



Yosemite National Park Fire Ecology Annual Report Calendar Year 2013

A. Summary

This year was the first in recorded history that Yosemite did not have a fire effects crew reading plots all summer. Funding to the park was not adequate to support a crew but did fund the Fire Ecologist for 26 pay periods and the Lead Fire Effects Monitor for 13 pay periods. Despite the lack of crew, Yosemite got a lot of backlogged projects initiated and accomplished. The Southern Sierra also had an historic fire year which claimed a lot of time from the Fire Ecologist.

Three fires burned adjacent to the Park this summer that impacted park employees or burned directly into the Park. The Carstens Fire started in August by an abandoned campfire and burned ~2,500 acres near Mariposa and Bootjack. Many Yosemite employees were evacuated from their homes until the fire was controlled. The Aspen Fire burned ~ 25,000 acres on the High Sierra District of the Sierra National Forest, in the San Joaquin River valley. Lastly, the Rim Fire burned ~ 250,000 acres on the Stanislaus National Forest and Yosemite National Park. The Rim Fire was the 3rd largest fire in California history and the largest fire in the Sierra Nevada.

Karen Palmer, Lead Fire Effects Monitor, and her husband Zack, Assistant Captain left the park for a job in Utah in May. Karen had just completed her 13 pay periods of work through the winter and left the park with several important projects completed.

A second paper on the 2010 LiDAR data acquisition was published in Remote Sensing of Environment with the Fire Ecologist as a co-author. The paper details the patterns of canopy gaps, tree clumps, and single tree arrangements in forest structure created by fire severity.

Karen Palmer and Gus Smith attended the Association for Fire Ecology Congress in Portland, Oregon, and both gave several presentations to a variety of groups throughout the year.

Despite the great fire assignments in the Park and in neighboring National Forests, the most exciting event of the year was fuels moisture sampling, new fuel moisture database, and upload of 20 years of Yosemite fuel moistures into the National Fuel Moisture Database. Gus took the lead on supervising fuel sampling and data entry this year and Karen took the lead on getting data ready for the National Fuel Moisture Database. Data quality this year was high and had the

lowest variability between samples ever. We are 90% complete with beta testing the new Access Database and will be operational in 2014.

Table 1. Fire Effects Plot Workload (2013) and Total Plots Installed

Park	Monitoring Unit	Plot Type (FMH Forest/Brush/Grass plot, photo point, Rapid Assessment, CBI, etc.)	Pre-burn 2012	Immed. Post 2012	Postburn (1-20 yrs) 2012	Annual Total (2013)	Total Plots
YOSE	White fir – mixed conifer	FMH Forest plot	0	0	0	0	25
YOSE	Ponderosa pine – bear clover	FMH Forest plot	0	0	0	0	18
YOSE	Giant Sequoia	FMH Forest plot	0	0	0	0	13
YOSE	Meadow – YOSE valley	FMH Grass plot	0	0	0	0	8
YOSE	Ponderosa pine – mixed conifer	FMH Forest plot	0	0	0	0	7
YOSE	Incense cedar – mixed conifer	FMH Forest plot	0	0	0	0	3
YOSE	Red fir – mixed conifer	FMH Forest plot	0	0	0	0	2
YOSE	Mixed conifer	Retro fuels	0	0	0	0	41
YOSE	Mixed conifer (YOSE valley)	Retro fuels	0	0	0	0	41
YOSE	Mixed conifer – red fir	Retro fuels	0	0	0	0	20
Total			0	0	0	0	178

Table 2. Fire Ecology Staffing 2013

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Gus Smith	01/01/2013	12/31/2013	26	Yes	AFE Annual Conference, Yosemite Leadership Academy
Karen Palmer	09/01/2012	4/19/2013	13	Yes	READ, Supervisors training

Table 3. 2013 Management Objectives and Monitoring Results

Monitoring Unit	Management Objective (Restoration)	Monitoring Results Mean (80% confidence intervals of the mean)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
White fir – mixed conifer forest (n = 9 plots; Re02Year10)	Density: 20-89 trees/acre < 31.5” dbh 4-20 trees/acre > 31.5” dbh	98 trees/acre < 31.5” (+/- 85.5) 11 trees/acre > 31.5” (+/- 6.6) (n = 8, removed an outlier plot): 53 trees/acre < 31.5” (+/- 44.7) 12 trees/acre > 31.5” (+/- 6.5)	(n = 9) NO for trees < 31.5” YES for trees > 31.5” (n = 8) YES	2012 (2007-2012)

Monitoring Unit	Management Objective (Restoration)	Monitoring Results Mean (80% confidence intervals of the mean)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
	Species composition: 40 – 65% fir, 15 – 50% pine, 0 – 10% cedar	a) <u>trees < 31.5"</u> and 9 plots = 75% fir, 18% pine, 7% cedar b) <u>trees > 31.5"</u> and 9 plots = 48% fir, 40% pine, 12% cedar c) <u>trees < 31.5"</u> and 8 plots = 75% fir, 14% pine, 11% cedar d) <u>trees > 31.5"</u> and 8 plots = 48% fir, 39% pine, 13% cedar	a) NO, fir is too high b) NO, cedar is a bit high c) NO d) NO	2012 (2007-2012)
Ponderosa pine – bear clover forest (n = 13 plots; Re02Year05)	No density or species composition objectives identified in FMP	88 trees/acre < 31.5" (+/- 85.2) 8 trees/acre > 31.5" (+/- 11.5)	N/A	2012 (2007-2010)
		a) <u>trees < 31.5"</u> = 42% pine, 41% cedar, 17% black oak b) <u>trees > 31.5"</u> = 80% pine, 16% cedar, 4% black oak	N/A	2012 (2007-2010)
Giant Sequoia – mixed conifer forest (n = 2 plots; Re01Year02)	Density: 20-101 trees/acre < 31.5" dbh 4-26 trees/acre > 31.5" dbh	53 trees/acre < 31.5" (+/- 34.5) 10 trees/acre > 31.5" (+/- 4.5)	YES *but sample size too small	2012 (1998-2010)
	Species composition: 35-65% fir, 0-20% sequoia, 40-55% pine	a) <u>trees < 31.5"</u> = 85% fir, 8% cedar, 4% sequoia, 4% pine b) <u>trees > 31.5"</u> = 63% fir, 21% cedar, 16% sequoia, 0% pine	NO	2012 (1998-2010)
Red fir – mixed conifer forest (n = 2 plots; Re01Year10)	Density: 20-202 trees/acre < 31.5" dbh 4-30 trees/acre > 31.5" dbh	30 trees/acre < 31.5" (+/- 16.8) 20 trees/acre > 31.5" (+/- 12.9)	YES *but sample size too small	2012 (2012)
	Species composition: 70-100% fir, 0-30% pine	a) <u>trees < 31.5"</u> = 100% fir, 0% pine b) <u>trees > 31.5"</u> = 100% fir, 0% pine	YES	2012 (2012)
Ponderosa pine – mixed conifer forest (n = 2 plots; Re02Year01)	Density: 4-91 trees/acre < 31.5" dbh 4-30 trees/acre > 31.5" dbh	16 trees/acre < 31.5" (+/- 12.3) 20 trees/acre > 31.5" (+/- 7.6)	YES *but sample size too small	2012 (2006-2010)
	Species composition: 60-95% pine, 15-40% cedar, 1-10% oak	a) <u>trees < 31.5"</u> = 87.5% fir, 12.5% pine, 0% cedar, 0% oak b) <u>trees > 31.5"</u> = 70% pine, 30% cedar, 0% oak	a) NO, fir is present in high % b) YES, but no oak	2012 (2006-2010)

Monitoring Unit	Management Objective (Restoration)	Monitoring Results Mean (80% confidence intervals of the mean)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
Incense cedar – mixed conifer forest (n = 3 plots; Re01Year10)	No density or species composition objectives identified in FMP	94 trees/acre < 31.5” (+/- 47.8) 7 trees/acre > 31.5” (+/- 4.8)	N/A	2012 (2009)
		a) trees < 31.5” = 54% cedar, 36% fir, 10% pine b) trees > 31.5” = 100% pine, 0% fir, 0% cedar,	N/A	

B. Fire ecologist accomplishments and areas of focus

Table 4. Fire Ecologist 2013 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	20%	- Fire Management Plan CE – author - Minimum Requirement Analysis for Fire and Aviation Management in Yosemite National Park - National Fuel Moisture Database, - construction of Park Access fuel moisture database
Presentations	< 1%	- Southern California Prescribed Fire Council – “Why the Rim Fire was unprecedented” 2013 READ training presentation - several presentations and field trips with UC-Merced, California Polytechnic Institute, UC-San Diego - Co-hosted Malcolm North’s Sierra Nevada Fire Ecology field trip in Yosemite
NPS Meetings/ task groups	5%	- Yosemite Fire-Hydro-Climate workshop (cancelled due to Government shutdown) - Fire Management Committee
Interagency work	5%	- Southern Sierra Pacific Fisher Working Group - AFE annual Board of Directors meeting - quarterly California Fire Science Consortium Advisory Board Meetings - Malcolm North’s Sierra Nevada Fire Ecology Field Trip in Yosemite - Rim Fire Restoration Planning (with Stanislaus National Forest, Sierra Nevada Legacy, Sierra Nevada Conservancy, Pacific Southwest Research Station)
Wildfire assignments	5%	- Carstens Fire (READ) - Aspen Fire (Lead READ) - Rim Fire (READ)
Prescribed fire projects	1%	- Wawona Northwest RX: preplanning with fire managers, - READ during burn unit prep. - FEMO for 2 shifts on the prescribed burn.

		• READ for the Yosemite Valley units 11&16 but never burned.
Non-fire fuels projects	< 1%	• One field trip to observe the mechanical treatment in Foresta along Crane Creek for wildlife concerns
Research	25%	• Global Climate Change Initiative funded Carbon project • Fuels Reserve funded Carbon project • Fuels Reserve funded LiDAR project • Coordination for Yosemite Forest Dynamics post Rim Fire plot read, Ohio State University researcher Maziaka Sullivan and Breezy Jackson, Jet Propulsion Laboratory ground truthing • Rim Fire LiDAR and AVRIS data acquisition
Data collection	10%	• No Fire Effects data collected in 201 • I frequently sampled fuel moistures to teach the protocol to others
Data entry	2%	• Fuel Moisture data – entered most of the seasonal data
Data analysis	2%	• Fuel moisture data seasonal summary and 20 year history • Developed analysis of all the tree tags and rebar and other monuments in Wilderness for the Wilderness Stewardship Plan
Supervision/Admin	10%	Supervision, budget, payroll, travel, BAER budget supervision,
Training	2%	Yosemite Leadership Academy
Travel out-of-park for plot or project work	0%	None
Miscellaneous/Rim Fire	>10%	Agreements with UW, USU, and CalFire, BAER and BAR supervision, funding proposal writing (5 proposals written), Rim Fire aftermath (media, field trips, webinars, and presentations)

C. Fire effects crew accomplishments and areas of focus

We did not hire a crew in 2013 due to NPS Regional direction.

Table 5. Fire Effects Lead 2013 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	0%	No plots visited in 2013
WUI plots	0%	
CBI plots	0%	
Other plot work	0%	
Wildfire assignments	0%	
Prescribed fire projects	5%	FEMO and HECM
Non-fire fuels projects	75%	Created the Plot photo database, proofed 20 years of fuel moisture data with Fire Ecologist and uploaded it to the National Fuel Moisture Database, Co-developed a park Access Database for fuel moistures,
Travel out-of-park for plot or project work	0%	
Data entry	10%	Estimated amount of time spent entering data from paper to PC
Data analysis	5%	
Supervision/Admin	<5%	Payroll, travel authorization/voucher, etc.
Training	2%	AFE Conference
Miscellaneous	0%	

D. Additional Program Information

Table 6. Planning - 2013

Park	Does Park have written DFCs? (yes or no)	Date Park-level Monitoring Plan completed (or revised)	Total # of Project- or Community-level Monitoring Plans (not just 2013)	Assisted with how many BAER plans in 2013?
Yosemite	No	No	None	none

Table 7. Monitoring - 2013

Park	% 2013 Data Entered	% 2013 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Yosemite National Park	100%	100%	1	0	2	1

Table 8. Communicating Results - 2013

Park	# of Project Monitoring Reports completed in 2013	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Yosemite National Park	1	12 ¹	2	Yes

¹We meet more frequently than annually so this is the number of meetings I attended with park managers related to fire operations and management.

Table 9. Research - 2013

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2013	# of Proposals Funded in 2013	# of Research Projects Supported in 2013*	Additional Comments
Yosemite National Park	yes	6 ¹	3 ²	6 ³	

*Number of funded research projects, new or ongoing, supported by the fire ecology program including logistical info or support, staffing, etc.

¹Identifying structural characteristics of Pacific Fisher habitat and whether fire conserves these features (1 proposal reviewed by ENRAC, 1 rewritten and submitted for Yosemite Conservancy funding). Post Fire Read of the Yosemite Forest Dynamics Plot (Suppression funding), GIS data layer acquisition for Rim Fire Geodatabase (Suppression funding), Opportunistic plot read of Rim Fire plots (Suppression funding), and Assessing fuel treatment effects of Rim Fire (JFSP with Brandon Collins and Matt Brooks).

²All three Suppression funding proposals were funded. JFSP proposal submitted and should hear whether it was funded in April. Two fisher proposals were not funded (though should be).

³Fire Ecologist and collaborators completed the final report for the NPS Fuels Reserve funded Static Carbon project, continued work on the dynamic carbon project, coordinated logistics for Ohio State University fire severity and stream geomorphology and food chain length study, and Jim Lutz' Yosemite Forest Dynamics Plot. I also facilitated a lot of research after the Rim Fire. I worked with Carlos Ramirez, USFS PSW to get complete LiDAR coverage of the Rim Fire, worked with Jet Propulsion Laboratory to collect data on the ground to ground-truth the LiDAR and AVRIS data, Jim Lutz and Andrew Larson to get into the Yosemite Forest Dynamics Plot, Kate Wilkin from UC-Berkeley to collect her climate sensors that burned in the Rim Fire and other scientists needing to get into the Rim Fire for data collection.

Reserve Fund Research: If your park(s) received Reserve Fund Research funding or completed a previously-funded project in the last year, please provide the following:

- Static Carbon: We included data from this project in a final report to the Global Climate Change Initiative. Project will be complete 31 August 2014. One peer reviewed paper will result from this work.
- Dynamic Carbon: Jim Lutz' graduate student will work on the tree cores this winter and have that data available for analysis this summer. We should complete the project by April 2015. Four peer reviewed publications will result from this work as well as curriculum for school groups and public groups that visit the park, and a "teachers' packet" for fire ecology.
- LiDAR: Van and co-authors completed another manuscript that was accepted by Remote Sensing of Environment. We are working on another publication to compare the 120 acquisition to the Illilouette LiDAR acquisition to show environmental controls on forest structure and fire severity. This will be a REALLY great paper!

Also, if a Reserve Fund research project is completed, please remember to submit an article to the Rx Effects newsletter by the last Friday in February (see <http://www.nps.gov/fire/wildland-fire/what-we-do/science-ecology-and-research/rx-effects-newsletter.cfm> for submission guidelines).

E. 2014 Direction

I plan to accept a detail with the Sierra National Forest in early 2014 as a Deputy District Ranger for the High Sierra Ranger District. I have developed a plan to bring the PWR Lead Fire Effects Monitors to Yosemite to do a post burn and year 01 read on the 106 plots that burned in the Rim Fire. I plan to complete the beta testing of the fuel moisture database, train supervisors how to use it and train them to use the fuel moisture collection protocol.

If our Joint Fire Sciences Program proposal is funded I will have a lot of responsibility managing field work and data gathering and analysis.

Beyond these immediate tasks, I think it is accurate to say that the Yosemite Fire Ecology program is in transition. National/Regional direction will help us develop long term plans.

F. Optional Information

G. Metadata and FFI Database Update on NPS Data Store

INSTRUCTIONS FOR UPLOADING 2013 ANNUAL REPORT TO SHAREPOINT

1. Save your report as a PDF file using the following file naming convention “2013 *Park/Network Name* Annual Report.pdf”.
2. Go to the NPS Fire Ecology Sharepoint site (<http://famshare.inside.nps.gov/wildlandfire/firescience/fireecology/default.aspx>). In Fire Ecology Documents, upload your report to the 2013 Park and Network Fire Ecology Program Annual Reports folder.
3. Please e-mail your regional ecologist, Nate Benson, and MaryBeth Keifer to let us know when you get your report uploaded.

Call MaryBeth Keifer (603-795-2333) or Nate Benson (208-387-5219) if you have any questions or problems.