

**National Park Service
Ozark Highlands Fire Ecology Cluster
Fire Ecology Annual Report
Calendar Year 2004**

Introduction

Ozark Highlands Fire Ecology Cluster provides fire effects monitoring support to four different national park units including Ozark National Scenic Riverways in Missouri, Buffalo National River in Arkansas, Pea Ridge National Military Park in Arkansas, and George Washington Carver National Monument in Missouri. OZAR, BUFF, and PERI currently have active monitoring programs with established National Park Service (NPS) Fire Monitoring Handbook (FMH) plots. Please see Tables 1 and 3 for detailed information regarding plots monitored and management objectives. Please see Table 2 for a staffing summary.

Summary

2004 proved to be a challenging year for the Ozarks Highlands Fire Ecology Cluster having suffered a 100% turnover in staff including the lead monitor and fire ecologist in 2003. Adam Luraas, previously the assistant foreman for the Buffalo Fire Use Module, was hired as the lead monitor in October 2003 and carried the program into 2004. In January, the program was immediately moved into one office in a brand new fire cache along with rest of the OZAR Fire staff and equipment. A fuel moisture sampling program was also immediately started and will be implemented once again for the 2005 prescribed fires at Ozark National Scenic Riverways. During the 2004 burn season in the Ozarks, all of the fires at Ozark National Scenic Riverways were monitored for at least fire weather, fire behavior, and smoke production. In addition to the prescribed fires at OZAR, the three-day 11,284 acre, hand ignited Lower Wilderness Prescribed Fire was successfully monitored and completed in mid-March. After a season of monitoring prescribed fires for the Ozark Highlands, Michele Disney, previously a fire effects monitor from Sequoia-Kings Canyon National Park, was hired as the assistant lead monitor in April along with 3 other seasonal monitors to begin field work in May. During the summer amid the field season, the Fire Ecology Assessment Tool (FEAT) database was initially installed and Adam attended the NPS FEAT/Statistics Workshop in Fort Collins, Colorado for further instruction in this challenging process. New fire effects plots were also established at Buffalo National River outside of the Lower Wilderness burn in three separate burn units. All plots were successfully completed and monitored by late September. Besides a few tick bites, chigger bites, and briar gouges, no one was injured nor had an accident. Earlier in the season the entire staff became red carded, but due to a slow

Summary (continued)

fire season no one gained any new fire experience. In August, Dan Swanson, previously the lead fire effects monitor for Guadalupe National Park, was hired as the Ozark Highlands Fire Ecologist after being vacant for 11 months. In addition to providing fresh and experienced direction to the Ozark Highlands Fire Ecology program, Dan is a leader for testing and implementing the data conversion process from the FMH database to FEAT. Dan and Adam were fortunate to travel to Glacier National Park in order to learn and experience “hands-on” Composite Burn Index (CBI) monitoring as well as West Virginia to receive a “train-the-trainers” certificate for Fire Regime Condition Class (FRCC) monitoring and reporting. Dan has also implemented CBI monitoring in the Ozarks at the Lower Wilderness burn and is planning to implement FRCC monitoring throughout the 2005 prescribed fire season.

Unfortunately, due to the vacant fire ecologist position and implementing FEAT, 2004 fire effects monitoring results are unavailable at this time. As of January 19, 2005 we are currently entering 2004 fire effects plot data into the new FEAT database by hand and expect to be finished relatively soon. However, we are excited to eventually examine the results of units that have been burned at least twice at OZAR and to see how one large-landscape prescribed fire affected woody stem density and plant diversity in the Lower Wilderness at BUFF.

Table 1. Ozark Highlands Fire Effects Plot Workload 2004

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Plot Locations	Pre-Burn	Immed. Post	Post-burn (1-20 yrs.)	Total Plots*
Ozark National Scenic Riverways	Glade/Transition	Modified FMH forest plot	18	0	7	15	22
	Dry-Mesic Woodland (Oak/Hickory/Pine)	FMH forest plot	10	0	2	9	11
	Dry Woodland (Oak/Hickory/Pine)	FMH forest plot	12	0	7	11	18
	Various	Fuels	13	5	5	0	0
Buffalo National River	Glade/Savannah/Woodland	Modified FMH forest plot	10	2	8	8	18
	Mixed Oak Forest/Dry Woodland	FMH forest plot	10	3	7	7	17
	Open Fields/Cane Communities	FMH grass plot	2	0	2	0	2
	Mixed Oak Forest/Dry Woodland	Fuels	4	4	0	0	4
	Mixed Oak Forest/Dry Woodland	CBI	na	0	14	0	14
Pea Ridge National Military Park	E. red cedar/Mixed Hardwood/Old Fields/Disturbed Sites	None established to date	0	na	na	na	0
	Oak Hickory Forest/Woodland	FMH forest plot	3	0	0	3	3
	Post oak-blackjack oak savannah/woodland	FMH forest plot	3	0	1	3	4
	Restored Prairies/Fields/Glades	FMH grass plot	2	0	2	2	4
George Washington Carver National Monument	NONE established to date	NONE established to date	na	na	na	na	na
TOTAL			87*	14	55	58	117

*Total Plots indicate plot visits and TOTAL Plot Locations indicates number of permanent plots

Table 2. Ozark Highlands Fire Ecology Staffing 2004

Personnel	Starting Date	Ending Date	# of Pay Periods	Training and Development
Dan Swanson, Fire Ecologist	8/8/04	Permanent, full time	26	FRCC, CBI
Adam Luraas, Lead Monitor	1/11/04	Permanent, STF (11/27/04)	23	FRCC, CBI, ArcGIS, various leadership, Botany
Michele Disney, Assistant Lead Monitor	1/11/04 4/18/04	4/17/04 10/16/04	20, two separate seasons	Fire Information, S-244, Botany
John Richter, Monitor	4/18/04	10/2/04	13	Basic Fire School, Botany
Tom Saladyga, Monitor	4/18/04	9/4/04	11	Basic Fire School, Botany
Cliff Martin, Monitor	4/18/04	7/10/04	7	Basic Fire School, Botany



Figure 1. 2004 Ozark Highlands Fire Effects Crew



Figure 2. Typical backing fire behavior in Ozarks



Figure 3. OZAR fire personnel igniting field next to Current River



Figure 4. Fire effects monitoring in Ozarks glade

Table 3. Ozark Highlands Management Objectives and Monitoring Results 2004

Park	Monitoring Unit	Management Objective	Monitoring Results	Objective Achieved
Ozark National Scenic Riverways	Glade/Transition	Reduce the density of trees > 1.4 m tall and < than 10 cm dbh by at least 40% ; and increase the average number of species (per quadrat) in the herbaceous layer by at least 40% within two growing seasons after the second burn	Not Analyzed (NA)	Not Available (NA)
	Dry-Mesic Woodland (Oak/Hickory/Pine)	Reduce the density of trees > 1.4 m tall and < than 10 cm dbh by at least 30% ; and increase the average number of species (per quadrat) in the herbaceous layer by at least 20% within two growing seasons after the second burn	NA	NA
	Dry Woodland (Oak/Hickory/Pine)	Reduce the density of trees > 1.4 m tall and < than 10 cm dbh by at least 30%; and increase the average number of species (per quadrat) in the herbaceous layer by at least 40% within two growing seasons after the second burn	NA	NA
Buffalo National River	Glade/Savannah/Woodland	Herbaceous layer – increase cover of native species by 40% after 10 years of burning, reduce stem density by 60% after 10 years of burning, and reduce new growth eastern red cedar by 95% after three consecutive burns	NA	NA
	Mixed Oak Forest/Woodland	Reduce tree density to open vista with a target density of 30-50 trees/acre after 20 years, reduce stem density by 60% after 10 years of burning , and reduce live stems/acre by 60 % over 10 years of burning	NA	NA
	Open Fields/Cane Communities	Open fields - Maintain/restore/introduce native grass species and increase percent cover of native species by 25% after three prescribed burn applications Cultural/historic - Maintain historical farmstead openings, establish monitoring photopoints, maintain woody species density at 90% of preburn level within open fields over 10 years of burning Cane communities - maintain edge effect of cane community within 100% or more of preburn cover, and encourage nesting for neotropical migrants (Swainsons)	NA	NA
Pea Ridge National Military Park	E. Red Cedar/Mixed Hardwood/Old Fields/Disturbed Sites	Reduce mean density of pole-sized trees (2.5-15cm dbh) by 30-40% after four burns, increase mean density of oak seedlings and/or resprouts by 300-500% after four burns, and increase mean percent cover of native herbaceous species by 50-70% after four burns.	NA	NA
	Oak Hickory Forest/Woodland	Reduce mean density of pole-sized trees (2.5-15cm dbh) by 50-70% after four burns and increase mean density of oak seedlings and/or resprouts by 300-500% after four burns.	NA	NA
	Post oak-blackjack oak savannah/woodland	Reduce mean density of pole-sized trees (2.5-15cm dbh) by 50-70% after four burns and increase mean percent cover of native herbaceous species by 60-100% after four burns	NA	NA
	Restored Prairies/Fields/Glades	Reduce mean percent cover of live trees, shrubs, and woody vines by 75-85% after four burns and reduce the mean percent cover of non-native species by 30-40% after four burns	NA	NA

Ozark Highlands Fire Ecologist Accomplishments

I have been participating in the FEAT conversion working group since my arrival at Ozark National Scenic Riverways in mid August. I've been working primarily with OZAR's FMH data and been dealing with the problems/issues that have arisen with each FEAT conversion program. I've provided feedback to the FEAT technical working group on these matters. Analysis of the fire effects data will begin after the completion of the data entry from the 2004 field season. This is a high priority of mine since I will be able to see if our monitoring objectives are being met with current prescribed burn procedures.

The lead fire effects monitor and I installed 14 CBI plots in the Lower Wilderness burn unit at BUFF. Analysis of the burn severity data from the field provided a weak correlation to the burn severity landsat imagery data. This was probably due to the timing of our field assessment which was in late October and leaf off had already begun. In the future CBI plots will be read during the growing season within one year of the burn to ensure the most accurate assessments can be made. I plan on implementing (2005) CBI into burn units where there are currently no FMH plots so that we can look at the effects of fire behavior on burn severity on a large scale basis.

Fire regime and condition class (FRCC) will also be implemented for the 2005 field season into each burn unit so we can compare historic vegetation/structure and fire frequency/severity to current levels and see what our departure is. We will assess these sites after the completion of prescribed burns to see if we indeed are returning vegetation communities back to reference conditions.

2005 Outlook and Program Challenges/Solutions

The most exciting outlook for 2005 is the application and implementation of the Fire Ecology Assessment Tool (FEAT) database. Despite the increased workload and decreased budget faced everywhere in the federal agencies, the onset of collecting digital data without hand-entry, especially with practice, familiarity, and adaptation, will eventually bring efficiency and more access to our data. The biggest challenge between now and then for the Ozark Highlands programs seems to be ensuring our data is cleanly converted and moved entirely into FEAT. We are taking each step in stride and trying to pay attention to the smallest of errors. Of course, this leaves less time for analyzing our data. The Ozark Highlands Fire Ecology program is also incorporating CBI and FRCC monitoring into our regular monitoring schedule which will eventually lead to more information about Ozarks fire ecology. But as most programs are experiencing, it is becoming increasingly difficult to use the massive amount of data and communicate meaningful results to managers. This is also related to preparing meaningful prescribed fire monitoring results that reflect individual prescribed fire monitoring results, such as one-time fuel consumption rates, as well as reviewing overall monitoring unit objectives. We are trying to face these challenges by trying to prevent rapid personnel turnover, getting help from non-monitoring personnel when available, and simply being creative with time management and scheduling. Regional collaboration with information sharing and national workshops has been especially helpful. The Ozarks crew is also planning on participating in the 2005 Missouri Natural Resources Conference in February where a large group of professionals, land management agencies, and groups from across the state are meeting to discuss and present information.