



**National Park Service
Fire Ecology Annual Report
Calendar Year 2010**

A. Introduction and Summary

The Fire Ecologist attempts to serve three Fire Management Programs, The Southwest Texas Fire Group (SWTF), The Permian Fire Group and the Southern Plains Fire Group. The Southwest Texas Fire Management Group is composed of Big Bend National Park (BIBE), The Rio Grande Wild and Scenic River (RIGR), Fort Davis National Historic Site (FODA), Amistad National Recreational Area (AMIS) and Palo Alto Battle (PAAL) Field. Most of the fire and fuels activity in the cluster occurs primarily at Big Bend National Park, although we are planning for prescribed fires at Fort Davis and Palo Alto. The Permian Fire Cluster is composed primarily of Carlsbad Caverns and Guadalupe Mountains National Parks, White Sand National Monument and Gila Cliff Dwellings National Monuments and Chamizal National Memorial. Most of the fire and fuels activity occurs primarily at Carlsbad Caverns and Guadalupe Mountains. There are plans for prescribed fire at White Sands and Gila Cliff Dwellings, in the near future. Manual fuel reduction has occurred at Gila Cliff Dwellings focused primarily on archeological sites. The Southern Plains Fire Groups has seven parks that occur in four states. Chickasaw National Recreational Area and Washita Battlefield National Historic Site in Oklahoma, Lake Meredith National Recreational Area and Alibates Flint Quarries National Monument in the Panhandle of Texas, Capulin Volcano National Monument in northeastern New Mexico, and Bent's Old Fort and Sand Creek Massacre National Historic Sites in southeastern Colorado. The Southern Plains Fire Group has active fuels program in most of the parks within the group and is principally responsible for a significant amount of the fuels treatment acreages in the Intermountain Region. There are two fire effects crews that the Fire Ecologist assists either directly or indirectly. The first of crew is the Chihuahuan Desert Fire Crew which serves the Southwest Texas Fire Group and the Permian Group. The Chihuahuan Desert Crew is funded for one subject-to-furlough GS-7 Lead Fire Effects Monitor (GS-7)(Zubia) for 18 pay periods and two GS-5 seasonals for 13 pay periods. However because neither the Southwest Texas or the Permian Fire Groups have a fuels specialist to plan the fuels projects, planning and compliance has fallen largely to the Lead Fire Effects Monitor or the Fire Ecologist or the FMO. The Southern Plains Fire Effect is funded similarly, however they benefit from having a fuels specialist, therefore the Lead can focus on fire effects activities which are significant. However, the crew is relatively new having been established in 2006, however the first led was there only for a year and half and the second lead is finishing up their second year. Thus the position was vacant for a year between leads. The second lead was brought on as a GS-6 and was not fully functionally as a GS-7. Because of the vacancy and the in experience of the new Lead the fire ecologist was carrying out many of

the responsibilities of the Southern Plains Fire Group lead over the past 2 and half years. Up until July of this year the Fire Ecologist managed both Lead Fire Effects Monitors. The Southwest Texas Lead Fire Effects Monitor Zubia has formerly transitioned from lead fire effects to primarily fuels treatment planning, logistics and implementation beginning in March 2010 and supervised by the FMO with the fire effects operations in the Southwest Texas and Permian Fire Group has been taken up by the Fire Ecologist, who is supervising the field crew. Because of some personnel issues that have arisen with the Lead Fire Effects monitor the Southern Fire Group FMO and the Fire Ecologist agree that the program would benefit from on-site day to day supervision of the lead Fire Effects Monitor and Crew. The Fire Ecologist would assist in the strategic management of the program. This occurred at the end of July 2010.

Table 1. Fire Effects Plot Workload (2010) and Total Plots Installed

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn 2010	Immed. Post 2010	Postburn (1-20 yrs) 2010	Total Plots
Big Bend NP	pinyon-juniper-oak	Long-term monitoring*	2			2
	desert grassland	Long-term monitoring*	2			2
	desert shrub	Long-term monitoring*	2			2
	pinyon-juniper-oak	Other			23	23
	pinyon-juniper-oak	Other	48			48
	pinyon-juniper-oak	Other	48			48
	Pinyon-juniper-oak	Other	72			72
Carlsbad Caverns NP	desert grassland	FMH		22	19	41
	desert grassland	Long-term monitoring*			4	4
Fort Davis NHSite	desert grassland	FMH	3			3
	desert grassland	Long-term monitoring*	2			2
Guadalupe Mountains NP	mixed-coniferous forest	FMH			7	7
	desert grassland	FMH			5	5
	mixed coniferous forest	Long-term monitoring*			6	6
	desert grassland	Long-term monitoring*		22	1	1
		TOTALS	179	22	65	266

* Pilot sampling plots

Staffing

For the past two field seasons the Chihuahuan Desert Fire Ecology program has been rereading all the fire effects plots that have been established at BIBE, CAVE, GUMO and FODA over the history of the program (beginning in 1998). In 2009 all of Fire Effects (Fx) plots at BIBE were reread, which amounted to 32 plots, plus the resampling and plot installs that occurred at CAVE, GUMO and FODA. This year most of the field work has been centered at CAVE and GUMO, with the goal of completing the rereads of all the fire effects plots that have been installed in those parks to date. Because the work load this year was primarily at GUMO and CAVE I move the duty station to GUMO in order to avoid excessive travel costs. I advertised for two seasonal positions at GUMO and advised Thomas Faust that it was not necessary to apply as he had indicated that he was coming back for a second year as a seasonal. I made what I thought was a reasonable assumption, that the position was the same and that we were simply changing the duty station. The fact we were using the same position code, using BIBE funding and that GUMO and CAVE were in our fire effects cluster led me to believe that it was not necessary for Thomas to reapply. I was mistaken; it was not the same position and I should have advised him to apply. However, I did not find this out until it was time for Thomas to start work.

Consequently, in order to avoid losing valuable field time and start on schedule I kept BIBE as Thomas's duty station and paid him for travel to GUMO. With the gracious help of Denise Grunder in HR we attempt to re-advertise the position for GUMO a second time to move his duty station there, however we received eight applicants exceeding the number when the position was advertised the first time. With this many applicants there was a possibility of Thomas being bumped. Rather than run the risk of losing a season of training and experience and training, I had sufficient savings in my budget to keep Thomas's duty station at BIBE and pay his travel to CAVE and GUMO. The second seasonal position was to be filled by Wendy Weckesser, however she had been hired by RGI to conduct the plant survey on the Chisos Fire Surrogate Project. Science and Resource Management (ScRM) had stipulated that plant surveys had to be conducted on each plot prior to the thinning treatment which they had agreed to carry it out. However, when it came time to conduct surveys they informed us that they did not have the staffing to do it. Thus in order to proceed, RGI agreed to hire Wendy, who had the botany skills and local experience to conduct the survey. Wendy remained on the plant survey through to its completion primarily because RGI was paying at a higher rate than the fire effects position. Because the plant survey was not completed until mid-June, her start date was pushed back to July. This delay in her start date is where we were able to redirect funding to cover Thomas's travel to GUMO. Because of funding shortfalls as the result of apparent over spending on fuels projects it was determined not to fill the second fire effects seasonal position in a good faith effort to cover cost overruns from within the program. These shortfalls were later covered by moving charges to legitimate accounts. Although the position was offered to Wendy before it was determined not to fill it, she took a position with the Chihuahuan Desert Inventory and Monitoring (CHDN) program. She had applied for the position and had indicated that she was inclined to accept if offered the job.

In addition to Thomas Faust, a Student Conservation Associate (SCA) Resource Associate, Catherin Tennel was hired for 12 weeks, beginning on June 6th to September 3rd. The CHDN also provided funding for a field crew to assist with collecting the field data from Fx plots and to collect data to assess incorporating the Long-term (LT) monitoring protocols into existing system

of Fx plots at BIBE, CAVE and GUMO. We were able to obtain a field crew of four individual including a crew leader through the Southwest Conservation Corps.

Table 2. Fire Ecology Staffing 2010

This includes four fire effects funded individuals (3 NPS and 1 SCA) and four (SCC) I&M funded individuals.

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Richard Gatewood	1.1.10	12.31.10	26	No	
John Zubia	3.1.10	11.19.10	19	No	
Thomas Faust	7.6.10	12.10.10	11	No	
Catherine Tennel (SCA)	6.6.10	9.3.10	7	No	
Landis Ehler (SCC)	9.3.10	11.5.10	5	No	
Kirsten Hakala (SCC)	9.3.10	10.1.10	2	No	
Sebastian Kimlinger (SCC)	9.3.10	11.5.10	5	No	
Christine Weldon (SCC)	9.3.10	11.5.10	5	No	

SCA = Student Conservation Association; SCC=Southwest Conservation Corps

Table 3. Management Objectives and Monitoring Results

Over the last two years we have reread all of the FMH (Forest/Brush) plots that have been installed at BIBE, CAVE & GUMO since 1998. Once data entry is complete for this year we will begin to assess the data originally collected (the first two or three reads) in light of the most recent data, in which there is significantly greater confidence. However, based on a cursory assessment of the data sheets, several issues come immediately to light that may raise questions about to the quality of the data initially and subsequently collected. This in turn may raise questions about the inferences that could be made from any data analysis. This includes but is not limited to the following:

- Incomplete plot documentation made it difficult to determine if the plot was being constantly measured in the same way from previous measurement efforts; particularly in regard to plot layout.
- Confusion with plot location and plot id.
- Questions regarding what constitutes an individual plant?
- Significant species identification issues

These three factors raise questions as to what are the causes of any significant difference(s). We have greater confident in the most recently collected data and will, or will have, addressed the four issues listed above in the monitoring effort over the last two years. We will be discussing this spring with resource management the quandary that issues cause with the initial plot reads.

B. Fire ecologist accomplishments and areas of focus

With the arrival of a new FMO at BIBE, thus new supervision, I have been tasked with more duties related to the Fire Management Program and operations at Big Bend. I have worked with resource management on NEPA compliance with the FMP, the Chisos Fire Surrogate Project, the Rio Grande Restoration project and planning for treatments on the Rio Grande Wild and Scenic River. I have also initiated planning on what is called the Chisos Wildland Fire Use project to allow for the management of natural starts in the Chisos. In addition to this project I also been developing the River Corridor Prescribe Fire Project that extends for most of the Rio Grande starting at Santa Elena Canyon to Boquillas Canyon, some 60 miles of river where we are planning to treat giant cane and salt cedar in the active flood plain.

The most notable and significant accomplishment for the fire program this year and perhaps the history of the program is that prescribed fire was carried out on 21 separate 1 acre units distributed throughout the Chisos Mountains and completed safely and without incident over a two week period in October. All of these were first entry burns associated with the Chisos Fire Surrogate Research Project. The accomplishment of these burns greatly elevated the confidence resource management has in the fire program in managing fire in the park, and most notably the Chisos. The net result is that resource management has, over the last several months, begun coming to fire to identify significant fuels accumulations needing treatment in the Chisos that previously they were reticent to do. The prescribe burns are treatments.

Table 4. Fire Ecologist Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	25	• FMP : Updated NEPA compliance • Chisos Wildland Fire Use (BIBE) : Project description draft identified treatment units • River Corridor Restoration (BIBE) : Draft Plan & identified treatment units • Chisos Fire Surrogate Project Rx treatment (BIBE): Drafted Plan and reviewed component submission component • Chisos Fire Surrogate Project Thinning component (BIBE) : Develop plan and prescription for thinning treatment • Five Lakes & Point Rx (CHIC) Reviewed Burn • Field work planning for SPFG and SWTX Fire Groups
Presentations	<5	BIBE Science and Resource Management
NPS Meetings/ task groups	<5	• Park ○ Resource Management Staff ○ Chief of Visitor and Resource Protection ○ Park Superintendents • Intermountain Region ○ Wildland Fire Specialist
Interagency work	10	• FPA.
Wildfire assignments	5	• The Castolon Farms Wildland Fire Use • Numerous IA fires in North Brewster County TX
Prescribed fire projects	5	Chisos Fire Surrogate Rx
Non-fire fuels projects	5	• Estimated amount of time spent assisting with non-fire fuels projects; include READ activities
Research	10	• Chisos Fire Surrogate Project
Data collection	0	
Data entry	<5	• Entered data collected from the thinning treatments of the Chisos Fire surrogate Project.
Data analysis	<5	Went through a con.
Supervision/Admin	10	Hiring, supervision, payroll, travel authorization/vouchers, purchasing, etc.
Training	<5	• Fire Refresher • PT • Instructor for fire effects seasonals.
Miscellaneous	10	Project Administration • Drafting and modifying Task Agreements (SCA, RGI, SCC) Acting FMO • Cooperative Agreement Administration (RGI, SCA, SCC)

C. Fire effects crew accomplishments and areas of focus

Fire Ecology Field Work

Fire Ecology (Fx) Field work began on June 7th with the arrival of SCA resource assistant Catherine Tennel who was assigned to assist RGI with the completion of the plant survey with

Wendy Weckesser (RGI) and then the installation and measurement of soil erosion pins with Jonathan Dunbar (RGI). Additionally she collected and processed live fuel moisture samples. On July 6th Thomas Faust arrived at BIBE and both he and Catherine spent the following week at BIBE determining if the Yale plots in the Southeast Rim Prescribed Burn could be relocated with the old (2003) GPS points to be resampled later in the summer. This occurred at the end of August by Darren Wallace (RGI) and Catherine. On July 20th Thomas Faust and Catherine Tennel began field work at GUMO on four of the five D-Boundary Plots and then they worked at CAVE where they continue until mid-August. Catherine returned to BIBE on August 18th to assist Darren Wallace (RGI) with completing the field sampling of the Fire Surrogate and the 23 Yale plots. Catherine completed her field season on September 3rd. Thomas continued on at GUMO with the arrival of the Sonoran Desert Inventory and Monitoring (SODN) crew. From August 18th to the 23rd Thomas and the SODN crew worked on the protocols at GUMO with the installation of four forest plots in the bowl and two brush plots at GUMO. Following the departure of the SODN crew, Thomas worked on the identification of the unknown plant species he and Catherine had encountered at CAVE and GUMO. On September 1st the Southwest Conservation Alliance (SWCA) Crew of four individuals arrived at GUMO to spend 10 weeks working with Thomas in completing the fire effects field work and continue the work Thomas had initiated with the SODN Crew. By October 15th they will have completed the field work at CAVE and GUMO and by November 5th, installed 3 Fx and 2 LT plots at FODA and 6 LT Plots at BIBE ending the 2010 field season.

Big Bend National Park (BIBE)

The plot work that has occurred at BIBE this field season was focused primarily on the Fire Surrogate Research Project (to be discussed further under research). This project is being undertaken to develop management alternatives for forest restoration and maintenance involving prescribed fire and thinning, with applications to wildland fire use. All of the fire effects plots at BIBE were reread last year. No plots were installed in the Sublett Fire, however if any are to be installed it will be in the summer of 2011. There are currently two plots near the burned area (west of the burn) that were installed for restoration of Sublett Farm. We will reread those plots with the treatment of the Castolon Farms project in the FY2011. Although burning occurred along the Rio Grande below the entrance of Boquillas Canyon this past season, monitoring is generally carried out by ScRM using their protocols. We have assisted with the data collection when requested, but, to date, this had not happened. The NPS Fx crew had planned to reread the 23 Yale plots that occur on the 2007 Southeast Rim Burn, however it became a joint effort with one individual from the NPS crew and the one from RGI in mid- to late August with the data analyzed as part of the post treatment fire surrogate analysis (Poulos 2010). This was in lieu of collecting data from the fire surrogate plots that will be burned this fall. Data from the burned surrogate plots will not be collected until the summer of 2011.

Carlsbad Cavern National Park (CAVE)

All fire effects plots, with the exception of three that could not be located and nine that were read in 2009 were reread at CAVE this year bringing all the plots at CAVE up to date. A number of plots occurred within the perimeter of the New Fire which burned at the end of May 2010. The number of plots within the burn fire will be determined when the GPS data is obtained from the field crew and analysis to be made when data entry is complete. No new installs occurred this field season. A some of that data was entered while one of the crew members recovered from an

infected agave puncture wound that occurred while conducting field work in The Bowl. Tyler Engle, an Fx seasonal hire at for the Southern Plains Fire Group, was extended an additional two pay periods to assist with data entry and field work completion.

Guadalupe Mountains National Park (GUMO)

At GUMO, all of the Fx plots with the exception of the seven plots reread in 2009 have been reread. This includes all the Forest Plots and the five brush plots located near the park SE boundary. In addition to the Fx Plots, GUMO was the starting point for the pilot sampling for the LT protocols. Here two brush plots and six forest plots incorporated the SODN protocols.

CHDN Long-Term Monitoring Pilot Sampling

A goal of the Fire Ecology program in the National Parks Service is to collaborate in monitoring when there are opportunities to do so, with the primary objective to avoid duplication of effort and to gain efficiency. Collaborating with the Chihuahuan Desert Inventory and Monitoring (CHDN) program provided an opportunity to do this. This year we wanted to assess the incorporation of Sonoran Desert Inventory and Monitoring (SODN) protocols with those used on the fire effects plots and how well protocols perform relative to each other. So this year we have integrated the protocols into some selected Fx plots at four parks. At GUMO six forest plots and two brush plots were sampled, at CAVE four brush plots, at FODA two brush plots and at BIBE two forest plots and four brush plots providing 18 plots for the pilot sampling assessment. The data will be analyzed this spring following data entry by Chihuahuan Desert I & M.

Table 5. Fire Effects Crew Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	70	
WUI plots	0	
CBI plots	0	
Other plot work	10	• Exotic plants plots , • Installed erosion pins for thinning and burning treatments, • surveyed for sensitive plants in reseach burn pots
Wildfire assignments	0	
Prescribed fire projects	0	
Non-fire fuels projects	5	Installed I&M Long term monitoring plots that were not associated with Rx treatments.
Data entry	0	Data entry for the field season was not completed.
Data analysis	0	This is expected to be very low number or zero for fire effects crew/lead monitor
Supervision/Admin	<5	Payroll, travel authorization/voucher, etc.
Training	0	List all training courses attended including in-park, NPS/interagency, and non-government
Miscellaneous	15	• Tracked Rx project costs and submitted funding requests • Assisted with miscellaneous fire and fuels program . • Assisted with fire and fuels project logistics • Assisted with developing Rio restoration burn plans

D. Additional Information

****Note that the entire Annual Report Supplement (Excel spreadsheet) will not need to be completed this year. We will only request a completed supplement as part of the annual report every other year, as many of the requested pieces of information do not change on an annual basis.**

Please complete the new table below which contains the information from the supplement that we feel is valuable to compile on an annual basis to help assess the fire ecology program workload. Everglades National Park is used as a fictitious example in the table.

Table 6. Data Entry and Projects Monitored

Park	% 2010 Data Entered	% 2010 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Big Bend National Park	0	0	22	1	0	0
Carlsbad Caverns National Park	20	5	4	0	1	0
Guadalupe Mountains National Park	10	0	2	0	0	0

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

E. Optional Information

On the following pages are 2 graphs from a final report that analyzed data from experimental thinning plots and prescribed fire that have occurred over the last four years. The results of this analysis included the treatments effects which were incorporated further in forest growth modeling under management scenarios of no treatment, thinning, burning and a combination of thinning and burning occurring at frequency of once or every 35 years. The modeling was for a period of 100 years. These additional results can be found in the final report entitled: Fuels Reduction and Forest Restoration Using Fire and Fire Surrogates in Big Bend National Park: Final Report to the National Park Service, Poulos, September 2010 on file at Big Bend National Park.

Figure 2: Treatment effects on A) tree density, B) tree basal area, and C) seedling density in the Chisos Mountains. Values are plotted as means $\pm$ SE.

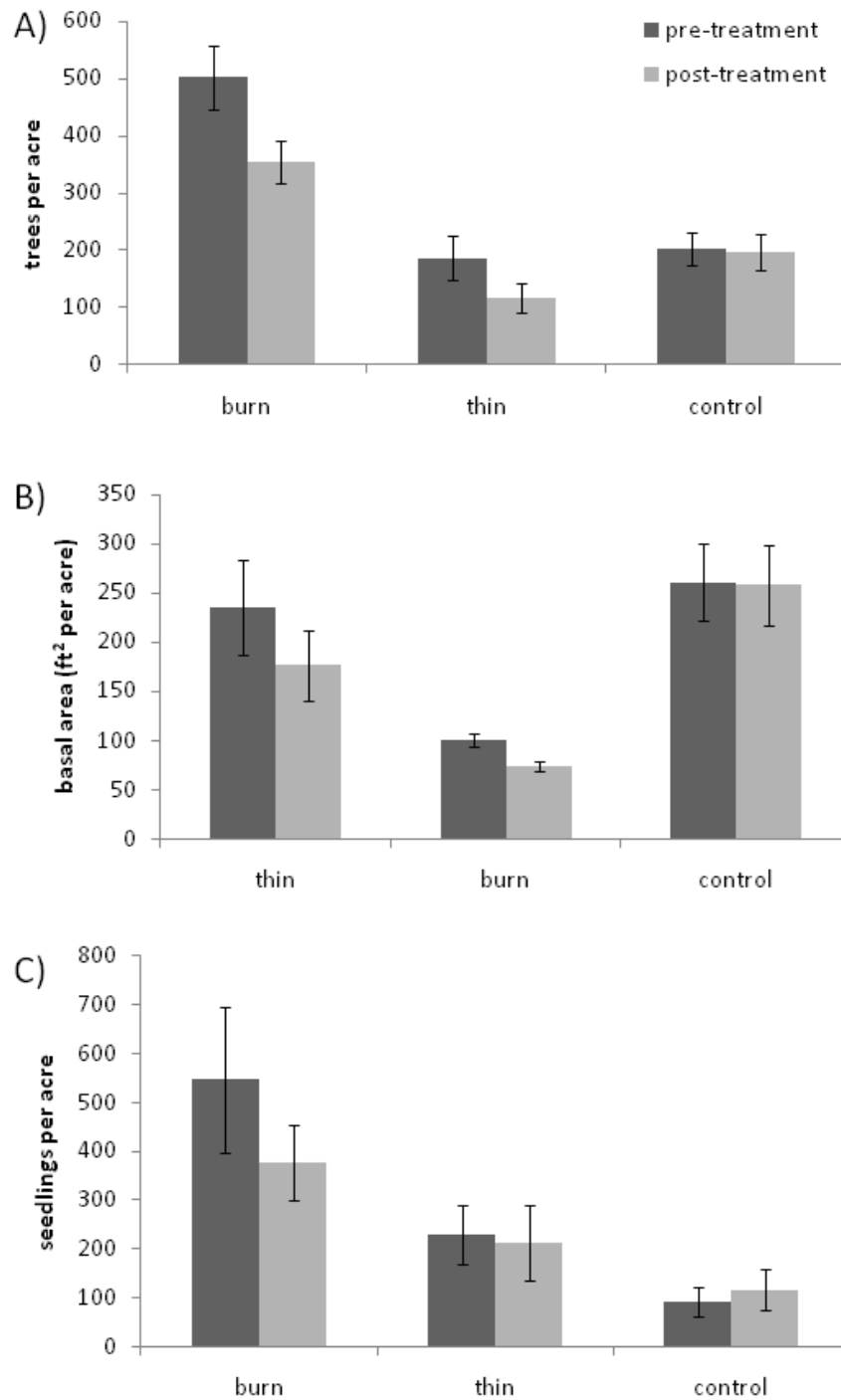


Figure 3: Diameter distributions of pre- and post-treatment plots in thin, burn, and control management alternatives. Values are plotted as means + SE.

