



National Park Service
Fire Ecology Annual Report
Calendar Year 2011
Northern Great Lake Area Parks (VOYA, SACN, GRPO, ISRO, APIS)
 Fire Ecologist, Scott Weyenberg

A. Summary

Three burns were conducted this past year at St. Croix Scenic Riverway (SACN) for approximately 160 acres. The burns were conducted in tallgrass prairie and oak savanna. The fire ecologist served as a firing boss trainee on two of the burns. Two wildfires occurred within the Riverway boundary; both were small and quickly extinguished by the Wisconsin DNR.

On July 1st northwest WI experienced a significant windthrow event, which affected part of the Riverway. Approximately 300,000 acres of forest was affected from east-central Minnesota through northwest Wisconsin. Park Service Fire Management and the MN and WI DNR are making preparations for a potentially active spring fire season.

One burn was completed at Voyageurs National Park (VOYA) for six acres; limited funding precluded the implementation of other burns at the park. Voyageurs also managed a 300 acre wildfire from August through November.

The Upper Great Lakes program hired one fire effects monitor for 6 pay periods to assist with monitoring at VOYA and SACN. The Indiana Dunes (INDU) fire effects crew also assisted with monitoring at SACN in late August.

Table 1. Fire Effects Plot Workload (2011) 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			3	3	34
Voyageurs	Mixedwood	FMH forest plot			1	1	13
Voyageurs	Jack Pine	FMH forest plot					12
Voyageurs	Red/White Pine	Herbs/woody stems *					77
Voyageurs	Mixedwood	Herbs/woody stems *					15
Voyageurs	Aspen/Birch	Herbs/woody stems *					8
Voyageurs	Sedge Meadow	Herbs/woody stems *					6
Voyageurs	Oak Savanna	Herbs/woody stems *			3	3	3
Voyageurs	Red/White Pine	Photo Points					12

Voyageurs	Jack Pine	Photo Points					1
Voyageurs	Mixedwood	Photo Points					6
Voyageurs	Oak Barrens	Photo Points					1
Voyageurs	Sedge Meadow	Photo Points					1
St. Croix NSR	Tallgrass Prairie	Herbs/woody stems *	10		6	16	25
St. Croix NSR	Jack Pine Barrens	Herbs/woody stems *	10			10	10
St. Croix NSR	Pine/Oak Forest	Herbs/woody stems *	6			6	6
St. Croix NSR	Oak Savanna	Herbs/woody stems *			3	3	6
Total			26		16	42	236

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

Table 2. Fire Ecology Staffing 2011

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Scott Weyenberg	2004	-	26	No	FIRB training assignment, Synthesis of fire & oak workshop
Lisa Raetz	5/23/11	8/12/11	6	No	MOCC training.

Table 3. 2011 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	Prepare seedbeds, increase herbaceous layer diversity. 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
Mixedwood	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
Section 33	Monitored "fire use" fire.	See attached report.	NA	2011
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 2010 2010
Gagnon	Reduce brush cover by 50% Reduce duff depth.	12-58% reduction by 01yr03 (n = 4). 77% reduction (n=1)	Yes Yes	2010 2007

Burn or Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?	Year Last Analysis Completed
Mica Bay area (n = 3)	Maintain overstory current density $\pm 10\%$.	Basal area 170 -180 ft ² /ac. No change.	Yes	2010
	Decrease sapling density by 30%.	60 - 100% reduction.	Yes	2010
	Reduce litter & duff loading by 60 – 80%.	75 – 100% reduction.	Yes	2010
	Exposed mineral soil on >20% of site.	25% mineral soil exposure immediate post burn.	Yes	2010
	Reduce CW fuels 30-80%	1-100hr fuels +160%. 1000hr fuels +276%.	No	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
Mica Island & Squab Island	30-80% Reduction in fuels.	0-3" fuels: Mica: +46 to +176%, (n=6) (p=0.02). Squab: +38 to -115% (n=6) (p=0.19).	No – Mica Isl. No – Squab Isl.	2007
		3"+ fuels: Mica: +19 to -131% (n=6) (p = 0.19) Squab: -31 to -102% (n=6) (p = 0.01)	No – Mica Isl. Yes – Squab Isl.	2007
	Reduce ABBA density to <200 tpa (Mica Isl.).	ABBA density: 21 to 278 tpa. n=10 plots. (p = 0.24)	No – Mica Isl.	2010
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
	50-70% Reduction in 1-3" fuels.	1-3" fuels: 56% decrease to a 43% increase.	No	2004
	50-70% Mortality in pole sized balsam fir.	Pole sized ABBA: 39-100% mortality.	Yes	2004
	Regenerate white pine seedlings.	Seedling counts 5 years post: increased 27-400%, (decreases found on two sites).	Yes	2004
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
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
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
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

B. Fire ecologist accomplishments and areas of focus

Table 4. Fire Ecologist 2011 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	10	* Prescribed fire planning, compliance and implementation. * Revise burn plans. * Budget planning, NFPORS. * Meetings with MN DNR regarding blowdown and fire planning. * Review of LIBO FMP revision.
Presentations	3	* Webinar on underburning red pine - for Jan 2012. * Submitted Fire Stories for INDU, VOYA & SACN.
NPS Meetings/ task groups	<1	* INDU annual fire meeting (phone conference).
Interagency work	5	* MN Interagency Prescribed Fire Working Group meetings. * Advisory board member of Lake States Fire Science Consortium. * Oak barrens restoration tour/meeting, Superior Nat. For. * Meetings with IFT-DSS developers.
Wildfire assignments	1	* Tooth Lake Fire FFT1
Prescribed fire projects	7	* Line Prep. * FIRB Trainee. * Tool maintenance and purchasing.
Research	8	* Fuels succession proposal for JFSP, decided to submit in 2012. * NPS cooperator on VOYA fire history project submitted by U of MN. * Wrote letters of support for four proposals. * Continue to support IFT-DSS beta testing.
Data collection	14	* Sampling at VOYA and SACN.
Data entry	10	* Data entry for VOYA and SACN. * Data clean-up and management.
Data analysis	16	* Analysis and write-up for four technical reports. * Wrote two post burn reports.
Supervision/Admin	10	* Hiring, supervision, payroll, travel authorization/vouchers, purchasing.
Training	2	* Synthesis of fire and oak workshop. * Fire refresher. * FIRB training on SACN fires.
Travel out-of-park for plot or project work	1	* Travel to VOYA for sampling.
Miscellaneous	12	* Ecology program management: • Compiling GIS files. • Protocol updates. • File maintenance. • Sampling schedules.

C. Fire effects crewmember accomplishments and areas of focus

Table 5. Fire Effects Crewmember 2011 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	6	Four FMH plots
WUI plots	0	
CBI plots	0	
Other plot work	18	Project level sampling plots: point intercept, frequency frames, fixed & variable radius plots, photo points.
Wildfire assignments	0	
Prescribed fire projects	3	Line prep at Barkers Farm.
Non-fire fuels projects	0	None
Travel out-of-park for plot or project work	6	Travel to SACN for sampling and training.
Data entry	20	Finished leftover data checking from 2010 and other years past. Data entry for 2011.
Data analysis	10	Seedling age height relationship. Fire indices/duff moisture data compilation.
Supervision/Admin	5	Payroll, travel authorization/voucher, etc.
Training	15	MOCC training. General familiarization with the position.
Miscellaneous	17	Assistance with resource management projects. Fuel moisture sampling. General organization and filing. Plant ID book development.

D. Additional Program Information

Only parks with an active fire program are included. See Southern Great Lakes Annual Report for INDU, CUVA and LIBO.

Table 6. Planning - 2011

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 2011)	Assisted with how many BAER plans in 2011?
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 - 2011

Park	% 2011 Data Entered	% 2011 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Voyageurs National Park	80%	80%	4	0	0	0
Grand Portage NM	na	na	0	0	0	0
St. Croix NSR	80%	80%	6	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 - 2011

Park	# of Project Monitoring Reports completed in 2011	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Voyageurs National Park	3	0	0	No
Grand Portage NM	na	0	0	
St. Croix NSR	2	0	0	

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

Table 9. Research - 2011

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2011	# of Proposals Funded in 2011	# of Research Projects Supported in 2011*	Additional Comments
Voyageurs National Park	yes	1 See comment.	0	0	I am collaborating with researchers from the U of MN to complete an ongoing fire history project
Grand Portage NM	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.

E. 2012 Direction

The focus of the program for the next year will be to communicate the results via park presentations, research briefs and peer reviewed publications. The ecologist hopes to develop a programmatic burn plan for SACN and revise all their current plans. The fire program is working towards greater cooperation with the MN & WI DNR in terms of fire response at SACN.

F. Optional Information

VOYA

Year end money was used to pay for analysis of fire scar and tree core samples taken over the past six years. Samples were taken to the tree ring lab at the University of Minnesota. The money will not fully cover the analysis, however the researcher was very interested in using the samples to supplement a similar project he is involved with in the nearby Boundary Waters Canoe Area and will finish the work regardless. This has led to collaboration on a fire history research proposal submitted to the Joint Fire Science Program.

SACN

Several new units were sampled this year in anticipation of next year's burns. Some year end monitoring money was used fund a week long sampling visit by the INDU fire effects crew. There was not sufficient time to complete all the necessary sampling however. Travel costs and a short season for the Northern Great Lakes monitor means that this will likely be the norm at SACN and VOYA in the coming years.

Other

The ecologist is actively working with a researcher on a proposal to study fuels succession in prairies and oak savannas. The plan was to submit the proposal this year however; it was felt the study plan needed further development. We hope to submit the proposal in 2012.

This year the ecologist was asked to be a member of the Lakes States Fire Science Consortium advisory board. In mid-January, he will be co-presenting a webinar on under-burning in red pine forests sponsored by the consortium.

Having only one monitor that services the northern area parks will be a larger issue for 2012, since there are at least twice as many plots to read as in 2011. The single position greatly limits opportunities to perform field work since the monitor cannot go out alone and the ecologist cannot be with them all the time.

Regarding the attached reports, you will notice that I received some recent training in ordination specifically in using PC ORD. But that was in 2010, so it didn't make the report.

Attachments

Sec 33 Year 5 post report Final 3_31_11.doc

RPWP Spring Summer Comparison 3_31_11.doc

Mixedwood report Final 3_31_11.doc

INSTRUCTIONS FOR UPLOADING 2011 ANNUAL REPORT

1. Save your report as a PDF file using the following file naming convention "2011 *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 2011 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.