



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

A. Summary

Saguaro National Park had two wildfires in 2010: one human-caused and one lightning-caused. An abandoned campfire at the Mica View picnic area burned 0.1 acre in Sonoran desert scrub. Lightning ignited a fire near Helen's Dome, which grew to 1.7 acres in ponderosa pine and oak before being extinguished by monsoon rains. The park carried out one prescribed fire, the Mica Rx, in late June. Prior to ignition an informal Mexican spotted owl survey was conducted in the Italian Springs PAC. No owls were detected.

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

Fifteen year-one grassland plot reads were conducted at Coronado National Memorial with assistance from Chris Roberts, a botanist on detail from Lake Mead National Recreation Area. Fifteen ponderosa pine pre-burn reads were accomplished at Saguaro National Park with the assistance of Shannon McCloskey, Backcountry Ranger, in anticipation of the Mica Rx. Due to lower than predicted relative humidities, only one of four burn units was ignited. That unit contained four FMH plots, and first order fire effects data was collected by James Leckie (Fire Effects) and Kris Ratzlaff from the Resources Division, a READ-trainee on the burn. Reads from three year-two forest plots in the Chimenea wildfire and two year-one plots in the Telegraph wildfire were also performed. Immediate post-burn assessments were done with the assistance of Kara O'Brien (Resources), McCloskey, and a Sonoran Desert Network Inventory and Monitoring crew.

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
Saguaro National Park	Ponderosa Pine Forest	28 FMH Forest Plots 1 Rapid Assessment Plot	15*	4*	1*	29
	Madrean Evergreen Woodland- Encinal Woodland (Arizona oak)	FMH Forest Plots			4*	10
	Madrean Evergreen Woodland- Encinal Woodland (mixed oak-PJ)	Rapid Assessment Pilot Plots				1
	Pine-Oak Forest (Arizona oak)	FMH Forest Plots				12
	Douglas Fir-Mixed Conifer Forest	10 FMH Forest Plots 2 Rapid Assessment Plots				12
	Silverleaf oak	3 FMH Forest Plots				3
	Pine Oak Forest (Chihuahuan pine)	7 FMH Forest Plots 3 Rapid Assessment Plots				10
Sunset Crater N.M.	Montane Meadow	FMH Grassland Plots				10
	Pine Encroachment Area of Montane Meadow	FMH Brush Plots				5
Wupatki N.M.	Plains/Great Basin Grassland-short grass community	FMH Grassland Plots				16
Walnut Canyon N.M.	Ponderosa pine Forest	FMH Forest Plots				11
	Pinyon-Juniper Forest	FMH Forest Plots				2
Coronado National Memorial	Semi Desert Grassland (disturbed)	15 FMH Grassland Plots			15	15
Total	10 monitoring types	82 Forest, 5 Brush, 41 Grassland Plots, 7 Rapid Assessment Plots	15	4	20	135
* Collected data on trees, poles and some fuels-not full reads						

Table 2. Fire Ecology Staffing 2010

	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Perry Grissom Fire Ecologist	1/1/10	12/31/10	26	Yes	Fireline refresher, CPR refresher, R Statistical Package, Agreements Technical Representative, misc. supervisory trainings, herbicide applicator refresher, RX-510 (Advanced Fire Effects).
James Leckie Lead Monitor	3/28/10	09/24/10 (Plus 2 weeks in Oct. as READ.)	14	Yes	Fireline refresher, CPR refresher, S-211 (Portable Pumps), helicopter longline.

Table 3. Management Objectives and Monitoring Results

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (95% confidence interval)	Objective Achieved?	Year Last Analysis Completed
CORO Semi Desert Grassland (disturbed)	Immediate Post-burn: Remove up to 100% of the Lehmann lovegrass cover	Total Lehmann lovegrass cover reduction = 99.9-100% (n=15 plots, 1 fire)	Yes	2010
	Long-term: Reduce Lehmann lovegrass cover	One year post-burn Lehmann lovegrass cover Pre-burn: 23-94% (ave. = 66.1; s.d. = 21.8) Post-burn 4-58% (ave. = 21.8; s.d. = 15.9) (n=15)	Yes	2010
	Increase native herbaceous cover	Native species average cover Pre-burn = 12.7% (s.d. 7.7) post-burn = 55.3%(s.d. 22.8) (n=15)	Yes	
	Keep agave mortality less than 20%	27%	No	
SAGU Ponderosa Pine	Post-burn Severity: ≤25% Unburned ≤10% Heavily Burned	PLOTS Substrate Vegetation 1% Unburned 4% 32% Scorched 26% 23% Lightly Burned 34% 44% Moderately Burned 14% 0% Heavily Burned 0% UNIT 1.5 acres of unit GPS'd as heavily burned = 1.3% of the unit (0.75 acres of crown removal and 0.75 acres of previously dead & down); unburned estimated <10%	Yes (4 plots and foot survey of the entire unit)	2010
	Year 1: Reduce pine pole-sized trees 15%-70%	To assess in 2011.	TBD	
	Long Term: Reduce >18" dbh trees by no more than 10%	To assess in 2011 and 2012.	TBD	

B. Fire ecologist accomplishments and areas of focus

Table 4. Fire Ecologist Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	11	Wrote CORO FireScope FONSI--signed in April; assisted with effort for contract writing of EA's for TUMA, ORPI, FOBO, CAGR, and MOWE/MOCA/TUZI; TONT CWPP development; worked on Programmatic BAER plan for SAGU; smoke management meeting PHX; WFDSS; SAGU Wilderness plan development.
Presentations	6	FAM workshop in San Antonio--prepared and presented a poster about buffelgrass fire behavior; SAGU science workshop for public--prepared and presented posters on buffelgrass and managing natural fires; led sand table/WFDSS exercise for SAGU; presented fire ecology and/or buffelgrass presentations for M580 field trip, Teacher-Ranger-Teachers, and Youth in Parks group; gave two talks for the public at Visitor Centers about buffelgrass and fire, a total of 33 people attended.
NPS Meetings/ task groups	5	FAM workshop; SAGU and Fire and Resource Divisions meetings; BioBlitz; Rincon Peak Rx.
Interagency work	7	Participated in Southeast Arizona LANDFIRE layer calibration; Buffelgrass working group workshops.
Wildfire assignments	1	Hiked to and declared Helens wildfire out (SAGU)--ICT4.
Prescribed fire projects	9	Mica Rx: planning, PEPC, RXB2; technical review for Buckhorn Rx and SCRD pile burning (USFS); review parts of burn plans for SAGU (Mica, Saddle); TUMA and CORO site visits about wildfire hazard and fuels treatments; set up Rincon Peak Rx in PEPC.
Non-fire fuels projects	15	SCA task agreement writing and administration: SAGU buffelgrass spraying (for FY10) and SAGU/CORO/CHIR/FOBO fuel and weed projects (for FY11).
Research	7	Cooperated in 2 fire-funded research projects about buffelgrass treatments; worked with Resources to develop task agreement for NRPP-funded research into restoration of buffelgrass eradication areas and burned areas; reviewed 2 draft journal publications from fire-funded buffelgrass/fire behavior research; Southwest Fire Consortium workshop--sat on Research Needs panel; helped draft and submitted research proposal about buffelgrass greenup; buffelgrass aerial spray equipment tests.
Data collection	7	FMH plots Mica Rx and 2008-2009 wildfires.
Data entry	4	FMH plots Mica Rx and 2008-2009 wildfires; CORO Lehmann lovegrass.
Data analysis	8	FMH plots SAGU and CORO; buffelgrass demographics and fire season; fire weather/behavior data; SAGU fire history data rectification; SAGU FRID calculation; ORPI fire stats.
Supervision/Admin	4	General supervision; periodically acted as FMO.
Training	6	See table 2.
Outreach	5	Drafted and led revision of buffelgrass talking points document; served on SAGU Community Outreach committee.
Miscellaneous	5	Congressional field hearings about buffelgrass; created ops maps; safety plan; annual FMP report; Combined Federal Campaign coordinator.

C. Fire effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	32	FMH plots at SAGU and CORO.
WUI plots	0	
CBI plots	0	
Other plot work	1	Fire temperature measurements with Tempilaq at Mica Rx.
Wildfire assignments	1	ICT5(t) Helens fire, SAGU.
Prescribed fire projects	15	Mica Rx (FEMO); fuel moisture sampling.
Non-fire fuels projects	0	
Data entry	6	Photo sorting; coordination with U of A on data clean-up project.
Data analysis	1	SAGU and CORO data.
Supervision/Admin	10	Payroll, travel authorization/voucher, train as FEMO/READ and in FMH techniques staff from Resources, I&M, and SCA interns; safety—JHA writing.
Training	5	See table 2.
Miscellaneous	29	Deepwater Horizon (READ); Mexican spotted owl surveys USFS; document/eradicate/voucher populations of a new exotic plant species for SAGU-- <i>Matthiola parviflora</i> ; GIS.

D. Additional Information

Table 6. Data Entry and Projects Monitored

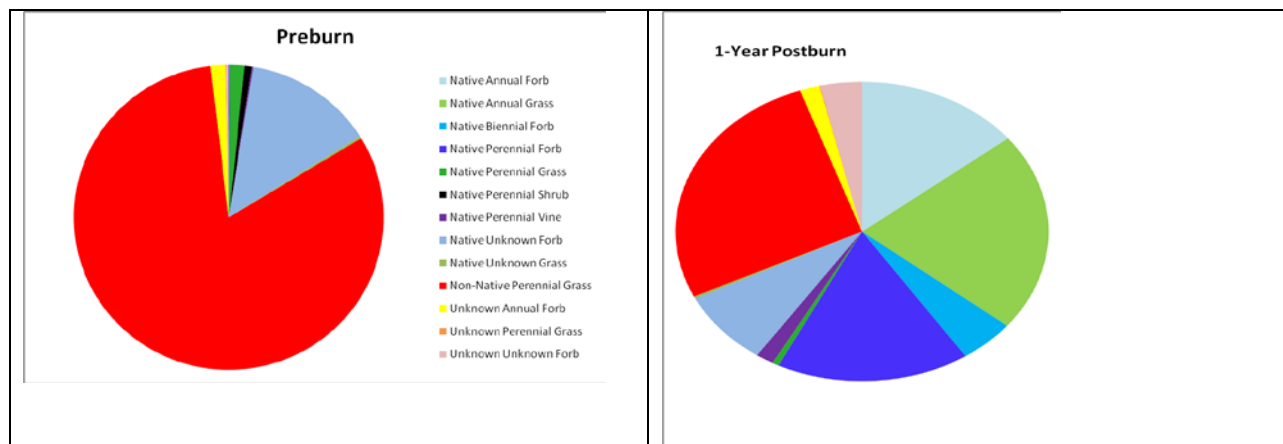
Park	% 2010 Data Entered	% 2010 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Saguaro National Park	100%	100%	1	0	0	0

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

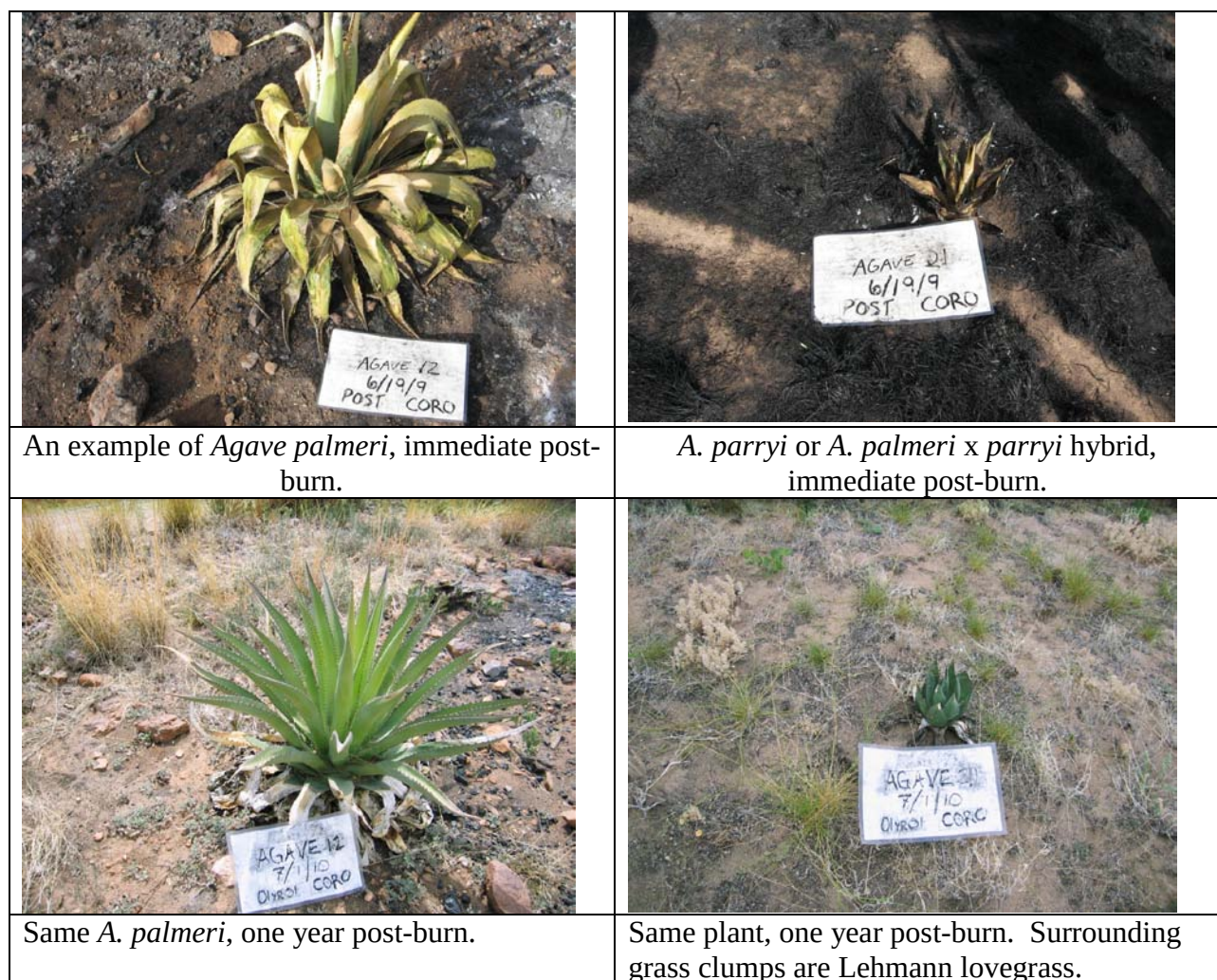
E. Optional Information

Coronado National Memorial

Grassland infested with the non-native perennial grass, Lehmann lovegrass (*Eragrostis lehmanniana*), was treated in 2009. Lehmann lovegrass negatively impacts native plant and animal communities by crowding out native plants and increasing fire severity. Thirty-seven acres containing three five-acre experimental blocks were burned in June 2009, and after greenup the blocks were sprayed with glyphosate using backpack sprayers. One block was also sprayed with the pre-emergent imazapic.



Pie charts showing plant community change one year after burning and herbicide application. The target (in red) decreased from 67% cover to 22% cover. The biggest increase after treatment was among native forbs, especially annuals. Native grasses were rare before the burn and decreased following treatment (from 1.6% to 0.8% cover).



All agave in the burn unit were monitored. Agave are especially important because their flowers provide nectar for lesser long-nosed bats (endangered) and many other wildlife species. Only 29 agave were found in the burn unit, and they suffered 28% mortality. Analysis is continuing, but it appears that most mortality was associated with small agave in heavy Lehmann lovegrass fuels. Clipped plots indicated fuel loads of 2.75-4.19 tons/acre (average 3.46 t/ac), which is considerably more than fire burning in native grassland would encounter.

Saguaro National Park

The Mica prescribed burn in Saguaro National Park was the park's first in-season burn in 14 years and first prescribed burn in six years. On the upper edge of the prescription, it appeared to do excellent job of consuming ground fuels and thinning seedlings and poles within its 114-acre perimeter.



Mica prescribed burn. Sluggish behavior in the morning.



Mica prescribed burn. Less sluggish fire behavior around noon.



Saguaro NP Fire Effects and Resources staff, and staff and SCA interns from SODN Inventory & Monitoring crew walking through the 2010 Mica Prescribed Burn in September, 2010. I&M assisted with monitoring for one day, and information was exchanged about each others' monitoring techniques.



One of the more intensely burned plots from the June 25, 2010, Mica Prescribed Burn. Ponderosa pine.



Year-one post-burn visit to the Telegraph wildfire of 2009. Ponderosa pine.



Year-two visit to the 2009 Chimenea wildfire. Ponderosa pine and silverleaf oak.