



National Park Service Fire Ecology Annual Report Calendar Year 2012

A. Summary

2012 was a productive year for the Northern Great Plains (NGP) fire ecology program. A total of 204 plots of various types were measured, which included 54 installs in five park units. Four prescribed fires occurred in the NGP parks, resulting in 15 plots being burned, 7 of which were measured immediately post-burn. Severe to exceptional drought enveloped all of the Northern Great Plains parks this summer, which led to burn ban restrictions in most of the park units. Therefore, no prescribed burns were conducted through the Fall burning months of September and October.

This was the third year of a three year research project at Wind Cave N.P., Jewel Cave N.M., and Devils Tower N.M. in which Dan Swanson partnered with Amy Symstad of the USGS assessing the relationship between prescribed fire burn severity and target invasive plant species abundance taking into account a variety of pre- and post-fire environmental characteristics at each park. This past season two seasonals collected year two post-burn data on 90 plots at Wind Cave N.P. and Jewel Cave N.M. Data analysis comparing preburn to year one post-burn effects indicate that most invasive plant species did not significantly increase in cover one growing season after the prescribed fire at Wind Cave N.P. and Jewel Cave N.P.. Bull thistle and common mullein did significantly increase in absolute cover from preburn to year one, however it was less than 0.5% absolute change.

This year we continued collaboration with the NPS Northern Great Plains Inventory and Monitoring Network (I&M). The NGP fire effects crew and I&M program installed and read ninety forest, tall shrub, and fuels plots at Wind Cave N.P. this summer which are spatially balanced throughout the park. In addition, we collaborated on reading sixty forest, tall shrub, and fuels plots at Mount Rushmore N.M. to assess the success of the 2010 hazardous fuel reduction project. To reduce the potential for crown fire, nearly all ponderosa pine trees less than 10 inches DBH were cut and chipped or piled in 43% of the Memorial in 2010. Forest structure data collected in sixty plots before and two years after thinning are being used to assess the treatment's effect on forest structure and to model the effectiveness of the thinning in reducing crown fire potential. Since both programs are using the same sampling design and monitoring protocols, we continued to coordinate plot sampling visits this year throughout our park network.

Table 1. Fire Effects Plot Workload (2012) and Total Plots Installed

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn 2012	Imm. Post 2012	Postburn (1-20 yrs) 2012	Annual Total (2012)	Total Plots
Agate Fossil Beds	Mixed grass prairie	Grassland Fuels Veg. Plot (GFV)			1	1	4
	Mixed grass prairie	I&M Veg Plot	6			6	6
Badlands	Mixed grass prairie	FMH Grass Plot			5	5	5
	Mixed grass prairie	GFV Plot			3	3	3
	Mixed grass prairie	I&M Veg Plot	13	7	19	39	34
	Shrubland	FMH Shrub Plot					
Devils Tower	Ponderosa forest	FMH Forest Plot			3	3	15
	Mixed grass prairie	FMH Grass Plot					
	Ponderosa forest	Forest, Fuels, and Veg. Plot (FFV)			2	2	2
	Ponderosa forest	Forest & Fuels Plot (F&F)					3
	Mixed grass prairie	I&M Veg Plot	6				9
Fort Union	Cottonwood forest	FMH Forest Plot					1
	Mixed grass prairie	FMH Grass Plot					2
Jewel Cave	Ponderosa forest	FFV Plot					3
	Ponderosa forest	F&F Plot					3
	Ponderosa forest	FMH Forest			3	3	3
	Ponderosa forest	I&M Forest & Fuels Plot		2		2	62
Knife River	Mixed grass prairie	GFV Plot			5	5	5
	Mixed grass prairie	FMH Grass Plot					
	Green ash forest	FMH Forest Plot					3
	Mixed grass prairie	I&M Veg Plot			6	6	8
Mount Rushmore	Ponderosa forest	I&M Forest & Fuels Plot			50	50	60
Scotts Bluff	Mixed grass prairie	FMH Grass Plot			3	3	6
	Mixed grass prairie	I&M Veg Plot					14
	Juniper Woodland	FMH Forest Plot			2	2	2
	Shrubland	FMH Shrub Plot					1
Theodore Roosevelt	Mixed grass prairie	FMH Grass Plot			3	3	9
	Mixed grass prairie	GFV Plot			2	2	2
	Mixed grass prairie	I&M Veg Plot			3	3	7
	Juniper Woodland	I&M Veg Plot					5
	Cottonwood Forest	FMH Forest Plot					2
	Shrubland	FMH Brush Plot					5
Wind Cave	Mixed grass prairie	FMH Grass Plot			1	2	14
	Ponderosa forest	FMH Forest Plot			1	1	5
	Ponderosa forest	FFV Plot					3
	Ponderosa forest	F&F Plot			11	11	11
	Ponderosa forest	I&M Forest, Veg, & Fuels					14
	Ponderosa forest	I&M Forest & Fuels Plot	29		8	37	90
	Mixed grass prairie	I&M Veg plot					5
	Ponderosa forest	CBI plot					48
Photo Points, various parks	Mixed grass prairie	Photo point			3	3	15
	Ponderosa forest	Photo point			7	7	6
	Juniper woodland	Photo point					7
Total			54	9	141	204	502

Table 2. Fire Ecology Staffing 2012

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ qualified	Training and Development
Dan Swanson	1/1/2012	12/31/2012	26	No	Black Hills Area Bot/Eco workshop, 3 fire operational periods
Phil Graeve	4/23/12	10/18/2012	13	No	Wilderness First Aid and botany training. Elk Butte, Sheepherder Hill, Dakota, Draw, JECA, and MORU Wildfires. FEMO, HECM, FALB, and ICT5. 33 fire operational periods.
Valena Hofman	5/7/2012	10/18/2012	12	No	Wilderness First Aid, botany training, 28-day assignment with BLHI WFM, worked on FALA, FFT1, 28 fire operational periods
Marcus Lund	5/7/2012	8/05/2012	6.5	No	L380, Wilderness First Aid, botany training
Ellery Watson	5/7/2012	10/18/2012	12	No	Wilderness First Aid, S-130/190, botany training, 14-day assignment with BLHI WFM, 14 fire operational periods
Dan Townsend	8/13/2012	9/20/2012	3	No	

Table 3. 2012 Management Objectives and Monitoring Results

All results shown are 80% confidence intervals of the mean. Fuel reduction objectives/results are mean percent reduction from pre-burn to immediate post-burn. Stand density objectives/results are for five-year post-burn mean stand density. An underlined number of plots indicates that the minimum sample size has been attained for that variable.

Park	Monitoring Unit	Management Objective	Monitoring Results (80% C.I.)	Objective Achieved	Year Last Analysis Completed (Range of data included in analysis)
Wind Cave N.P.	Native Mixed-grass Prairie	Increase the relative cover of native grasses by at least 10% within two growing seasons after the burn Increase the relative cover of native forbs by at least 30% within two growing seasons after the burn Decrease the relative cover of non-native grasses by at least 20% within two growing seasons after the burn.	5% Decrease No change 23% Decrease	No; N=7 No; N= <u>7</u> Yes; N=6	2008
	Non-native Grass Prairie	Increase the relative cover of native grasses by at least 20% within two growing seasons after the burn Increase the relative cover of native forbs by at least 20% within two growing seasons after the burn Decrease the relative cover of non-native grasses by at least 30% within two growing seasons after the burn.	59% Increase No change No change	Yes; N=5 No; N=5 No; N= <u>5</u>	2008
	Ponderosa Pine Forest	Increase the relative cover of native herbs by at least 25% within two growing seasons after the burn Decrease the relative cover of non-native herbs by at least 25% within two growing seasons after the burn Reduce the density of overstory ponderosa pine (≥ 14.9 cm dbh) by at least 30% two growing seasons after the burn. Reduce the density of pole-size ponderosa pine (2.5 – 14.8 cm dbh) by at least 50% two growing seasons after the burn. Reduce the density of seedling ponderosa pine by at least 70% one growing season after the burn Reduce total fuel loading by at least 30% following one prescribed burn	17% Decrease No change 6% Decrease No change 78% Decrease 21% Decrease	No; N= <u>5</u> No; N=5 No; N= <u>9</u> No; N=9 Yes; N= <u>9</u> No; N= <u>9</u>	2008
Devils Tower N.M.	Non-native Grass Prairie	Increase the relative cover of native grasses by at least 10% within two growing seasons after the burn Increase the relative cover of native forbs by at least 20% within two growing seasons after the burn Decrease the relative cover of non-native grasses by at least 20% within two growing seasons after the burn.	39% Increase 74% Increase 49% Decrease	Yes; N=3 Yes; N=3 Yes; N=3	2008
	Ponderosa Pine	Increase the relative cover of native grasses by at least 10% within two growing seasons after the burn Increase the relative cover of native forbs by at least 10% within two growing seasons after the burn Decrease the relative cover of non-native grasses by at least 30% within two growing seasons after the burn. Reduce total fuel loading by at least 30% following one prescribed burn	13% Increase 36% Increase No change 38% Decrease	Yes; N=7 Yes; N=6 No; N=7 Yes; N=7	2008
Badlands N.P.	Western wheatgrass	Increase the relative cover of native grasses by at least 10% within two growing seasons after the burn	6% Decrease	No; N=20	2008
	Mixed-grass	Increase the relative cover of native forbs by at least 30%	4% Increase	No; N=18	

	Prairie	within two growing seasons after the burn Decrease the relative cover of non-native grasses by at least 20% within two growing seasons after the burn.	No change	No; N=19	
	Non-native grass Prairie	Increase the relative cover of native grasses by at least 10% within two growing seasons after the burn	30% Increase	Yes; N=4	2008
		Increase the relative cover of native forbs by at least 10% within two growing seasons after the burn Decrease the relative cover of non-native grasses by at least 30% within two growing seasons after the burn.	37% Increase No change	Yes; N=4 No; N=4	
Theodore Roosevelt N.P.	Kentucky Bluegrass Non-native Prairie	Increase the relative cover of native grasses by at least 20% within two growing seasons after the burn	57% Increase	Yes; N=3	2008
		Increase the relative cover of native forbs by at least 20% within two growing seasons after the burn	No change	No; N=3	
		Decrease the relative cover of non-native grasses by at least 30% within two growing seasons after the burn.	3% Decrease	No; N=3	
	Crested Wheatgrass Non-native Prairie	Increase the relative cover of native grasses by at least 20% within five growing seasons after the burn	No change	No; N=3	2008
		Decrease the relative cover of non-native grasses by at least 20% within five growing seasons after the burn.	No change	No; N=3	
	Native Mixed-grass Prairie	Increase the relative cover of native grasses by at least 20% within five growing seasons after the burn	8% Increase	No; N=3	2008
		Decrease the relative cover of non-native herbs by at least 20% within two growing seasons after the burn.	8% Increase	No; N=3	
Agate Fossil Beds N.M.	Native Mixed-grass Prairie	Increase the relative cover of native grasses by at least 20% within two growing seasons after the burn.	5% Increase (Yr 1)	TBD	2009
		Decrease the relative cover of non-native herbs by at least 20% within two growing seasons after the burn.	31% Decrease (Yr1)	TBD	

Wind Cave N.P.

The largest prescribed burn in the history of Wind Cave N.P. was completed October 20-21, 2010. The 3,450 acre American Elk unit was located primarily within forested communities of the park, but also included mixed-grass prairie, prairie dog towns, and ponderosa pine encroached meadows. The primary objective of the burn was to restore fire back into the project area since most of the unit hadn't experienced fire since the Park's creation in 1903. Additional resource objectives included reducing overstory, pole, and seedling densities. We also wanted to decrease the dead and down fuel loading within the forested communities and encroachment of ponderosa pine regeneration at the forest-prairie ecotone.

The first day of the burn consisted of two ignition teams blacklining approximately 12 miles of burn perimeter. Day two involved blacklining the final half-mile of burn perimeter and interior helicopter ignition. Approximately 39% of the unit was unburned to low, 29% low-low moderate, 26% moderate, and 6% high severity (Figure 1) based on the analysis of 48 CBI plots that were installed within the four burn severity classes.

This unit had seventy-five fire effects monitoring plots established in it which was the most for any unit and park within the Northern Great Plains park group. Fifty-seven of these plots were associated with a three-year invasive plant research project which was funded by research reserve funds. Since the research project's sampling design and plot layout were identical to most of the Northern Great Plains fire effects plots, I was able to analyze sixty of the fire effects plots together. All plots were read pre-burn between 2008 and 2010 and year 1 post-burn in 2011. Resource objectives included: 1) Achieve 20-50% mortality in overstory ponderosa pine (>6" dbh), 2.) Achieve 50-70% mortality in pole-size ponderosa pine (1-6" dbh), 3.) Achieve 70-95% mortality in ponderosa pine seedlings, 4.) Achieve > 40% reduction in 100 and 1000 hr fuel loading.

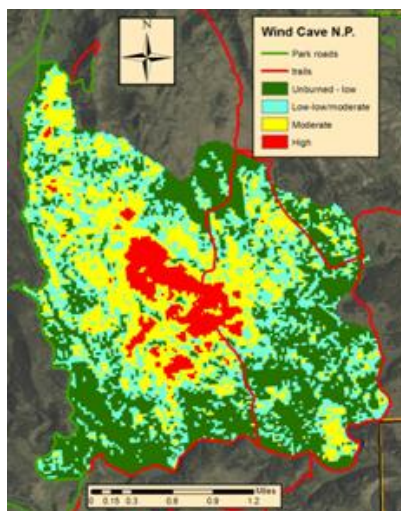


Figure 1. American Elk prescribed fire calibrated burn severity assessment map



Passive tree torching shortly after helicopter ignition commenced on October 21.

The paired fire effects data was analyzed for relative change using ratio of means (RoM) at an 80% confidence level. There was an average 29% mortality of overstory ponderosa pine trees with 80% confidence that it decreased between 23 and 37%. Pole-sized ponderosa pine decreased an average 64% with 80% confidence the mortality was between 55 and 72%. Ponderosa pine seedlings decreased an average 72% with 80% confidence the mortality was between 59 and 81%. 100 hr fuels decreased an average 61% with 80% confidence this fuel loading class decreased between 51 and 70%. 1000 hr fuels decreased by 36% with 80% confidence this fuel loading class decreased between 11 and 50%. Four of the five resource objectives were met and statistically significant with the fifth objective (1000 hr fuels) only slightly below target levels.

The several thousand acre unit allowed the prescribed fire to burn over multiple burn periods and weather conditions which replicates natural fire activity. The use of a helicopter provided for fire fighter safety by eliminating the need for interior hand ignition and enabled us to achieve a mosaic of burn severities across the landscape. Prescribed burns at Wind Cave N.P. are an integral tool for restoring these forests to their naturally diverse structure.

Badlands N.P.

The 1969 acre Interior prescribed burn was completed on September 11, 2010, in a vegetation type consisting of native perennial and non-native annual grasses. This was the first entry of fire into this unit. Seven plots were installed within the unit in June 2010 and post-burn monitoring indicated that the majority of the transect points had a moderate burn severity. Plots were monitored the first and second growing season following the prescribed fire. Primary objectives included increasing native grass and forb cover while decreasing non-native grass cover.

The paired fire effects data was analyzed for relative change from pre-burn to second growing season after prescribed fire using ratio of means (RoM) at an 80% confidence level. There was an average 91% decrease in non-native forb cover with 80% confidence that it decreased between 83 and 96% (Figure 2). Native forb cover decreased by an average of 72% with 80% confidence level that it decreased between 52 and 82%. Non-native grass cover significantly decreased by an average of 96% and native grass cover was essentially unchanged.

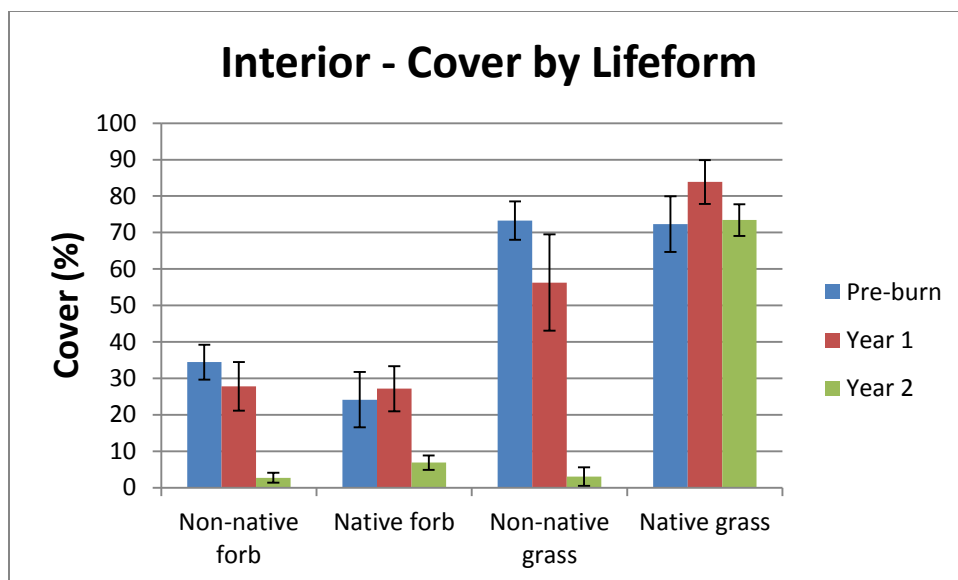


Figure 2 Changes in vegetative cover by lifeform for seven plots within the Interior unit after the first prescribed burn.

Figure 3 shows that the two most abundant non-native plants in the plots, Japanese brome and yellow sweetclover, significantly decreased two growing seasons after the fire. Japanese brome decreased in cover by an average of 97% while yellow sweetclover decreased by an average of 89%. Western wheatgrass also significantly decreased in cover and with 80% confidence that it was between 10 and 26%. Needleleaf sedge cover significantly increased from just under 1% to almost 12% cover. Blue grama, threadleaf sedge, and Needle & Thread did not significantly change in cover.

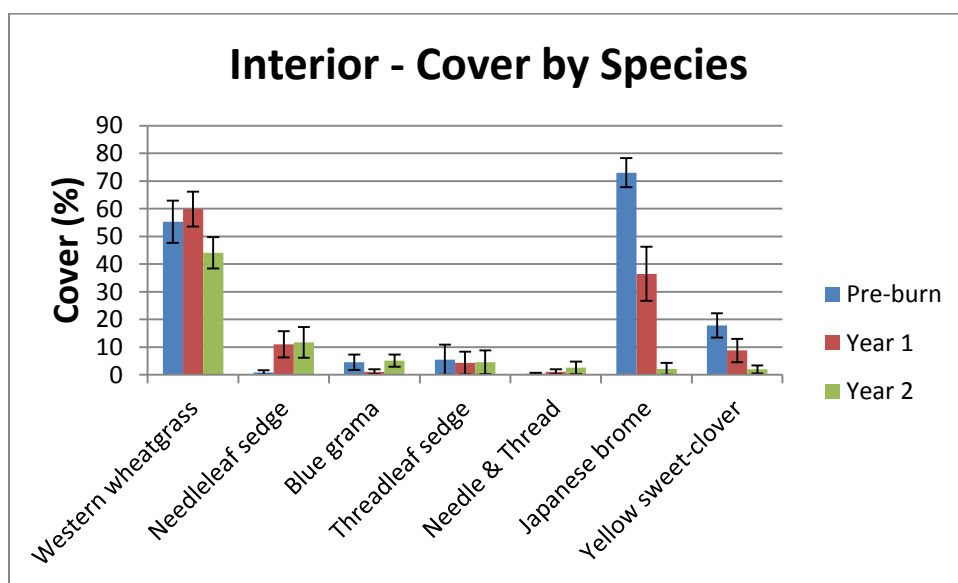


Figure 3 Changes in vegetative cover by species for seven plots within the Interior unit after the first prescribed burn.

Decreases in vegetative cover for native and non-native forbs and non-native grasses is likely partly attributed that the pre-burn plots read in June 2010 were in the midst of a wet cycle (2009-2011) and those read in June 2011 were at the beginning of a drought cycle. It is desirable to see that the most significant declines in cover were from Japanese brome and yellow sweet clover, and that the native grasses showed either only a minor decrease or no change in cover.

Mount Rushmore N.M.

Prompted by an ongoing mountain pine beetle outbreak in the central Black Hills, staff at Mount Rushmore requested assistance from the Midwest Regional Office in February 2010 to help prepare a plan to mitigate the impacts of a potential mountain pine beetle infestation. A plan was completed by a small group of specialists with input from memorial staff, the Black Hills National Forest, and other local stakeholders. 544 acres were either thin and piled or thin and chipped in late summer and Fall of 2010. Project parameters included cutting trees with 6 inch dbh or less within the thin/pile area and 10 inch dbh or less within the thin/chip area. The NGP fire effects and I&M crews installed and read 60 forest structure and fuels plots within the park in 2010 prior to this project's implementation as well as reread the same plots in the summer of 2012 to assess the success of the project. Ponderosa pine density in the 1 to 4" and 4 to 7" dbh class decreased by an average of 97% and 86% respectively in the thin and pile treatment unit (Figure 4).

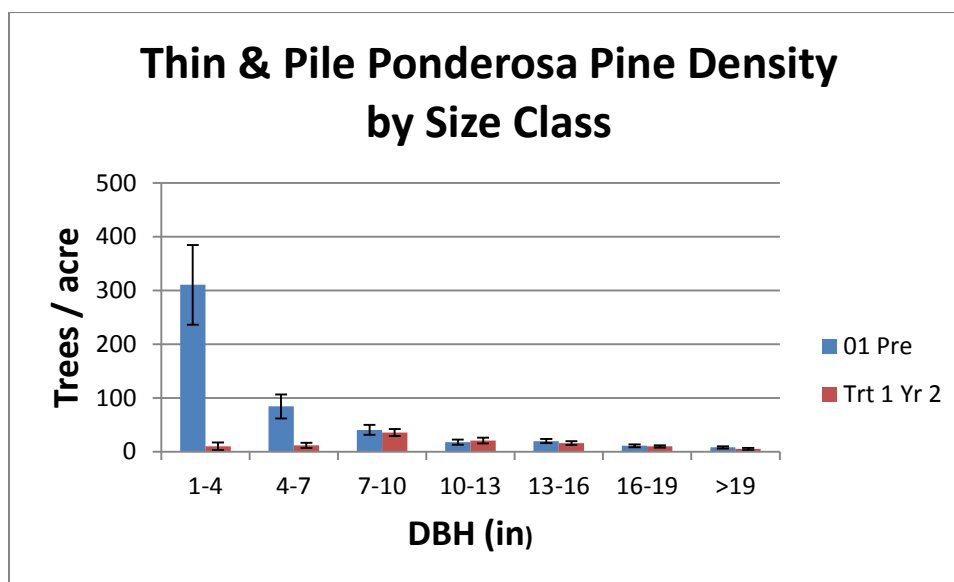


Figure 4 Changes in forest structure by size class in 13 monitoring plots within the thin & pile treatment area at Mount Rushmore N.M. following the hazardous fuel reduction project.

Total fuel loading increased by an average of 18% in the thin and pile treatment area (Figure 5). Only one of the ten monitoring plots had their associated piles burned as of the summer 2012 read. The NGP fire management program continues to burn piles at Mount Rushmore in the winter months as weather conditions allow. Ponderosa pine density in the 1 to 4" and 4 to 7" dbh class decreased by an average of 99% and 96% respectively in the thin and chip treatment unit (Figure 6). There was also a 52% decrease in ponderosa density in the 7 to 10" dbh class as the contract allowed for thinning up to 10" dbh.

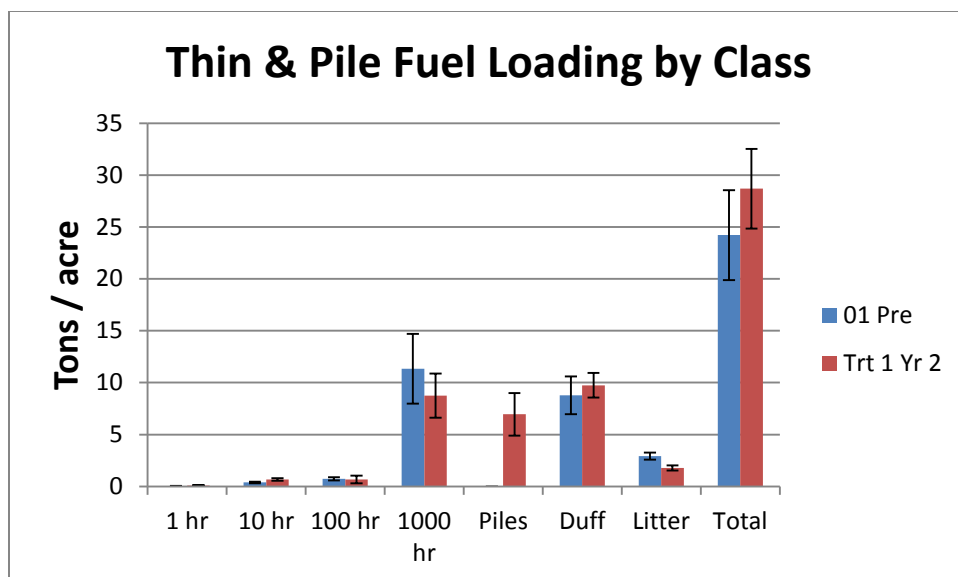


Figure 5 Changes in fuel loading in 10 monitoring plots within the thin & pile treatment area at Mount Rushmore N.M. following the hazardous fuel reduction project.

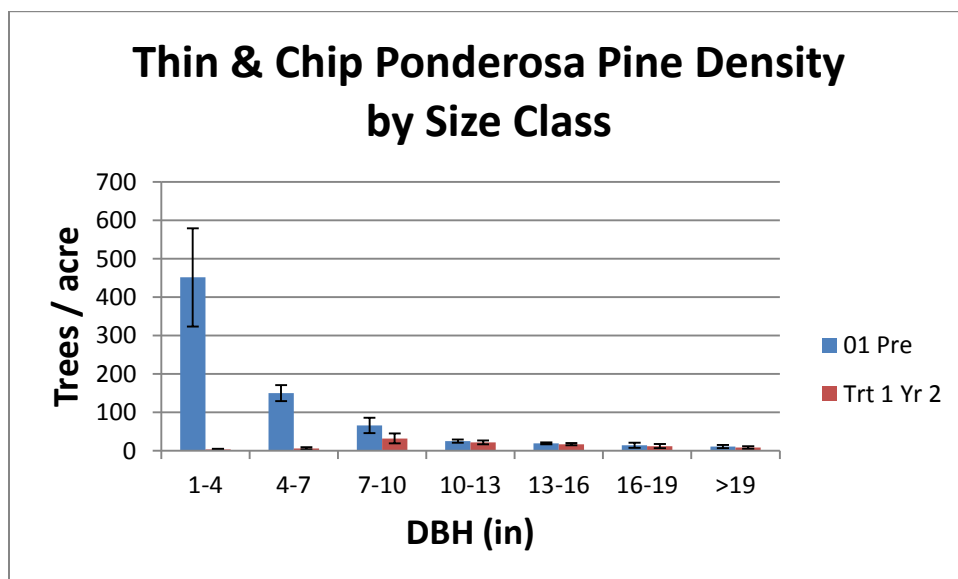


Figure 6 Changes in forest structure by size class in 13 monitoring plots within the thin & chip treatment area at Mount Rushmore N.M. following the hazardous fuel reduction project.

Total fuel loading increased by an average of 29% in the thin and chip treatment area (Figure 7). Most of the fuel loading increased in the 1 hr, 10 hr, and litter fuel classes as these are the primary fuel classes that compose the chips.

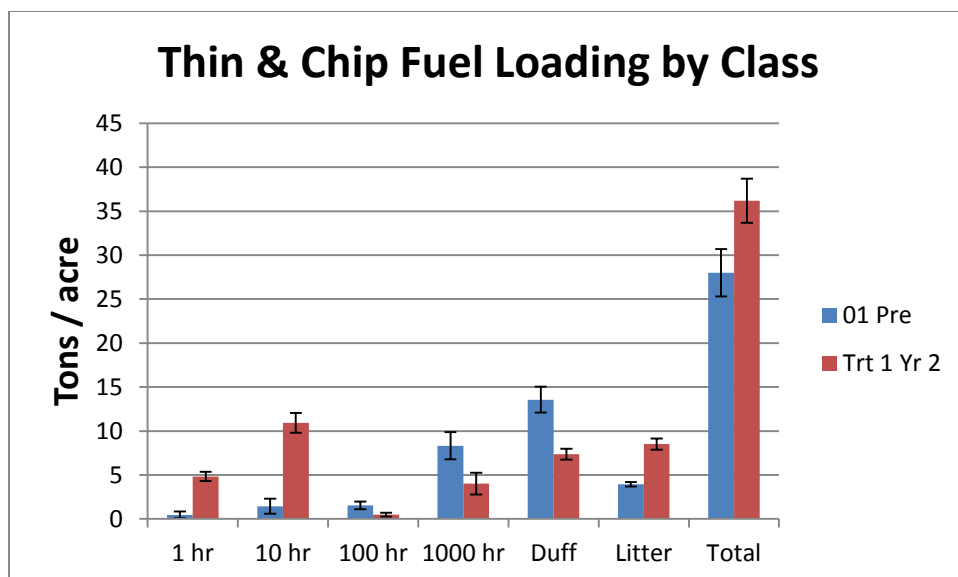


Figure 7 Changes in fuel loading in 12 monitoring plots within the thin & chip treatment area at Mount Rushmore N.M. following the hazardous fuel reduction project.

Removing most of the smaller trees greatly reduces the potential for a stand-replacing crown fire within the memorial. These smaller trees act as a ladder fuel, and would carry fire into the crowns of the large, mature trees in the event of a fire. This also makes it more feasible to utilize prescribed fire at the memorial, which is the next step in restoring the old-growth ponderosa pine forest. Ultimately, it is the hope that these treatments will make the forest more resilient and resistant to infestation of mountain pine beetle.

B. Fire ecologist accomplishments and areas of focus

Dan edited the following documents: fire regime component for Theodore Roosevelt N.P.'s natural resource condition assessment, Integrative forest stewardship strategy, and Mount Rushmore N.M. flying squirrel study. Dan is also currently involved in a climate change research project at Wind Cave N.P. which will be finalized next year.

In February and March Dan gave presentations at the Black Hills Area botanist & ecologist workshop and the Northern Great Plains Network technical committee meeting on the results from the composite burn index (CBI) data analysis from the 2010 American Elk RX burn at Wind Cave N.P.

In May, we finished integrating our FFI databases between our programs, and we now have one database per park which is housed on the server located in the Northern Great Plains I&M office in Rapid City. The NGP fire ecology program now connects to their server to enter FFI data which streamlines data management and analysis for both programs. This past field season both programs successfully entered their biological data directly into this shared database. Following the database migration only minor issues were observed including duplicate species, occasional instances where GUIDs were present instead of species codes, and a significant slowdown to the results executed from the query module. By early next year, our IT specialist will have copies of the FFI databases backed up daily on the Wind Cave server so that I can execute the query and reports and analysis modules in a more efficient manner.

Table 4. Fire Ecologist 2012 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	6%	Determining fire effects travel costs to area parks, training of field crew in FFI
Presentations	5%	Scientific meetings, park staff, public, etc.
NPS Meetings/ task groups	7%	Park, I&M, & FESC meetings; NGP Technical Committee meeting; Worked on THRO Natural Resource Condition assessment;
Interagency work	1%	Black Hills Area Ecologist & Botanist Workshop; Southern Rockies Fire Science Consortia meeting
Wildfire Assignments	1%	MORU WF
Prescribed fire projects	1%	FEMO on 1 RX fire (1 operational period)
Non-fire fuels projects	0%	
Research	8%	Invasive plant species research project – training field crew
Data Collection	16%	BADL, MORU, WICA, THRO, & KNRI fire effects & I&M plot work; Invasive plant species research project – WICA;
Data entry, check	4%	MORU data entry; MORU & WICA data checking
Data management & analysis	30%	Northern Great Plains area parks fire effects database management and analysis
Supervision/Admin	15%	Hiring, supervision, travel, payroll, etc.
Training	3%	Botany, Supervisory, EEO training
Travel out-of-park for plot or project work	2%	Travel to BADL, KNRI, & THRO for monitoring and RX fires
Miscellaneous	1%	NGP fire management web site, Writing burn reports

C. Fire effects crew accomplishments and areas of focus**Table 5. Fire Effects Crew 2012 Accomplishments/Focus Areas**

Category	Percent Time	Notes
FMH plots	7%	Re-reading of FMH plots (Forest, Grass, and Brush)
NGP Plots	8%	Re-reading of burn-unit specific plots (FFV, GFV, photo points)
I&M Plots	36%	Installing & rereading I&M style plots. At WICA these were installed park-wide. All other parks' installs fell inside active burn units.
WUI plots	0%	
Wildfire assignments	9%	Wildfire assignments, including local I.A., details with the Black Hills Wildland Fire Module
Prescribed fire projects	1%	Prescribed fires in the NGP park group, calendar year 2012
Non-fire fuels projects	1%	Estimated amount of time spent assisting with non-fire fuels projects; Wind Cave canyon fuel reduction project
Travel out-of-park for plot or project work	4%	Travel to AGFO, SCBL, DETO, BADL, THRO, & KNRI for monitoring and RX fires
Data entry, check	12%	100% of plot data entered & 100% checked in FFI as of 11/27/12

Data analysis	0%	
Supervision/Admin	11%	Travel, payroll, field season preparation, equipment upkeep and repair, end of season closeout
Training	8%	Each crewmember had botany training & Wilderness First Aid training. Additional courses taken by some individuals include S-130/190, L 380.
Miscellaneous	3%	physical training, fuel sampling, herbarium updates.

D. Additional Program Information

Table 6. Planning - 2012

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 2012)	Assisted with how many BAER plans in 2012?
Agate Fossil Beds N.M.	no	2004	0	0
Badlands N.P.	no	2003	0	0
Devils Tower N.M.	yes	2004	0	0
Fort Union Trading Post NHS	no	2007	0	0
Jewel Cave N.M.	no	2004	0	0
Knife River Indian Villages NHS	no	2007	0	0
Mount Rushmore N.M.	yes	2007	0	0
Scotts Bluff N.M.	yes	2004	0	0
Theodore Roosevelt N.P.	no	2007	0	0
Wind Cave N.P.	no	2005	0	0

Table 7. Monitoring – 2012

Park	% 2012 Data Entered	% 2012 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Agate Fossil Beds N.M.	100%	100%	2	0	0	0
Badlands N.P.	100%	100%	8	0	0	0
Devils Tower N.M.	100%	100%	4	0	0	0
Fort Union Trading Post NHS	100%	100%	0	0	0	0
Jewel Cave N.M.	100%	100%	2	0	1	0
Knife River Indian Villages NHS	100%	100%	5	0	0	0
Mount Rushmore N.M.	100%	100%	0	1	0	0
Scotts Bluff N.M.	100%	100%	1	0	0	0
Theodore Roosevelt N.P.	100%	100%	4	0	0	0
Wind Cave N.P.	100%	100%	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.

Table 8. Communicating Results – 2012

Park	# of Project Monitoring Reports completed in 2012	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Agate Fossil Beds N.M.	0	1	1	Yes
Badlands N.P.	0	1	1	Yes
Devils Tower N.M.	0	1	1	Yes
Fort Union Trading Post NHS	0	0	1	Yes
Jewel Cave N.M.	0	1	1	Yes
Knife River Indian Villages NHS	0	0	1	Yes
Mount Rushmore N.M.	0	0	1	Yes
Scotts Bluff N.M.	0	1	1	Yes
Theodore Roosevelt N.P.	0	0	1	Yes
Wind Cave N.P.	0	0	1	Yes

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

Table 9. Research – 2012

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2012	# of Proposals Funded in 2012	# of Research Projects Supported in 2012*	Additional Comments
Agate Fossil Beds N.M.	no	0	0	0	
Badlands N.P.	no	0	0	0	
Devils Tower N.M.	no	0	0	1	Invasive Spp project
Fort Union Trading Post NHS	no	0	0		
Jewel Cave N.M.	no	0	0	1	Invasive Spp project
Knife River Indian Villages NHS	no	0	0	0	
Mount Rushmore N.M.	no	0	0	0	
Scotts Bluff N.M.	no	0	0	0	
Theodore Roosevelt N.P.	no	0	0	0	
Wind Cave N.P.	no	0	0	1	Invasive Spp project

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

Reserve Fund Research: If your park(s) received Reserve Fund Research funding or completed a previously-funded project in the last year, please provide the following:

Determine strategies for efficient early detection of invasive plants after prescribed fire

- **Current project status (short description):** The third and final field season was completed in 2012. Field collection was done only at Wind Cave N.P. and Jewel Cave N.M. since the prescribed fire at Devils Tower N.M. wasn't completed. 2010 through 2012 data has been entered and checked in FFI. Data analysis is currently ongoing and final report will be written in early 2013.
- **Expected project completion date:** Spring 2013
- **Expected List of deliverables:** A final presentation on the results of the research to Northern Great Plains Fire Management staff and other interested parties, as well as at the regional Black Hills Area Botanist and Ecologist Workshop (March 2013) and George Wright Society biennial meeting in Denver (March 2013).
- Article submission to *RX Effects* in late winter 2014 on projects results and analysis.
- Hard and electronic copies of recommended search strategy to each park's natural resource management program and to the Northern Great Plains Fire Ecology program, in the form of a final report or published journal article.
- All data will be provided to park natural resource divisions, with occurrences of target invasive species highlighted. Data will also be maintained in the NPS Northern Great Plains Fire Ecology program's database.
- Annual presentations to natural resource and fire management staff of the three parks on the progress and results of the research.

E. 2013 Direction

Budget cuts will hit the Northern Great Plains fire ecology program again in FY13. Our seasonal fire effects staffing will be reduced from 36 to 24. As a result we will be hiring two seasonals instead of three for the 2013 field season. In addition, it's likely that fire effects travel funds will not be given to fire ecology programs in the Midwest Region this year and into the future, so we hope that prescribed fire project funds will cover this expense. If not we will need to use either support funds or have seasonals on for shorter seasons to travel to out-of-area parks.

I understand that we have come to a point where we must prioritize our monitoring efforts within our park group due to fiscal and personnel constraints. It's likely we won't be able to monitor as many prescribed fire projects in the future and may have fewer plots in those projects in which monitoring does take place. I will continue to engage with Park group FMOs and resource managers to determine what their priorities are for monitoring. We may also have to drop some monitoring reads in this "new normal". The NGP fire effects monitoring crew, Black Hills Fire Use Module, and Wind Cave N.P. engine crew will also help each other get work done throughout their core seasons. The Black Hills Fire Use Module and Wind Cave N.P. engine crew are also short on staff, so by working together we will maximize our productivity and maintain our viability.

F. Optional Information

To help in the ongoing effort to improve FFI, please include any feedback or suggestions here based on your experiences using FFI.

It would be nice if you could select “monitoring status” in the Event portion of the Grouping and Summary Calculations tab when I am setting up a query. I group my plots by monitoring status and not date when I set up queries, and FFI only allows the user to select monitoring status when you have the “Selected Project Units” radio button selected. If I select the “All Project Units” radio button, I now can only select by Date in the Event section of Grouping and Summary Calculations. This would expedite my queries because now I could select all the plots I want to do analysis for at the park level at once instead of doing it at the project unit level.

In addition, it would be nice if there were four significant digits instead of three within the “Plot size” field of the Trees – Individuals (m) protocol. I noticed that FFI introduces error when I compare tree density calculated from FFI versus “actual” tree density in some of our smaller size monitoring plots.

INSTRUCTIONS FOR UPLOADING 2012 ANNUAL REPORT

1. Save your report as a PDF file using the following file naming convention “2012 *Park/Network Name* Annual Report.pdf”.
2. Go to the NPS Fire Ecology Sharepoint site (<http://npsfamshare.nps.doi.net/wildlandfire/firescience/fireecology/default.aspx>). In Fire Ecology Documents, upload your report to the 2012 Park and Network Fire Ecology Program Annual Reports folder.
3. Please e-mail your regional ecologist, Nate Benson, and MaryBeth Keifer to let us know when you get your report uploaded.

Call MaryBeth Keifer (603-795-2333) or Nate Benson (208-387-5219) if you have any questions or problems.