



**National Park Service
Fire Ecology Annual Report
Southern Utah Parks Group
Calendar Year 2013**



A. Summary

The Southern Utah Parks Group had a challenging yet safe and productive year in 2013. The field staff consisted of a permanent GS-07 lead fire effects monitor, Katie Walsh and one seasonal GS-06 assistant lead fire effects monitor, Liz Dodson. The program proceeded this year without a fire ecologist, additional seasonal crew members, or an assigned vehicle to complete fieldwork. Without a fire ecologist the fire effects program lacks direction, a funding advocate and guidance. Without new project proposals or input, the crew was only able to focus on reading plots already installed and scheduled. During the 2013 field season, the crew completed close to all scheduled FMH plots: 17 at Zion NP and 24 at Bryce Canyon NP. They also completed wildland fire risk assessments of 140 structures at Zion NP and Cedar Breaks NM.

The 620 acre Clear Trap prescribed burn was completed early spring along the east border of the park to provide better defensible space and reduce fuels in the unit. Post-burn reads were completed on the 3 Ponderosa, 2 Juniper, and 1 Gambel Oak FMH plots in the unit. Zion Engine 611 and 612 assisted with the post reads for all 6 FMH plots. The fire effects crew served as FEMO on the burn for the two days of ignitions and six days of holding, monitoring and mop-up. They worked with Bandelier FUM to provide daily summaries of fire activity and weather observations and produced a final report.

The crew spent 16 days over three hitches camped at Bryce to complete fieldwork. To assist the crew with monitoring, volunteers from other departments in Zion and Bryce Canyon were relied on to help collect data. Thirteen volunteers were trained on monitoring techniques and used throughout the summer. While it is important and useful to train others in FMH plot protocols it was also time consuming and allowed for inconsistencies within the data collection.

The structure assessment process was made more efficient this year when the database and data dictionary template was made available digitally on Trimble GPS units and NPMMap database. Another digital advance for the crew was the use of an iPad. The iPad was loaded up with digital guides, plant keys, maps, and fire resource guides. All the data collected this season was FMH plot reads and had to be collected on paper in the field and entered into FFI at the office. Ideally the iPad could be used in future seasons for field data collection. The iPad was very handy for monitoring and documentation during the Clear Trap RX. Weather and fire behavior observations were entered into an iPad report document while in the field.

Both Katie and Liz were able to participate in at least one detail assignment and worked on a wide range of wildland fire skills. Crew members also assisted the Zion wildland fire engines with several small fires in Zion NP and the local Color Country Interagency Area. Zion was in severity for several weeks, but received an abundance of monsoonal moisture in August and September. The fire effects program was also able to continue supporting plant identification training with assistance from the Zion Natural History Association and the Zion Vegetation Program. All crew members participated in 20 hours of plant identification and herbarium skills training.

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

Park	Monitoring Unit	Plot Type (FMH Brush plot, photo point, CBI, etc.)	Pre-burn	Immed. Post	Post-burn (1-20 yrs.)	Annual Total	Total Plots
Zion	Ponderosa Pine	FMH Forest Plot	-	3	6	9	19
Zion	Sagebrush	FMH Brush Plot	-	-	2	2	20
Zion	Gambel Oak	FMH Forest Plot	-	1	2	3	12
Zion	Juniper Woodland	FMH Forest Plot	-	2	1	3	8
Zion	Aspen	FMH Forest Plot	-	-	-	-	10
Zion	White Fir	FMH Forest Plot	-	-	-	-	10
Zion	Kolob Fire	Cheat grass treatment plots	-	-	-	-	140
Bryce	White Fir	FMH Forest Plot	-	-	14	14	18
Bryce	Ponderosa Pine	FMH Forest Plot	-	-	10	10	23
Bryce	Black Sage	FMH Brush Plot	-	-	-	-	7
Bryce	Dave's Hollow RX	Tree Density Ponderosa Pine	-	-	-	-	15
Bryce	Dave's Hollow RX	Photo Points	-	-	-	-	3
Bryce	Lodge Thinning	Photo Points	-	-		-	7
Golden Spike	Sagebrush	FMH Brush Plot	-	-	-	-	10
Total FMH	---	FMH Plots	-	6	35	41	137
Plot Total	---	All Plot Types	122	-	187	316	429



Blackline ignitions on the Cleartrap RX

Table 2. Fire Ecology Staffing 2011

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Katie Walsh Lead Monitor	1/28/2013	11/14/2013	20	Yes	RX-310, Botany training, Red-card refresher, Operational Leadership
Liz Dodson Monitor	5/6/2013	9/30/2013	10.5	No	Botany training, Red-card refresher, L-280, Completed FEMO taskbook

Table 3. Management Objectives and Monitoring Results

Table 3a Zion National Park Management Objectives and Monitoring Results 2013

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (20% confidence interval)	Objective Achieved?	Year of Analysis
Ponderosa Pine FPIPO1T09	Reduce needle and duff layer by 40-60% (immediate post-burn)	1 st burn, reduction: 43 to 67% (<i>n=19 plots</i>) 2 nd burn, reduction: 38 to 69% (<i>n=13 plots</i>)	Yes; perhaps slightly over-achieved Yes; perhaps slightly over-achieved	2009 (1995-2009)
	Attain 30-60% mortality of live ponderosa pine 4-8" DBH (5 years post-burn)	1 st burn, mortality: 20 to 41% (<i>n=17 plots</i>)	Yes, perhaps slightly low	2011 (1995-2011)
	Reduce 1,000 hour fuels by 40-80% (immediate post-burn)	1 st burn, reduction: 3% INCREASE to 31% DECREASE (<i>n=19 plots</i>) 2 nd burn reduction: 11 to 91% (<i>n=13 plots</i>)	No Uncertain; minimum sample not achieved	2009 (1995-2009)
	Lower brush cover height by 40% (1 year post-fire)	1 st burn, reduction: 15 to 40% (<i>n=18 plots</i>) 2 nd burn, reduction: 6 to 45% (<i>n=12 plots</i>)	No No	2009 (1995-2009)
Quaking Aspen FPOTR1T02	Reduce fuel load 40-70% immediate post- burn	1 st burn total fuel reduction: 4 INCREASE to 4% DECREASE (<i>n=7 plots</i>)	No; aspen groves barely burned	2009 (1998-2009)
	Reduce live overstory tree (POTR) density 20-50% within 5 years post-burn	1 st burn, reduction: 26 to 46% (<i>n=9 plots</i>)	Yes, BUT NOT DUE TO FIRE; Rx burn was too damp to ignite the aspen groves.	2009 (1998-2009)

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (20% confidence interval)	Objective Achieved?	Year of Analysis
	Increase seedling and pole density/regeneration 15-40% within 5 years post-burn	Pole density: 7% INCREASE to 66% DECREASE (<i>n=9 plots</i>) Seedlings density: 46 to 192% increase (<i>n=9 plots</i>)	No; minimum sample not achieved; no fire in groves. Yes, BUT NOT DUE TO FIRE; no fire in groves; also, minimum sample not achieved.	2009 (1998-2009)

White Fir FABCO1T10	Reduce fuel load 50-80% immediate post-burn	Total fuel reduction = 28 to 70% (<i>n=4 plots</i>)	Borderline; 49% mean fuel reduction	2009 (1998-2009)
	Limit the reduction/mortality of overstory trees (ABCO) to 30-50% within 5 years post-burn	Overstory reduction = 14 to 118% (<i>n=3 plots</i>)	Uncertain; minimum sample not achieved	2009 (1998-2009)
Gambel Oak FQUGA1T06	Reduce total fuel load 30-80% immediate post-burn	Fuel Reduction: 29 to 54% (<i>n=11 plots</i>)	Yes	2009 (1997-2009)
	Reduce oak (QUGA) density of all size classes by 25-80% in 1 year	Seedling increase: 45 to 154% (<i>n=11 plots</i>) Pole size reduction: 22 to 65% (<i>n=11 plots</i>) Overstory reduction: 3 to 59% (<i>n=11 plots</i>)	No, <i>increased</i> seedlings; re-sprouts and seedlings are both included in this count; also, minimum sample not achieved Yes, but minimum sample is borderline. No, but minimum sample not achieved	2009 (1997-2009)
	Limit ponderosa overstory mortality to <50% within 2 years	Reduced by 5 to 28% (<i>n=18 plots</i>)	Yes	2009 (1997-2009)
Juniper and Pinyon FJUOS1T06	Reduce overstory tree density by 20-40% within 1 year post-burn	Reduced by 4 to 33% (<i>n=8 plots</i>)	No	2009 (1999-2009)

	Reduce brush density by 5-25% within 1 year post-burn	Brush reduction: 6 to 76% (<i>n=8 plots</i>)	Probably, but minimum sample not achieved	2009 (1999-2009)
	Reduce seedling and pole sized trees by 5-20% within 1 year post-burn	Seedling reduction: 16 to 44% (<i>n=8 plots</i>) Pole reduction: 10 to 62% (<i>n=8 plots</i>)	Probably, but minimum sample not achieved Uncertain; minimum sample not achieved	2009 (1999-2009)
Sagebrush BARTR1T06	Reduce brush density by 40-80% within 2 years post-burn	Brush density reduction: 49 to 80% (<i>n=10 plots</i>)	Yes	2009 (1997-2009)
	Increase native grasses and forbs in 5-10 years by >10% cover	Increase in cover 10 yrs post fire: 27 to 112% (<i>n=6 plots</i>)	Yes, but minimum sample not achieved; need to review how well pre-fire grass ID was conducted too.	2009 (1997-2009)
Brome GBRDI1T02	Reduce Ripgut Brome (BRDI) and Cheat grass (BRTE) density 100%	81% decrease in BRDI at YR02 1232% increase in BRTE at YR02 (<i>n=4 plots</i>)	NO – Partial decrease in rip gut brome offset by dramatic increases in cheat grass and Russian thistle (overall non-native density decreased by 29%)	2009
	Increase relative cover of native vegetation 30-40% within 5-10 years post-treatment	51% increase at YR02 (<i>n=4 plots</i>)	YES – Over-achieved by increasing relative cover more than expected (no year 5 data yet—analysis run with year 2 data)	2009

Table 3b. Bryce Canyon National Park Management Objectives and Monitoring Results 2011

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (20% confidence interval)	Objective Achieved?	Year of Analysis
Ponderosa Pine FPIPO1T09	Reduce total fuel load by 30-60% within immediate post-burn	2 nd entry burn: 14 to 88% decrease (<i>n=10 plots</i>) 3 rd entry burn: 7% INCREASE to 44% DECREASE (<i>n=5 plots</i>)	Uncertain; minimum sample not achieved No; mean was 18%	2011 (1989-2011)

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (20% confidence interval)	Objective Achieved?	Year of Analysis
	Increase native grasses and forbs by 5-20% within 5 years	2 nd entry burn: 7% DECREASE to 15% INCREASE (<i>n=10 plots</i>)	Uncertain; minimum sample not achieved	2009 (1989-2009)
Ponderosa pine Dave's Hollow	Consume 50 – 100% needle-cast post-burn	1 st entry burn: 36 - 63% decrease (<i>n = 15 plots</i>)	Uncertain; minimum sample not achieved (22 plots)	2011 (2009-2011)
	Reduce pole-sized ponderosa pine by 50% within 2 yrs. post-burn	Undetermined	Undetermined	
Mixed Conifer FABC01G08	Reduce total fuel load by 20-50% immediate post-burn	2 nd entry burn: 22% decrease (<i>n=12 plots</i>)	Yes	2010 (1995-2010)
	Reduce White Fir (<i>Abies concolor</i>) pole density by 10-20% within 2 years post-burn	2 nd entry burn: 31% reduction (<i>n=12 plots</i>)	Yes	2010 (1995-2010)
	Reduce White Fir seedling density by 20-40% within 1 year post-burn	2 nd entry burn: 6 to 42% decrease (<i>n=12 plots</i>)	Yes	2010 (1995-2010)
	Increase Quaking Aspen (<i>Populus tremuloides</i>) seedling density by 30-70% within 2 years post-burn	Only 1 POTR seedling found in 1 plot (<i>n=12</i>)	No	2010 (1995-2010)

Table 4. Fire Ecologist 2013 Accomplishments/Focus Areas

Position Vacant

C. Fire effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew 2013 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	50	17 FMH plots at Zion, 24 FMH plots at BRCA
WUI plots	0	
CBI plots	0	
Other plot work	0	
Wildfire assignments	10	9 shifts spent assisting engine with severity coverage. Lead- 1 two week assignment on Color Country crew Crew member- 1 three week assignment on Color Country crew
Prescribed fire projects	5	Project prep for Clear Trap RX- digging hand line, clearing brush. Assisted with RX as FEMO and holding.
Non-fire fuels projects	10	Complete structure assessments for Zion Canyon and Cedar Breaks.
Travel out-of-park for plot or project work	<2	3 trips to Bryce Canyon, 2 half days travel each.
Data entry	15	Completed all data entry for FMH and structure assessment photos
Data analysis	0	This is expected to be very low number or zero for fire effects crew/lead monitor
Supervision/Admin	<5	Lead hired and supervised seasonal assistant lead employee, time and travel paperwork
Training	5	All attended refresher. L-280, plant ID
Miscellaneous	5	Assist other park work groups with monitoring or surveys. Excessive amount of time spent on logistics for getting to work site due to lack of assigned vehicle.



Reading a ponderosa pine plot at Bryce Canyon NP

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?
Zion National Park	Yes (not refined)	2004	0	0
Bryce Canyon National Park	Yes (not refined)	2004	0	0
Golden Spike National Historic Site	Yes (not refined)	2004	0	0

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*
Zion National Park	100	<5	5	0	0	0
Bryce Canyon National Park	100	<5	3	0	0	0
Golden Spike National Historic Site	N/A	N/A	0	0	0	0

* Number of treatment units with treatment effects monitoring conducted. Include pre-burn and post-burn monitoring but not burn-day monitoring.

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?*
Zion National Park	1	0	0	Yes
Bryce Canyon National Park	0	0	0	Yes
Golden Spike National Historic Site	0	0	0	Yes

* This information will help to assess Minitab multi-user license needs.

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
Zion National Park	Yes	0	0	2	
Bryce Canyon National Park	No	0	0	1	
Golden Spike National Historic Site	Unknown	0	0	0	

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

E. 2014 Direction

Budget uncertainties and lack of program support make planning for future monitoring difficult. Plans for the future will include continuing to work towards sharing data results and information with Fire Management and Resource Management at both Zion and Bryce Canyon. The program needs to continue to initiate protocols that are more fire objective specific. For example, rapid assessment plots can be installed in burn units planned for the near future. Protocols can address specific burn objectives like reducing tree density and fuel loading. By collecting more relevant information and sharing those results in a timely manner, there may be more opportunities for adaptive management.

In order to address future budget constraints the lead would like to explore options like local trainings, hiring interns, and maximizing the efficiency of data collected with electronic field devices like tablets. Continuing to keep the crew fully staffed is preferred by the lead monitor and helps provide more opportunities for all.