, conferences attended, etc.

Ecologist	Starting Date	Ending Date	# of Pay Periods	Training and Development
Tim Bradley	1/1/04	12/31/04	26 (half-time beginning March 1)	- S-330 Task Force/ST Leader - STL trainee (initiated) Type II ignition specialist trainee (initiated) - Landfire/VDDT training - Pan-American Fire Conference (Costa Rica) - International Fire Trainer (Guatemala)
Jennifer Gibson	3/1/04	12/31/04	20 (half-time beginning March 1)	<u>-Resource Advisor Training</u>

Mary Rasmussen, Ecologist	10/01/03	09/18/04	25	Attended the bi-annual AFE conference, completed COR certification, TNC Crew Boss Academy, Rx-510, & IOF3 task book.
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Monitor	Starting Date	Ending Date	# of Pay Periods	Training and Development
Dana Sandifer	1/1/04	12/31/04	26	RX-310, I-100, I-200, S-260
Julie Dubose	2/23/04	12/09/04	21	S-260, I-100, I-200
Paul Senyszyn	5/10/04	09/01/04	9	
Christy Frenzen	5/24/04	10/22/04	11	

Table 3. Management Objectives and Monitoring Results 2003

Monitoring Unit WHIS	Management Objective	Monitoring Results	Objective Achieved?
Knobcone Pine - FMH	Immediate post burn reduce average total dead and down fuel loads 20-90% from pre-burn levels	Total fuel increase = 9.1% (<i>n=5 plots, 1 burn unit, treated twice</i>)	No
	By year two decrease average percent cover of live mature brush species 25-80% from pre-burn levels	Live cover = 22% reduction (<i>n=4 plots, 1 fire</i>)	No
Mixed Conifer	Immediate post burn reduce average total dead and down fuel loads 20-70% from pre-burn levels	total fuel reduction = 56% (<i>n=9 plots, 2 fires</i>)	Yes* *but minimum sample size not achieved
	Limit average mature overstory conifer tree mortality (DBH > 60 cm/24") to less than 25% of pre-burn levels by year five.	stand basal area = 17% reduction (<i>n=9 plots, 2 fires</i>)	Yes* *but minimum sample size not achieved
Black Oak Woodlands	Immediate post reduce average total dead and down fuel loads 20-90% from pre-burn levels.	Total fuel reduction = 75% (<i>n=5 plots, 1 fire</i>)	Yes* *but minimum sample size not achieved

Monitoring Unit WHIS	Management Objective	Monitoring Results	Objective Achieved?
	Decrease average percent cover of live mature ARVI 25-80% from pre-burn levels by year two	Total live cover ARVI = 79% reduction ((n=5 plots, 1 fire)	Yes* *but minimum sample size not achieved

Monitoring Unit REDW	Management Objective	Monitoring Results	Objective Achieved?
Mixed Prairies	Maintain or increase native plant cover	Native cover = 12% increase (n=10 plots, minimum 3 burn cycles)	YES
Oak Woodlands	Maintain or increase native plant cover	Native cover = 1.1% decrease (n=6 plots, minimum 3 burn cycles)	No* *but minimum sample size not achieved

Ecologist Accomplishments:

At the end of February, the [Whiskeytown](#) fire ecologist entered into a ½ time detail position with the DOI, International Technical Assistance Program, serving as the program coordinator for a fire and pest management program in Central America. This detail position was reimbursed by the DOI, allowing for the backfill of the fire ecologist by the park ecologist. As a result of this backfill, accomplishments by the Whiskeytown fire ecologist position are shared. Primary accomplishments not already listed include the following:

- Two separate fire monitoring plans (Whiskeytown and Redwood) were produced.
- A fire ecology and monitoring web page was produced highlighting research and ecology efforts <http://www.nps.gov/whis/exp/fireweb/FireEcology/home.htm>
- Continuation of Joint Fire Science funded research project, including;
 - Installation of 60 new plots and a total recording of 180 vegetation monitoring plots
 - Recording of 24 fire intensity (thermocouple) plots
 - Initiation of a soil seedbank study
 - Completion of a soil fertility study
 - Prescribed burning of half of the fall treatment plots
- Completion of fuels and forest inventory at ORCA for the support of the fire management plan
- Presentation of FMH summary data to fire and resource management staff at two separate parks
- [JFSP research outreach included:](#)

- A presentation at the Kirlin Lecture Series in Ashland, Oregon
- A poster was presented at the JFSP Principal Investigator's Workshop in Arizona.
- A field trip to USFS Pacific Southwest Research Station personnel.
- A field trip for 50 HSU fire ecology students.
- Presentation of rapid assessment data and preliminary results of CBI monitoring program to WHIS park resource management and superintendent and to the annual Inventory and Monitoring Program's Team Leader's Meeting.
- Presentation of WHIS shaded fuelbreak monitoring data at
 - Regional fire ecology meeting
 - WHIS fire and resource staff
- Collaboration with Pacific Southwest Research Station staff, Oregon State University, USGS Water and Biological Resources Divisions, and the Klamath Bird Observatory on research proposals.

As the Fire Ecologist for CRLA, LABE and LAVO parks, Mary Rasmussen assisted the fire and resource management staffs with planning, monitoring and research coordination, and implementation of various fire management activities:

Fire Monitoring and Research

CRLA: Mary coordinated vegetation sampling and the collection of fire behavior data for the PH-1 Rx burn (Oct 2003) to assess relationships of dwarf mistletoe infestation and ponderosa pine mortality. The study is part of the dissertation work by Sharon Stanton at Portland State University. Final post-burn data and study conclusions were reported by Dan Perrakis and Jim Agee in their study of ponderosa pine mortality associated with spring versus fall prescribed fire in the panhandle region of the park.

LABE: Mary coordinated vegetation sampling and fire behavior data collection for the Merrill burn unit that is part of a Joint Fire Science Program study assessing the relationships between ecological condition and fire effects on sagebrush ecosystems. Several researchers from Oregon State University are involved. Post-burn data collection was completed for a Joint Fire Science program study of fire treatments and the effects on bird abundance and distribution. Mary coordinated the Task Agreement with the Klamath Bird Observatory and is co-authoring a study manuscript that will be completed in 2005.

LAVO: No activities to report.

Fire Management Activities:

CRLA: Mary supervised a squad of interagency Resource Advisors during the Bybee Fire Complex, July 2004, and coordinated resource advice to the T2

Incident Management Team. Mary also completed her IOF3 taskbook during this fire assignment.

Mary assisted the FMO and Chief Ranger on a half-day field trip with representatives from the Umpqua Watershed Association to discuss the ecological implications of a fuels reduction project (small diameter tree thinning and pile burning) at Mazama Campground.

LABE: Mary provided resource advice, fire effects monitoring support, and traffic control for the Gillem Rx burn, April 2004.

LAVO: No activity to report.