



National Park Service Fire Ecology Annual Report Calendar Year 2014

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



Prescribed fire at Rice Lake Flats, St. Croix Scenic Riverway.

A. Summary

The Great Lakes Fire Ecology Program underwent a few significant changes during the past year. In June, the FMO for the Border Waters Park Group transferred to a new position at OZAR. The FMO position will not be refilled and most of the duties for that position have fallen to the three remaining fire staff members. At this point, there are no plans to restructure to

program to provide additional support. Secondly, the Fire Ecologist started working halftime for the St. Croix Scenic Riverway. The Ecologist is still a fire funded employee but SACN is paying half his salary to fulfill the duties of their Terrestrial Biologist position. The Fire Effects Monitor position is still funded for seven pay periods and the program has been fortunate to have a returning employee in that position for the past three years.

Getting fire on the ground has been a struggle over the past several years due to a very small pool of nearby firefighters to assist with projects and no funding for non-WUI projects. We did manage to pull off five burns at SACN for a total of 170 acres. No wildfires of any significance occurred in the any of the Northern Parks.

The Ecologist finally published his report comparing dormant and growing season fires in red and white pine forests. The article was published in the October issue of Natural Areas Journal. Unfortunately, after this year, he can no longer claim the report as one of his accomplishments below.

The plot load was fairly light again this year but included some new installs within one of the newly expanded burn units at SACN. The fire VOYA fire crew assisted with plot sampling as well as the collection of fire scar samples for the VOYA fire history study. Approximately 50 additional fire scars were collected this field season, which when added to the current collection is enough to provide some clear insight into the fire regime at the park. The Ecologist is working with a researcher from the University of MN who is taking care of the analyses and will take the lead on any publications coming from the project.

Table 1. Fire Effects Plot Workload (2014) 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			4	4	34
	Mixedwood	FMH forest plot					13
	Jack Pine	FMH forest plot			1	1	12
Voyageurs	Red/White Pine	Herbs/woody stems *			6	6	77
	Mixedwood	Herbs/woody stems *			14	14	15
	Aspen/Birch	Herbs/woody stems *			4	4	8
	Sedge Meadow	Herbs/woody stems *			6	6	6
	Oak Savanna	Herbs/woody stems *					3
Voyageurs	Red/White Pine	Photo Points			4	4	12
	Jack Pine	Photo Points			1	1	1
	Mixedwood	Photo Points			6	6	6
	Oak Barrens	Photo Points			1	1	1
	Sedge Meadow	Photo Points			1	1	1
St. Croix NSR	Tallgrass Prairie	Herbs/woody stems *			9	9	26
	Glade	Invasive species					30
	Glade	Herbs/woody stems *					3
	Jack Pine Barrens	Herbs/woody stems *					13
	Pine/Oak Forest	Herbs/woody stems *	12			12	18
	Oak Savanna	Herbs/woody stems *					7
Total			12	0	57	69	286

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

Table 2. Fire Ecology Staffing 2014

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Scott Weyenberg	1/1/14	12/31/14	26*	No	ATV training, attended Forest and Water Resources conference and MW Invasive species conference.
Lisa Reatz	5/20/13	8/15/13	4	No	NPS required training

* Worked fulltime as Fire Ecologist through pp13 then worked halftime as Fire Ecologist and a halftime as Terrestrial Biologist for SACN. In 2014, 20 pay periods were paid by fire and six by SACN.

Table 3. 2014 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. See Southern area Annual Report for INDU analyses.

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. Published by Natural Areas Journal, 2014.	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.	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 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 93% Non-native grass 67% Native forbs.....7% Non-native forbs.....0%	Not yet	2014 (2004-2012)
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. Published in Natural Areas Journal, October 2014.

B. Program Information

Table 4. Planning - 2014

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 2014)	Assisted with how many BAER plans in 2014?
Voyageurs National Park	yes	2010	27	0
St. Croix NSR	Yes	No	10	0

Table 5. Monitoring - 2014

Park	% 2014 Data Entered	% 2014 Data Quality	# Prescribed Fires	# Non-fire Fuels Treatments	# Wildfires Monitored*	# BAER Treatments Monitored*
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		Checked	Monitored*	Monitored*		
Voyageurs National Park	100%	100%	4	0	1	0
St. Croix NSR	100%	100%	3	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 6. Communicating Results - 2014

Park	# of Project Monitoring Reports completed in 2014	# 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	1	0	0	

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

Table 7. Research - 2014

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2014	# of Proposals Funded in 2014	# of Research Projects Supported in 2014*	Additional Comments
Voyageurs National Park	yes	0	0	1	Fire history study being conducted with U of MN.
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.

C. 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 8. Fire Ecologist 2014 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	20	Burn plan revisions, developed FWS/NPS agreement to exchange funds for services, NFPORS, IAP's, GIS file updates for burn units, planning and implementing 5 burns at SACN.
Presentations	2	Meeting with St Croix Falls City Council, fire refresher.

NPS Meetings/ task groups	4	All employee meetings, collaboration workshop, ORV meeting (SACN)
Interagency work	8	Chairman of MNICS working group, Lake States Fire Consortium Advisory Committee member, MN Smoke Management Plan revisions.
Wildfire assignments		none
Prescribed fire projects	8	Line prep, FIRB trainee on one burn, implemented 5 burns at SACN
Non-fire fuels projects	5	INDU 1000 acre thinning project planning, TN Flats thinning project at SACN
Research	4	Manuscript revisions, Reviews of VOYA Terrestrial Synthesis and I & M vegetation report for SACN.
Data collection	12	Fire effects sampling at SACN & VOYA and fire scar sampling at VOYA
Data entry	1	GIS data management, misc data organizing.
Data analysis	15	INDU Fuels Summary, Sterling Prairie condition assessment (SACN), fuel moisture study (failed).
Supervision/Admin	15	Hiring, supervision, payroll, travel authorization/vouchers, purchasing, etc.
Training	2	ATV training, mandatory training, Invasive Species conference, Forest and Water Resources Workshop.
Travel out-of-park for plot or project work	4	Travelled to VOYA and INDU.
Miscellaneous	2	APIS ice caves detail.

D. Fire effects crew accomplishments and areas of focus

Table 9. Fire Effects Crew 2014 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	10	Estimated amount of time spent collecting plot data; includes any preparation time and travel time to local plot locations
WUI plots		
CBI plots		
Other plot work	30	Project Level Monitoring Fire Effects Plots and fire scar sampling.
Wildfire assignments	5	Assisted with two in-park wildfires.
Prescribed fire projects		
Non-fire fuels projects		
Travel out-of-park for plot or project work	5	Travel to SACN for sampling.
Data entry	30	Estimated amount of time spent entering data from paper to PC
Data analysis		
Supervision/Admin	10	Payroll, travel authorization/voucher, etc.
Training	10	Fire refresher and NPS mandatory training.
Miscellaneous		

E. 2015 Direction

The Border Lakes Fire Program is currently suffers from minimal funding and lack of guidance in the form of a concrete plan for the program in the wake of the FMO leaving. The three remaining staff members continue to fulfill most of the critical FMO duties.

There will be a concerted effort over the next few years to try and resurrect the prescribed fire program at VOYA. In the short term, this will take the form of burning small islands that can be done in house. If funds allow, larger mainland units may be attempted but currently this is not an option.

The prescribed fire program at SACN is stable and active. Per acre costs are high due to the fact that most of the personnel must be brought in from other parks. An agreement has recently been signed with the USFWS that will allow us to use more local resources and give us an avenue to pay them.

F. Optional Information

Attachments:

- *Vegetation dynamics after spring and summer fires in red and white pine stands at Voyageurs National Park.*
- *Sterling Prairie progress report.*

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_2014_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.

INSTRUCTIONS FOR UPLOADING 2014 ANNUAL REPORT TO DATA STORE

1. Save your report as a PDF file using the following file naming convention "2014 *Park/Network Name* Annual Report.pdf".
2. **NEW THIS YEAR!!!** We will now be uploading our annual reports to the IRMA Data Store instead of the Fire Ecology Sharepoint site. This change will allow us to have all of our Fire Ecology Program information stored in one reliable, accessible location. We are working with the I&M program to transfer all of our past annual reports from Sharepoint to the Data Store. Once this is done, you will be able to use the versioning feature of Data Store to clone the last annual report reference and update it with the current year's report (just as we are doing with the FFI databases). I will be sending out separate, detailed instructions for uploading the annual reports to the Data Store as soon as they are finalized.
3. Please e-mail your regional ecologist, MaryBeth Keifer, and Nate Benson to let us know when you get your report uploaded.

Call MaryBeth Keifer (603-795-2333) if you have any questions or problems.