



**National Park Service
CENTRAL AND SOUTHERN CALIFORNIA
Fire Ecology Annual Report
Calendar Year 2009**

**Channel Islands National Park
Golden Gate National Recreation Area
Joshua Tree National Park
Pinnacles National Monument
Point Reyes National Seashore
Santa Monica Mountains National Recreation Area**

Summary

Highlights

The Central and Southern California Fire Ecology and Fire Effects Monitoring program had another productive year during FY09. Fire effects monitoring was completed at Point Reyes (PORE), Golden Gate (GOGA), Pinnacles (PINN), Santa Monica (SAMO), Channel Islands (CHIS), Whiskeytown (WHIS) & Crater Lake (CRLA). Fire ecology and fire effects staff assisted with prescribed burns at PINN and East Bay Regional Parks. The San Francisco Bay Area Network (SFBAN) fire ecologist was active with outreach, research collaboration and assisting with the National Fire Ecology Program. During FY09, the Central and Southern California Fire Ecology and Fire Effects Monitoring program experimented with a new staff configuration where 12 pay periods of seasonal time were based out of SAMO. This configuration worked well and will be continued in FY10.

Fire Effects Crew

In 2009, the Central and Southern California Fire Effects Monitoring Crew (FEM) worked in seven parks, under the direction of four different fire ecologists. The season began in mid-April and the first monitoring trip was to CHIS and SAMO. On Santa Cruz Island, the FEM crew collected a third year of data for a project to assess shrub regeneration after a wildfire. The crew then continued on to SAMO to do year 4 reads of shrub plots burned in a 2005 wildfire.

In May, the FEM crew headed to PINN to install yellow starthistle monitoring plots in the Bottomlands unit. This burn unit is part of a restoration project on over 100 acres of newly acquired lands on the east side of the Monument. The area is currently dominated by starthistle and other non-natives and using a combination of fire, herbicide, and replanting, Monument staff are hoping to return the area to native grassland. Monitoring plots follow an alternate protocol designed by the PINN botanist. In June the crew returned to Pinnacles to participate in the Bottomlands prescribed burn.

Also in May and June, the FEM crew assisted the Bay Area Network Inventory and Monitoring staff, by working with them to re-read unburned FMH plots at GOGA and PORE for the purpose of looking at plant community change over time.

In June and July, the FEM crew began a new project to look at the effects of fire and mechanical plant removal on habitat improvement and expansion for the endangered mission blue butterfly. Plots were established at Milagra Ridge and the Marin Headlands (both in GOGA) using FMH protocols modified to meet the specific project needs. These units were not burned in 2009 due to early fall rains, but will be burned in 2010.

July and August were filled with three trips to northern parks, where the crew helped the Klamath-Cascades network. The FEM crew made two trips to CRLA, where first, the plots burned in the 2007 Cornerstone Burn were read. Next, new white fir plots in the adjacent Phoenix burn unit were installed. The PORE crew worked with the Eastside Klamath fire effects crew. The other northern trip was to WHIS, where the crew assisted the Westside Klamath fire effects crew (from Redwood) to do composite burn index (CBI) plots in two 2008 wildfires.

In addition, the crew read FMH plots at PORE and GOGA and worked with U.C. Berkeley researchers on a project examining the long term monitoring of the ecological effects of Sudden Oak Death.

Bay Area Network Fire Ecology

The SFBAN Fire Ecologist focused on collaboration with natural resources management and developing the fire ecology research program for the network parks. The fire ecologist worked with the network parks on the fire and monitoring aspect of three different restoration projects: restoring the Bottomlands and eradicating yellow starthistle at PINN, using fire and mechanical disturbance to restore habitat for the mission blue butterfly at GOGA, and using fire to eradicate Scotch broom at PORE. Monitoring plots have been or will be installed for all of these projects and fire and resources management are working closely together on project planning.

The SFBAN Fire Ecologist has also been working on developing the research program at the network parks. At PORE, the Fire Ecology Program has been working closely with UC Berkeley researchers to monitoring the long term effects of Sudden Oak Death on redwood and douglas-fir forests within the Seashore. Permanent monitoring plots were established in 2007 and

revisited in 2009. These data are currently be analyzed and will be written up in the coming months. The Fire Ecologist has also been working with park staff at both PORE and PINN to obtain continuing funding for SOD research and, in collaboration with the PINN botanist, was able to get a proposal funded for SOD early detection. The Fire Ecologist also worked with PINN staff, UC Berkeley researchers and tribal representatives to submit a proposal to examine Native American use of fire at PINN to the Joint Fire Science Program.

The Fire Ecologist was also active with outreach including a poster presentation at the California Association for Fire Ecology conference and at the Inventory and Monitoring Science Symposium. The Fire Ecologist assisted with teaching the FFI Ecological Monitoring Tools the Boise and Portland training classes.

In addition to her work with the SFBAN network, the Fire Ecologist has also continued to work on her doctoral research on the fire history of CRLA on a half time (unpaid) basis.

Fire Effects Plot Workload 2009

Channel Islands National Park

The crew visited Santa Cruz Island in order to do Year 03 reads of the plots installed in the Cruz wildfire, which is on Nature Conservancy property. This is a collaborative study of island shrub regeneration after fire, and instead of FMH protocols, uses methods modified from a sampling design created by Jon Keeley. With the flexibility offered by FFI, the SAMO fire effects monitor was able to create data entry protocols for these sampling methods, and all of the data have now been entered into FFI. The SAMO monitor also assisted with the field work, and SAMO staff did some of the data entry.

Park: Channel Islands

Monitoring Type Name	Number of Plots Read in 2009			Total # of Plots, by Monitoring Type	
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)	Burn	Control
SRI Coastal Sage Scrub (<i>Artemisia</i>)				7	14
SRI Coastal Grassland (<i>Nassella</i>)				9	10
SCI Fennel				5	0
SCI Mixed Fennel				7	0
SCI Fennel Regeneration			2	2	0
SCI Mixed Coastal Sage Scrub				6	0

SCI CSS Regeneration			6	6	0
SCI Island Manzanita				5	0
SCI Island Scrub Oak				6	0
Total Plots for 2009	0	0	8		
Total Number of Plots Installed to Date				53	24



Crater Lake National Park

CRLA is part of the Klamath-Cascades network, so the table below shows only the plot reads that the Central and Southern California fire effects (FEM) crew did. Two trips were taken to CRLA, to read plots burned in the 2007 Cornerstone Prescribed Burn, and to install new plots in the Phoenix burn unit. The FEM also entered the data into the FFI database. The two Klamath fire effects monitors assisted with the field work, and the new lead monitor came out one day as well.

Park: Crater Lake

Monitoring Type Name	Number of Plots Read in 2009*		
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)
Lodgepole Pine (various mon. types)			5
White Fir	10		
Total Plots for 2009	10	0	5

*This is the total that the PORE crew did



Golden Gate National Recreation Area

At GOGA, for the mission blue butterfly restoration project, nine plots were installed at two different sites (one in San Mateo County, and the other in Marin County). Each plot had burn, mechanical removal, and control treatments; sampling methods were line-point and density counts. For the control plots, burn boxes were made by a contractor, based on specs provided by the Fire Ecologist. However, neither the burn nor the mechanical treatments were carried out in 2009. The tall fescue (*Festuca arundinacea*, or FEAR) plots in the Marin Headlands were re-read in anticipation of a burn, and new control plots were established there as well. But this burn was also cancelled. The other plots read at GOGA in 2009 were done at the request of Inventory and Monitoring staff, who also provided field assistance. The goal was to examine plant community change over time, and several never-burned FMH plots at both GOGA and PORE provided the perfect opportunity to start this process. The plots read in 2009 were established in approximately 1990 and have not burned since, either because they were control plots or because they were in burn units that were abandoned and not burned. In all, 12 plots were read at GOGA, and 3 at PORE for this project. The data from this sampling effort will help in the development of the Plant Community Change monitoring protocols.

Park: Golden Gate

Monitoring Type Name	Number of Plots Read in 2009			Total # of Plots, by Monitoring Type	
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)	Burn	Control
Northern Coastal Scrub (ARCA)				1	0
Northern Coastal Scrub (BAPI)	2			11	7
Manzanita Chaparral				4	0
Annual Non-native Grassland (BRDI)				25	3
Annual Non-native Grassland (BRDI2)				5	3
Italian Thistle				5	0
Eucalyptus Forest				1	0
Mustard				1	0
Northern Coastal Prairie (NAPU)	9			16	9
Perennial Non-native Grassland (PHAQ)				6	2
Perennial Non-native Grassland (FEAR)	7			4	3
Mission Blue Butterfly*	9			9	plots contain controls
Redwood Forest				9	0
Bay Woodland	1			4	0
Total Plots for 2009	28	0	0		
Total Number of Plots Installed to Date				101	27

*These alternate-method plots have three blocks: burn, mechanical, and control

Joshua Tree National Park

No trips were made to Joshua Tree this year. The park has 12 plots in one monitoring type (as shown in the table), and the ten-year read was done in 2003. No new burns or plot work are planned.

Park: Joshua Tree

Monitoring Type Name	Number of Plots Read in 2009			Total # of Plots, by Monitoring Type	
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)	Burn	Control
Black Brush Scrub				10	2
Total Plots for 2009	0	0	0		
Total Number of Plots Installed to Date				12	

Pinnacles National Monument

The FEM crew made one trip to Pinnacles to install new yellow starthistle (*Centaurea solstitialis*, YST) plots in the Bottomlands burn unit. The method was designed and the sampling overseen by Brent Johnson, PINN Botanist. The point-frame method was used to assess vegetative cover, and counts were made of starthistle in its different growth stage categories. The plots included both burn and control blocks, though many of the control plots also burned. PINN staff collected immediate post-burn data from the YST plots. The SAMO fire effects monitor designed data-entry protocols so that these alternate-method data could be entered into FFI. There were also FMH-style starthistle (CESO) plots in the Bottomlands unit, but time allowed only two to be read post-burn. The FMH starthistle plots in the Entrance Meadow unit were also read (though that unit was not burned this year).

Park: Pinnacles

Monitoring Type Name	Number of Plots Read in 2009			Total # of Plots, by Monitoring Type	
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)	Burn	Control
Chamise Chaparral				26	0
Mixed Chaparral				28	0
Blue Oak Woodland				16	0
Yellow Starthistle (CESO)*	10	2	5	8	2
Yellow Starthistle alt. meth. (YST)	12	8	10	10	2
Total Plots for 2009	22	10	15		
Total Number of Plots Installed to Date				92	

* Two of the original 12 plots were eliminated, one (a burn plot) due to being in a helicopter landing zone and the other (a control plot) because it was in the path of a water well installation project.

Point Reyes National Seashore

At PORE, the DECE (*Deschampsia cespitosa*) and PIMU (*Pinus muricata*, brush method) plots that burned in 2008 as part of the Limantour fuel break received their year 01 read. A new PIMU control plot was installed to replace one that was too deep in poison oak. All of the French broom (GEMO2) plots were re-read, in anticipation of a burn. And, as mentioned in the GOGA section above, three long-established control plots in coyote brush (BAPI) were read as part of a project to look at community change. No burns were carried out in the park in 2009. However, mechanical fuel reduction by the Hazard Fuel Crew continues, and some of this work was documented by the FEM crew through the use of photomonitoring at permanent points. As they did in 2007, the FEM crew contributed a sizable effort towards an ongoing study of SOD in the park, by assisting U.C. Berkeley researchers to conduct field work at PORE.

Park: Point Reyes

Monitoring Type Name	Number of Plots Read in 2009			Total # of Plots, by Monitoring Type	
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)	Burn	Control
Non-native Annual Grassland (LOPE)				22	14
Non-native Perennial Grassland (PHAQ)				4	3
Non-native Grassland with Scotch Broom				18	0
Non-native Grassland with French Broom			13	13	0
Perennial Grassland: <i>Deschampsia</i>			7	4	3
Northern Coastal Scrub (BAPI)			3	6	4
Bishop Pine (forest plots)				3	0
Bishop Pine (brush plots)			6	3	3
Douglas Fir				1	0
Eucalyptus				5	0
Total Plots for 2009	0	0	29		
Total Number of Plots Installed to Date				79	27

Santa Monica Mountains National Recreation Area

In 2009 the PORE crew made one trip to SAMO and conducted year 04 reads of shrub plots burned in the 2005 Topanga Fire. The table below shows these reads, as well as all of the other FMH plots located at SAMO. The rest of the work done at SAMO will be detailed in the report submitted by the Mediterranean Network.

Park: Santa Monica Mountains

Monitoring Type Name	Number of Plots Read in 2009			Total # of Plots, by Monitoring Type	
	Pre-burn	Immediate Post	Postburn, (1-20 yrs)	Burn	Control
<i>Avena fatua</i> Non-native Annual Grassland				10	1
<i>Bromus diandrus</i> Non-native Annual Grassland				10	0
Non-native Annual Grassland (ANGR)				16	8
<i>Phalaris aquatica</i> Non-native Perennial Grassland				10	0
<i>Distichlis spicata</i> Native Perennial Grassland				1	0
<i>Nassella pulchra</i> Native Perennial Grassland				8	0
Mustard				0	1
Forb (non-native annuals and herbaceous perennials)				16	0
Sagebrush Coastal Sage Scrub			2	16	0
Laurel Sumac Coastal Sage Scrub				1	0
Chamise Chaparral			6	16	0
Big-pod Ceanothus				11	0

Chaparral					
Greenstem Ceanothus Chaparral				5	0
Hoary-Leaf Ceanothus			1	1	0
Eastwood Manzanita Chaparral				1	0
Black Sage Chaparral*				1	0
Oak Woodland				11	1
Burn Severity				30	0
Total Plots for 2009	0	0	9		
Total Number of Plots Installed to Date				166	11

* One SAME plot has been converted back to its original monitoring type of ADFA

Whiskeytown National Recreation Area

The FEM crew traveled to Whiskeytown, and spent a pay period conducting composite burn index (CBI) plots, led by the Redwood (Westside Klamath) fire effects crew. Working in three pairs, the combined crews covered a lot of ground in the 2008 Motion and Whiskeytown Complex wildfires, and completed a large number of CBI plots.



PORE and REDW crews after last dinner in Redding

Management Objectives and Monitoring Results 2009

Data are presented only for PORE because that is the only network park to have any prescribed fire treatments completed in 2008 and thereby data available for analysis in 2009.

Park: Point Reyes NS

Monitoring Unit	Management Objective	Monitoring Results (90% CI)	Objective Achieved?
Native Coastal Prairie (DECE): Limantour Fuel Break	Maintain or increase cover of native species (1°)/Maintain or decrease cover of non-native grasses (2°)	1°: Significant increase (25%) increase in native cover 2°: No significant difference in non-native grass cover between burn and control plots (n=4 burn plots; n=3 control plots)	1°: No 2°: Yes
Bishop Pine (PIMU): Limantour Fuel Break	Maintain or increase cover of native species (1°)/Maintain or decrease cover of non-native grasses (2°)	1°: No significant change in native cover 2°: No significant change in non-native grass cover (n=3 burn plots; n=2 control plots)	1°: Yes 2°: Yes

Fire Ecology Staffing 2009

Monitor	Starting Date	Ending Date	# of Pay Periods	Training and Development
<i>Alison Forrestel</i>	<i>n/a</i>	<i>n/a</i>	26.5	
Wende Rehlaender	1-1-09	1-10-09	23.5	HAZWOPER, all-risk READ (5 days total)
	2-21-09	1-2-10		
Nathan Cofer	4-15-09	10-10-09	12.5	S-130, S-190
Christopher Pearce	4-16-09	7-4-09	5.5	
Dylan Voeller	8-5-09	10-2-09	4.5	

Accomplishments and Focus Areas for Fire Ecologists and Fire Effects Monitors

Bay Area Fire Ecologist

Category	% Time	Accomplishments/Focus Area
----------	--------	----------------------------

General Planning	15%	- Assisted with planning and project review for PORE fuels projects - Assisted with planning and project review for PORE, PINN and GOGA joint natural resources management projects - Worked with SAMO and regional office staff to coordinate configuration of fire effects program for SFAN and Mediterranean Coast networks
Presentations and Other Outreach	14%	- Poster presentation on <i>Spatial Distribution and Impacts of Phytophthora ramorum and Sudden Oak Death in Point Reyes National Seashore</i> at the I&M Science Symposium - Poster presentation on <i>Post-fire Vegetation Changes at Point Reyes National Seashore</i> at the California Association for Fire Ecology Meeting - Contributed to presentation on Marin manzanita by PRNS fire planner at CNPS annual meeting - Assisted with various in-park trainings in fire ecology
NPS Meetings / Task Groups	10%	- Facilitated regular meetings/fieldtrips for PORE fire & resource management staff - Initiated regular meeting for GOGA fire & resource management staff
Fire Assignments and Fuels Projects	1%	Assisted with PINN Bottomlands RX fire
Research	15%	- Completed 2009 remeasurement of Sudden Oak Death long term monitoring plots. - Secured USFS Forest Health Protection funding for SOD early detection at PINN - Worked with PINN staff, UC Berkeley researchers and tribal members on a JFSP proposal to examine Native American use of fire at PINN
Monitoring Field Work	5%	Assisted with field work at PORE
Data Analysis	5%	Completed FMH monitoring analysis
Supervision/Admin	25%	- Supervised lead monitor - Travel & time paperwork - Administered CESU agreement with UC Berkeley
Training & Professional Development	5%	Fire refresher

Miscellaneous	10%	Assisted National Fire Ecology Program with FFI trainings in Boise and Portland

Fire Effects Crew

Category	Percent Time		Accomplishments/Focus Area
	Crew	Lead	
Vegetation Plots (FMH and other methods)	40%	18%	Includes travel time to away parks
Other Field Projects	14%	5%	- Field work for a SOD research project at UC Berkeley (14 people-days) - WHIS trip for CBI plots (one pay period, 3 people) - Pulled weeds (6 people-days) - Fish and rare plant monitoring (2 people-days) - GPS'd mowed areas at PORE; downloaded to GIS (1 person-day) - Photomonitoring of fuels reduction projects at PORE and GOGA (2 people-days)
Fire Assignments	<1%	<3%	- Lead Monitor was FEMO on a prescribed burn at PINN (1 day) and wrote burn report. Seasonal (not yet red-carded) observed. - Lead Monitor participated in prescribed burn with a local agency (1 day) - Lead Monitor traveled to CRLA for a burn, but it was cancelled (3 days includ. trav.)
Data Entry, Slide & Photo Labeling, Keying Vouchers, and Miscellaneous Office Work	30%	25%	And for Lead only: work on FFI to maintain databases and to clean up code lists
Supervision and Administration	0%	35%	Hiring, planning, timesheets, travel, and other paperwork, evaluations, preparing for trips, ordering things, annual report, and various other administrative tasks
Meetings	<1%	3%	
Training and Development	7%	7%	Fire refresher, training and development as noted in previous table, regular PT
Orientation and Informal Training	8%	4%	Learning and teaching