



**National Park Service
Fire Ecology Annual Report
Calendar Year 2007**

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Summary

Fire ecology staff for 2007 consisted of James Leckie, Lead Fire Effects Monitor, and Perry Grissom.

It was another slow fire season, and for the second straight year only two wildfires burned about 8 acres on Saguaro NP. The area has been in a drought for over 6 years, and it was dry early in the year. There was the potential for a very active fire season, but when the monsoon came, it was wet, but without the flooding of 2006. Due to drought early in the season, and green, wet conditions later, the Saddle prescribed burn was postponed to 2008. With two wet summers, the lower elevations of the burn unit now have a major grass crop, where there had been little previously.

The Record of Decision for SAGU's Fire Management Plan was published Friday, July 13, 2007, allowing Wildland Fire Use again. The two wildfires of the year started prior to this (July 6 and 11) and were suppressed. Invasive plants took up an increasing amount of time.

Plot Work

Leckie and Grissom went up the mountain for two trips, in May and June. The May trip was mainly designed to visit plots in the Saddle burn unit to answer questions about previously collected data before the plots were burned.

One more full rapid assessment plot was installed in the Saddle burn unit, and several plots of variable radius for determining plot size were sampled. Photopoints were established for monitoring agave (the flowers of which are food sources for the Endangered nectar-feeding bat, the Lesser long-nosed bat (Leptonycteris curasoae yerbabuenae)).

Staffing was sufficient to perform five-year reads on 5 ponderosa pine plots. Assistance was provided for one day each by Mike Ward, Bethany Hontz, Kristina Andruk, Kris Ratzlaff (SAGU, Resources) and Jeff Balmat (I&M). Not performed were 5-year reads on 13 ponderosa pine plots.

In order to analyze data and provide a report to Walnut Canyon NP staff, in September Leckie and Grissom spent a week there. They rechecked tagged trees and poles to fix data problems and maintained plot and tree markings on all the plots (10 ponderosa pine plots and 2 pinyon pine plots). Paul Whitefield, WACA, provided two field assistants for one day each.

The 2008 workload will depend on which prescribed burn unit is burned. There are 13 10-year reads due from the Chimenea burn: 10 Madrean evergreen woodland (Arizona oak) plots and three ponderosa pine plots. If the Saddle unit is burned, the workload would include six post-burn Chihuahua pine plots and 10 post-burn Arizona oak plots. There would also be three post-burn rapid assessment plots to be read. If the North Slope burn unit is burned (it also involves USFS land, and it is on their funding cycle for this year), no pre-burn FMH plots exist. There are two rapid assessment plots within that burn unit, and more would be installed.

Burns are planned for Coronado National Memorial, and agave monitoring is needed. A protocol for agave monitoring is being developed.

Table 1. Fire Effects Plot Workload, 2007

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
Saguaro National Park 70 plots	Ponderosa Pine Forest	28 FMH Forest Plots			5	5
	Madrean Evergreen Woodland- Encinal Woodland (Arizona oak)	10 FMH Forest Plots				
	Madrean Evergreen Woodland- Encinal Woodland (mixed oak-PJ)	2 Rapid Assessment Pilot Plots				
	Pine-Oak Forest (Arizona oak)	12 FMH Forest Plots				
	Douglas Fir-Mixed Conifer Forest	10 FMH Forest Plots				
	Silverleaf oak	3 FMH Forest Plots				
	Pine Oak Forest (Chihuahuan pine)	7 FMH Forest Plots				
	Pine Oak Forest	1 Rapid Assessment Plot	1			1

	(Chihuahuan pine)					
Sunset Crater N.M. 15 Plots	Montane Meadow	10 FMH Grassland Plots				
	Pine Encroachment Area of Montane Meadow	5 FMH Brush Plots				
Wupatki N.M. 16 Plots	Plains/Great Basin Grassland-short grass community	16 FMH Grassland Plots				
Walnut Canyon N.M. 12 Plots	Ponderosa pine Forest	11 FMH Forest Plots			10	10*
	Pinyon-Juniper Forest	2 FMH Forest Plots			2	2*
Total	10 monitoring types	82 Forest, 5 Brush, 26 Grassland Plots, 6 Rapid Assessment Plots	1		17	18
* Visited plots, checked tagged trees and poles, not full read						

Table 3. Fire Ecology Staffing, 2007

	Starting Date	Ending Date	# of Pay Periods	Training and Development
Perry Grissom Fire Ecologist	10/1/06	9/30/07	26	Fireline refresher, NPS Fundamentals 2-4, S490, herbicide applicator certification, USGS online Short Course on Designing Natural Resource Monitoring Surveys
James Leckie Lead Monitor	3/5/07	9/27/07	15	Fireline refresher, herbicide applicator certification, USGS online Short Course on Designing Natural Resource Monitoring Surveys

Management Objectives and Monitoring Results, 2007

No prescribed burns were accomplished in 2007, and no Wildland Fire Use occurred. Analyses on the few plots sampled from previous burns were not conducted. A contract to clean up FMH data was entered into with the University of Arizona Center for Applied Spatial Analysis through the Desert Southwest Cooperative Ecosystem Studies Unit. About half the data had been gone through by the end of the year.

Staff of Walnut Canyon NM requested a summary of their plot data, a visit was performed in October, and analysis is under way.

Table 4. Fire Ecologist Accomplishments/Focus Area

Category	Percent Time	Accomplishments/Focus Areas
Planning	12%	Huachuca Area Fire Partners FireScape Planning, mid-level NEPA, (includes CORO), consultation with FWS; Catalina-Rincon FireScape (SAGU) starting; SAGU FMP
Presentations	1%	invasive plant ID presentation at Visitor Center; Fire Ecologist panel discussion for UA Fire Ecology class; buffelgrass fire safety advisory presented at 2 interagency fire refreshers
NPS meetings/ task groups	<1%	FEAT online workshops; Fire Staff and Resource Staff Division meetings
Interagency work	10%	Fuels, non-native invasive plants; Coronado NF, USGS, Rural Metro FD
Fire Assignments & Fuels Projects	20%	Fuels: RXB2 pile burning TUMA; scout potential projects on CORO; Wildfire: two small wildfires on SAGU, one adjacent to CORO; review NPS and USFS burn plans; spray buffelgrass; live fuel moisture monitoring; salt cedar control
Research	5%	Wrote proposal for fire-buffelgrass research project, which was funded, working with University of Arizona on fuel loading/fire behavior study
Data collection	10%	FMH and rapid assessment plots SAGU and WACA; grazing study; work on rapid assessment protocols; walk old burns; invasives inventory Molino Basin (USFS) and mapping (SAGU)
Data entry	2%	Data entry and cleanup (funded for data cleanup through Univ. Arizona)
Data conversion	1%	FEAT conversion
Data analysis	2%	Examining data, plant ID, GIS
Supervision/Admin	2%	Hiring, supervision, travel, payroll, develop performance plan, etc.
Training	15%	NPS Fundamentals 2-4, S490, OAS B-3, supervisory training, herbicide applicator certification, USGS online Short Course on Designing Natural Resource Monitoring Surveys, pre-retirement seminar, defensive driving, annual fireline refresher
Outreach	12%	press releases for buffelgrass control and volunteer recruitment, wildfires, and fire management plan; TV appearances about buffelgrass and fire ecology; newspaper interviews about buffelgrass control; SAGU Outreach Committee member; job shadow by 6 8 th graders
Miscellaneous	8%	Safety (buffelgrass advisory); Attended national conference of The Wildlife Society (Tucson); attended Southwest Vegetation Management Association Conference (Tucson); reviewed plans and reports; commented on Resources Div. 5-year Plan; periodically served as acting FMO

Table 5. Fire Effects Crew Accomplishments

Category	Percent Time	Notes
Data collection	20%	FMH plots and rapid assessment plots, SAGU and WACA; invasives mapping
Fire Assignments & Fuels Projects	30%	went with Pleasant Valley Hotshots to MT/ID; herbicide buffelgrass (both to cover base shortfall); Saddle Burn Unit prep; fuel moisture monitoring; invasives control
Data entry	25%	mainly data cleanup
Data conversion	5%	prep for converting FMH data to FEAT
Data analysis	5%	Flagstaff area parks
Supervision/Admin	5%	Travel, etc.
Training	5%	Fireline refresher, herbicide applicator certification, USGS online Short Course on Designing Natural Resource Monitoring, defensive

Category	Percent Time	Notes
		driving
Miscellaneous	5%	GIS, FMP

Other:

The biggest issue continues to be non-native plants. Coronado NM has a large infestation of Lehmann lovegrass (Eragrostis lehmaniana), which creates abnormally heavy fuel loads. When burned, it threatens to damage agave, an important food source for the Endangered, nectar-feeding Lesser long-nosed bat (Leptonycteris curasoae yerbabuenae).

The entire reason for the existence of Saguaro NP is in critical danger. Invasive, non-native grasses threaten to fill in the desert, outcompeting native plant species and creating a major fire hazard. Buffelgrass (Pennisetum ciliare, a.k.a. Cenchrus ciliaris) is the main problem. It is estimated to currently infest 2,000 acres on SAGU, up from 300 acres in 2002. This species, which is native to Africa and Asia, is aggressive, produces prodigious biomass, and is well-adapted to fire.

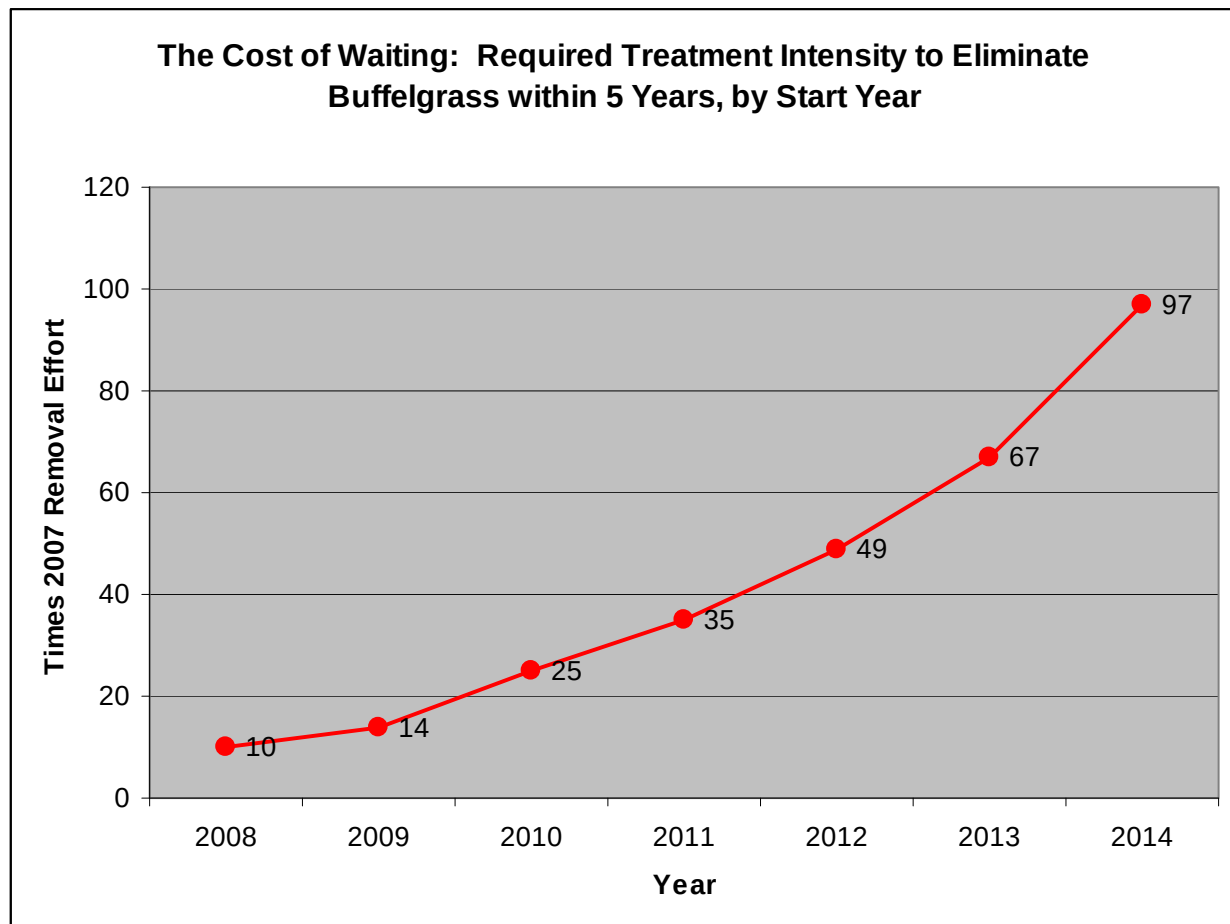
Buffelgrass has the potential to disrupt the area's natural fire regimes. It can invade undisturbed desert, outcompete native desert-dwelling species, and create heavy and continuous fuel loads. It could convert the Sonoran desert to a scrub grassland within 10-15 years, eliminating fire sensitive species such as the saguaro, palo verde, and many other native plant and animal species. Currently the sparsely vegetated desert largely buffers urban areas from wildfires burning at higher elevations, but if buffelgrass fills in the desert, lightning fires will be able to march downhill to the houses, and human-caused fires will run uphill into the Wilderness. Not only is the fire regime in the desert threatened, the top of the mountain may be affected as well, from increased incidence of human fires and inability to securely manage Wildland Fire Use incidents.

Invasive species took up an increased amount of effort in 2007. In addition to their work with outreach, mapping, and control, FE Grissom filled in at areawide Buffelgrass Core Group meetings until the vacant Restoration Ecologist position was filled (welcome back, Dana Backer). He also contributed to the park's webpage and organized several community volunteer buffelgrass pulls during this period. Buffelgrass is creating unprecedented fuel loads in desert areas, so Grissom wrote a safety advisory to warn firefighters about the potential for more extreme fire behavior and an increased threat to safety. One federal firefighter was slightly burned during suppression actions during the year, and the advisory was credited with preventing worse or additional injuries. For more information about buffelgrass, see www.buffelgrass.org.

Salt cedar (Tamarix species) seedlings keep cropping up in Rincon Creek, and efforts to remove them and find and remove the seed source are underway. Other grasses with the potential to increase fires in the desert are (roughly in their order of current abundance) fountaingrass (Pennisetum setaceum), Natal grass (Melinis repens, formerly Rhynchelytrum roseum), tickgrass (Eragrostis echinochloidea), soft-feather pappus grass (Enneapogon cenchroides), and Lehmann lovegrass.

During a May visit to the North Slope burn unit, Leckie and Grissom were surprised to find scattered red brome (Bromus rubens) in the 2003 “Helens 2” burn, at an elevation of over 7,000 feet. Searches for cheatgrass (B. tectorum) where previously found failed to locate any. Red brome formerly was very common in desert areas, but a series of wet winters has greatly reduced its abundance at lower elevations.

Below is a graph illustrating the seriousness of the situation.



For example, if we wait until 2010 to gear up, it will take 25 times the effort expended in 2007. The shape of this curve roughly equals the buffelgrass growth (expansion) curve.