



National Park Service Fire Ecology Annual Report Calendar Year 2013

Northern Great Lakes Area Parks (VOYA, SACN, GRPO, ISRO, APIS)
Fire Ecologist, Scott Weyenberg

A. Summary

The 2013 fire season was late in coming due to abundant snowfall in April. It was also very short with only one or two very active days. An attempt was made to complete burns at St. Croix, however, two large fires were burning in Minnesota and Wisconsin so crews were made available for suppression instead. As a result, no burns were completed at any of the parks in the northern park group.

The sampling load was very light at both VOYA and SACN. The Fire Ecologist traveled to VOYA to complete most of the fire effects sampling with the remainder being completed by the resident fire effects monitor and the fire crew. The ecologist and monitor spent a week with a researcher from the University of Minnesota collecting fire scar and tree core samples from the southeast portion of the park. Approximately 50 scar samples were collected, which will be analyzed by University students. The ecologist has collaborated with the dendrology program in recent years to get technical assistance with fire scar analysis. This has become an avenue in which the park can get research done on fire history while the dendrology program benefits from having access to fire history data and logistical support. All sampling at SACN was completed by the ecologist.

The ecologist went on one three week fire assignment to Oregon. He was a member of a 20 person crew and worked as a sawyer and squad boss. The fire effects monitor was not able to go on any out-of-state fires due to a relatively short work season.

Table 1. Fire Effects Plot Workload (2013) and Total Plots Installed

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Annual Total	Total Plots
Voyageurs	Red/White Pine	FMH forest plot			2	2	34
	Mixedwood	FMH forest plot			1	1	13
	Jack Pine	FMH forest plot			2	2	12
Voyageurs	Red/White Pine	Herbs/woody stems *					77
	Mixedwood	Herbs/woody stems *					15
	Aspen/Birch	Herbs/woody stems *					8
	Sedge Meadow	Herbs/woody stems *					6
	Oak Savanna	Herbs/woody stems *			3		3
Voyageurs	Red/White Pine	Photo Points			12	12	12
	Jack Pine	Photo Points					1
	Mixedwood	Photo Points					6
	Oak Barrens	Photo Points					1
	Sedge Meadow	Photo Points					1
St. Croix NSR	Tallgrass Prairie	Herbs/woody stems *	5			5	26
	Glade	Invasive species†	30			30	30
	Glade	Herbs/woody stems *					3
	Jack Pine Barrens	Herbs/woody stems *					13
	Pine/Oak Forest	Herbs/woody stems *					6
	Oak Savanna	Herbs/woody stems *			10		7
Total			35	0	20	55	274

* Protocols include photos, point intercept, frequency frames, fixed & variable radius plots.

†Protocols include counts of select species in 1m frequency squares.

Table 2. Fire Ecology Staffing 2013

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Scott Weyenberg	1/1/13	12/31/13	26	No	LiDAR webinar, NPS required training
Lisa Reatz	5/20/13	8/15/13	7	No	NPS required training

There was no money available for travel, which excludes most training.

Table 3. 2013 Management Objectives and Monitoring Results

Fuel reduction objectives/results are mean percent reduction from pre-burn to immediate post-burn. Woody stem density objectives/results are for 2-5 year post-burn mean density. Herbaceous objectives for the SACN units are long term 20+ year objectives.

Burn or Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?	Year Last Analysis Completed
VOYA				
Red & white pine (n = 9)	Prepare seedbeds, increase herbaceous layer diversity. Analysis compared spring to summer fires.	Identified a suite of generalist species present after all burns and a suite of species specific to summer burns only. Manuscript accepted by Natural Areas Journal, 2013.	Yes	2012 -2013 (1997-2012)*
Mixedwood (n = 25)	Increase diversity in all canopy strata and in stand age. Analysis compared spring to summer fires.	Discovered suite of generalist species present after all burns and suite of species specific to summer burns only. See attached report.	Yes	2011 (1990-2010)
Section 33 (n = 29)	Monitored "fire use" fire.	Included in above two analyses.	NA	2011 (2004-2009)
Whispering Pines II (n = 20)	Reduce fuel load by 30-80% Reduce litter depth by 90%. Reduce ABBA density by 30%.	1-100 hr fuels -21 to +55% (p = 0.47) 1000 hr fuels -53 to +26% (p = 0.56) Litter depth -45 to -77% (p = 0.0000) ABBA density -22 to -98% (p=0.007)	No No Yes	2010 (2008)
Gagnon (n = 4)	Reduce brush cover by 50% Reduce duff depth.	12-58% reduction by 01yr03 (n = 4). 77% reduction (n=1)	Yes Yes	2010 (2007-2010) (2007)
Mica Bay area (n = 3)	Maintain overstory current density $\pm 10\%$. Decrease sapling density by 30%. Reduce litter & duff loading by 60 – 80%. Exposed mineral soil on >20% of site. Reduce CW fuels 30-80%	Basal area 170 -180 ft ² /ac. No change. 60 - 100% reduction. 75 – 100% reduction. 25% mineral soil exposure immediate post burn. 1-100hr fuels +160%. 1000hr fuels +276%.	Yes Yes Yes No	2010 (2007-2010)
Tar Point (n = 6)	Reduce CW fuels by 30 - 80%. Reduce litter by 90%.	1-100hr fuels -37% (p = 0.25) 1000hr fuels -6% (p = 0.28)	No	2009 (2008-2009)
Mica Island & Squab Island	30-80% Reduction in fuels. Reduce ABBA density to <200 tpa (Mica Isl.).	0-3" fuels: Mica: +46 to +176%, (n=6) (p=0.02). Squab: +38 to -115% (n=6) (p=0.19). 3"+ fuels: Mica: +19 to -131% (n=6) (p = 0.19) Squab: -31 to -102% (n=6) (p = 0.01) ABBA density: 21 to 278 tpa. n=10 plots. (p = 0.24)	No – Mica Isl. No – Squab Isl. No – Mica Isl. Yes – Squab Isl. No – Mica Isl.	2007 (2007) 2010 (2007-2010)

Burn or Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?	Year Last Analysis Completed
Red pine – White pine forest (n=14 plots, 8 fires)	60-90% Reduction in 0-1” fuels.	0-1” fuels - 67% reduction; to a 200% increase.	No	2004 (1989 – 2004)
	50-70% Reduction in 1-3” fuels.	1-3” fuels: 56% decrease to a 43% increase.	No	
	50-70% Mortality in pole sized balsam fir.	Pole sized ABBA: 39-100% mortality.	Yes	
	Regenerate white pine seedlings.	Seedling counts 5 years post: increased 27-400%, (decreases found on two sites).	Yes	
SACN				
Sterling Prairie (n = 4)	Target cover: Native grass 50-80% Non-native grass<10% Native forbs.....25-50% Non-native forbs..... <2%	Current conditions: Native grass 56% Non-native grass 59% Native forbs.....9% Non-native forbs.....5%	Not yet	2010 (2010)
Sunrise Prairie (n = 4)	Target cover: Native grass 40-70% Non-native grass<10% Native forbs.....20-35% Non-native forbs..... <2%	Current conditions: Native grass 45% Non-native grass 30% Native forbs.....19% Non-native forbs.....4%	Not yet	2010 (2010)
Peaslee Island (n = 4)	Proposed target cover: Native grass 20-80% Non-native grass<10% Native forbs.....25-50% Non-native forbs..... <10%	Current conditions: Native grass 2 - 45% Non-native grass 2 - 32% Native forbs.....4 - 10% Non-native forbs.....2 - 20%	Not yet	2010 (2010)
Olson’s Prairie (n = 4)	Proposed target cover: Native grass 40-70% Non-native grass<5% Native forbs.....15-30% Non-native forbs..... <1%	Current conditions: Native grass 14% Non-native grass 15% Native forbs.....2% Non-native forbs.....<1%	Not yet	2010 (2009)

* Data years included in analysis.

B. Fire ecologist accomplishments and areas of focus

This section deals with roles and functions of the ecologist. Identify accomplishments and/or focus areas along with a rough estimate of the amount of time spent in these areas (see table format and example below). This includes planning documents produced or reviewed (e.g. fire management plans, monitoring plans, prescribed fire or mechanical treatment plans, etc.), presentations given and audience, meetings and task groups attended, contracts reviewed, interagency collaboration efforts, volunteer hours managed, and scientific or research publications produced.

Table 4. Fire Ecologist 2013 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	25%	Wrote 3 burn plans, INDU NFPORS, SACN CWPP, various INDU sampling plans, SACN FEMP, INDU mech. thinning plan, SACN burn unit prioritization.
Presentations	2%	Taught Rx 310 Flora section, Presentation to school kids.
NPS Meetings/ task groups	0%	
Interagency work	6%	MNICS Rx fire and Fuels Working Group, IFTDSS testing.
Wildfire assignments	14%	FFT1 on two fire assignments.
Prescribed fire projects	3%	Prep for Arcola burn.
Non-fire fuels projects	0%	
Research	15%	Manuscript preparation (VOYA), fire history sampling.
Data collection	13%	Sampling at VOYA and SACN
Data entry	<1%	Estimated amount of time spent entering data from paper to PC
Data analysis	14%	INDU Dune Ridge report, INDU Slash study report, INDU sensitive species, INDU Comprehensive Fuels report.
Supervision/Admin	5%	Hiring, supervision, payroll, travel authorization/vouchers, purchasing, etc.
Training	3%	
Travel out-of-park for plot or project work	<1%	Travel to VOYA.
Miscellaneous	<1%	Things that don't fit in other categories

C. Fire effects crew accomplishments and areas of focus**Table 5. Fire Effects Crew 2013 Accomplishments/Focus Areas**

Category	Percent Time	Notes
FMH plots	20	Sampling of 5 FMH plots and 12 photo plots
WUI plots		
CBI plots		
Other plot work	10	Assisted with fire history sampling (tree cores, fire scars).
Wildfire assignments		
Prescribed fire projects		
Non-fire fuels projects		
Travel out-of-park for plot or project work		
Data entry	30	Data entry, scanning all old field forms.
Data analysis	20	INDU Comprehensive Fuels analysis.
Supervision/Admin	5	Payroll, travel authorization/voucher, etc.

Training	10	NPS required training
Miscellaneous	5	Assisting with misc. fire activities.

D. Additional Program Information

Table 6. Planning - 2013

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?
Voyageurs National Park	yes	2010	27	0
Grand Portage NM	don't know	No	0	0
St. Croix NSR	Yes	No	10	0

Table 7. Monitoring - 2013

Park	% 2013 Data Entered	% 2013 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Voyageurs National Park	90%	0%	3	1	1	0
Grand Portage NM	na	na	0	0	0	0
St. Croix NSR	0%	0%	1	0	0	0
Isle Royale	na	na	0	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 - 2013

Park	# of Project Monitoring Reports completed in 2013	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Voyageurs National Park	1†	0	0	No
St. Croix NSR	0	0	0	

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

† Manuscript.

Table 9. Research - 2013

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2013	# of Proposals Funded in 2013	# of Research Projects Supported in 2013*	Additional Comments
Voyageurs National Park	yes	0	0	0†	
St. Croix NSR	yes	0	0	0	

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

† One unfunded research project was supported at Voyageurs N.P. in cooperation with the U of MN.

E. 2014 Direction

Due to the lack of fire on the ground in northern area parks over the last several years, scheduled monitoring has begun to decrease as roughly 75% of the plots have gone 15 plus years since fire. That said more focus will be put on finding outside sources of funding for prescribed fires. More efforts will be put into planning mechanical treatments at SACN, updating sampling plans and finishing the SACN monitoring plan. Funding will be sought through the SCC, however current applications are for FY 2019 funds, which does not solve the problem for the immediate future. In addition, the ecologist will be going on more fire assignments to help subsidize his salary.

We do not anticipate hiring a fire effects monitor or fire technicians in FY2014. All monitoring will be completed by the ecologist with the help of resource management staff from VOYA and SACN.

F. Optional Information

A fair amount of time was spent by the ecologist preparing a manuscript for publication. The manuscript began as a monitoring report finished in 2012 on the differences between summer and spring fire effects in red and white pine stands at VOYA. It was felt the information was suitable for publication in a peer reviewed journal. Through a partnership with a USGS scientist at INDU, the report was transformed into a manuscript and will be published in Natural Areas Journal some time in 2014.

The fire history project started by the ecologist in 2005 has gotten new life by partnering with a professor at the University of Minnesota. After spending six years collecting tree cores and fire scars opportunistically, the ecologist received money in 2012 to fund technical analyses of the samples by the U of MN dendrology program. The samples were of great interest to their program, and since then the ecologist has partnered with them on the study. In 2013, we were able to nearly double our collection of fire scars covering a large area in the southeastern portion of the park. Nearly have enough samples have been collected to start the work of formally analyzing and publishing the data.

The ecologist worked with SACN resource management staff on a few projects this past year. A biomass harvest treatment has been in the works for the past several years and is now coming to fruition. The harvest is a joint effort with the adjacent land owner, which is a land stewardship cooperative. The project will restore approximately 60 acres of tallgrass prairie and oak savanna. A portion of the land is a Rock Outcrop Glade, which is a Globally Imperiled community. A second project involved visiting and prioritizing all the proposed burn units identified in the Riverway's original FMP. In association with the burn unit prioritization, the Riverway has numerous plantations that it would like to thin. Some of the plantations will be incorporated into the FMP so they can be treated. The ecologist has helped to identify which are worth saving and how they should be treated.

G. Metadata and FFI Database Update on NPS Data Store

As you know, long-term monitoring data are highly valuable! We are glad to have almost all of the NPS FFI databases centrally located on the NPS Data Store. This central data storage option allows us to have an additional secure data location other than those in the parks' or regional offices. It also allows NPS users and others to view the metadata and contact data stewards for access to monitoring data for research or educational purposes. In addition, Landfire staff will be able to download the needed FFI databases directly from the Data Store for Landfire model validation purposes, eliminating the need for NPS staff to respond to another, separate data call.

Once this season's FFI data entry and quality checking are complete, please follow these instructions to update your park(s) metadata ("references") and upload the updated FFI databases to the NPS Data Store.

- 1) Backup the FFI database(s) in FFI (note backup file date for metadata).
- 2) Zip backup file(s) - this step is critical to reduce file size, upload time and server storage space utilized. PLEASE use the following naming convention for your zip files: "**FFI_2013_XXXX**", where XXXX is the 4 letter code for the park, or for the lead park in a network if more than one parks' data are included in the database.
- 3) Access the Data Store at: <https://irma.nps.gov/App/Reference/Welcome>
- 4) Select **Manage**, then **Manage My References** and click on the **Search** button (don't need to enter any search criteria to display all references for which you are an owner).
- 5) Select the reference (metadata record) you wish to update from the list displayed to open the Reference Profile where you can make edits to update the reference.
- 6) Expand "Version History", to view and select the **Manage Versions** option. You will then select **Clone this Reference to Create a New Version** to create a new Reference for this year's update while preserving past metadata and databases as archives.

- 7) Once you **Save** the new, cloned reference, you can make any changes necessary to update the reference with this year's information. Most likely, the edits will be to the "Date of Issue/Release", which is the date of the new FFI backup file, and the "Content End Date", if you have collected new data this year that was added to the FFI database. Select **Edit Details** from the menu at the top of the profile to make these changes. If anything else has changed (e.g. new protocols established, old protocols abandoned, etc.), you can make these edits to the text fields (e.g. Abstract) as well. Once changes are complete, you must select the "Save and set to" **Active** button at the bottom of the window.
- 8) Finally, upload the new zipped FFI database backup file by selecting **Add Digital File** from the menu at the top of the reference profile (or Add Holding from the Holdings section). Click on **Select Files** and then browse to your zipped FFI database backup file to select it, and then select **Upload**. You must also add additional owners here who have permission to edit the holdings if necessary (we recommend at least one person besides yourself; I (MB) am happy to serve as an additional owner to assist with Data Store if you'd like, but not required!). Remember to Save as **Active** once you have completed any changes.
- 9) Repeat the above steps for each of your FFI databases.

Please feel free to contact MB if you have any questions at all about the process of updating the metadata and FFI databases on the Data Store. This is the first year of adding this aspect to our annual reporting process, therefore, we expect questions may arise about the Data Store, so don't be shy!

INSTRUCTIONS FOR UPLOADING 2013 ANNUAL REPORT TO SHAREPOINT

1. Save your report as a PDF file using the following file naming convention "2013 *Park/Network Name* Annual Report.pdf".
2. Go to the NPS Fire Ecology Sharepoint site (<http://famshare.inside.nps.gov/wildlandfire/firescience/fireecology/default.aspx>). In Fire Ecology Documents, upload your report to the 2013 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.