



**National Park Service
Fire Ecology Annual Report
Calendar Year 2006
Voyageurs National Park & Border Waters Parks
Scott Weyenberg, Fire Ecologist**

Summary

This annual report summarizes the activities of the Voyageurs Fire Ecologist, and fire effects program for the Border Waters parks. These parks include Voyageurs NP, Isle Royale NP (ISRO), Saint Croix NSR (SACN), Grand Portage NM (GRPO) and Apostle Islands NL (APIS). The fire ecologist also provides support for the Indiana Dunes fire effects program, which includes Indiana Dunes NL (INDU), Sleeping Bear Dunes NL (SLBE) and Lincoln Boyhood NM, and several other park units- Pictured Rocks NL (PIRO), Keweenaw NHP (KEWE).

Although the summer of 2006 was reasonably dry, fire activity in the parks was not especially high. Twelve fires were suppressed, 9 of which were at Voyageurs, 2 at Isle Royale and 1 at Apostle Islands. The largest fire grew to two acres. Two fires occurred in the fire use zone at VOYA but due to the high preparedness level, neither were managed as fire use.

Voyageurs welcomed their new FMO, Terry Severson. He comes to them from Neal Smith National Wildlife Refuge in central Iowa. Sweeping changes are already in the works with the 5 year review of the Voyageurs FMP. Plans are to expand the MMA to include islands as well as actively including them in their prescribed fire program.

The VOYA resource management staff and I continue to be active in the Border Lakes Group. This is a regional group of state/provincial (MN/Ontario), federal (USFS, Superior) and private (TNS, NCC) agencies dedicated to landscape level planning in the Border Lakes region. In that regard, we will share pertinent resource information among the agencies.

Various monitoring continues at VOYA. The 2004, Sec 33 fire use fire continues to be the highlight of the monitoring program. Plots were re-measured for the Year 2 post burn assessment. A considerable amount of change occurred over the last year; most notably there are at least three new hornet nests. The deer enclosure funded with 2005 year end money was

installed by the fire crew throughout the summer and monitoring plots were established in and around it. This will be helpful in determining effects of deer herbivory on pine regeneration and community structure. Additionally, data is being collected on stand age and fire history.

St. Croix NSR did not conduct any burns during the 2006 season. At least 4 burns are scheduled for 2007. Monitoring is ongoing and plot protocols continue to be honed.

Grand Portage, Isle Royale and Apostle Islands are currently working out the details regarding their fire programs.

Table 1. Fire Effects Plot Workload 2006

Park	Monitoring Unit	Type of Plot	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
Voyageurs	Red/White Pine	FMH forest plot	5		3	34
Voyageurs	Mixedwood	FMH forest plot			1	13
Voyageurs	Jack Pine	FMH forest plot	2			12
Voyageurs	Red/White Pine	Project Level	9		6	15
Voyageurs	Mixedwood	Project Level			15	15
Voyageurs	Aspen/Birch	Project Level			8	8
Voyageurs	Sedge Meadow	Project Level			6	6
Voyageurs	Red/White Pine	Photo Points		3		3
Voyageurs	Mixedwood	Photo Points			7	7
Voyageurs	Oak Barrens	Photo Points			1	1
Voyageurs	Sedge Meadow	Photo Points			1	1
St. Croix NSR	Hardwood Woodland	Project Level	3			3
St. Croix NSR	Tallgrass Prairie	Project Level	1			35
Totals			16 ^{VOYA} 4 ^{SACN}	3 ^{VOYA} 0 ^{SACN}	48 ^{VOYA} 0 ^{SACN}	115 ^{VOYA} 38 ^{SACN}

Table 2. Fire Ecology Staffing 2006

At Voyageurs, fire effects funding provides 13 pay periods at the GS-5 level for fire effect monitoring. The park uses this funding to add to the pay periods of the fire crew who conduct the monitoring. Each firefighter position is originally funded for 7 pay periods. The park thus obtains a larger monitoring field crew by supplementing the salaries of 2 GS-4 firefighters and 1 GS-5. One GS-4 firefighter position was cut from the budget in 2006. This table shows the pay periods funded by fire effects dollars as well as the number of pay periods they worked. Monitoring at Saint Croix is conducted by Robin Maercklein, Resource Management Specialist, and his resource staff.

Employee	Starting Date	Ending Date	# of Monitoring Funded Payperiods	Training and Development	# of Pay Periods Worked
Scott Weyenberg (GS11)	8/8/04	Permanent	26	Prescribed Fire... Management Conference, Vegetation Monitoring Training course, Fire Ecology Statistics Workshop, FEMO fire use detail.	26
Greg Carlson (GS5)	5/14/06	10/01/06	5.5	none	10
Travis Doeden (GS4)	5/14/06	8/23/06	5	none	7.25
Troy Anderson (GS4)	5/14/06	9/03/06	5	none	8

Table 3. Management Objectives and Monitoring Results 2006

Paired T-tests were used to determine if changes were significant across all plots and whether the objective was achieved. Monitoring results stated were analyzed by site. All results shown are within a 95% confidence interval of the mean.

Monitoring Unit	Management Objective (Restoration/Fuels reduction)	Monitoring Results (Analyzed by site)	Objective Achieved? ($p < 0.05$)
Red pine – White pine forest	60-90% Reduction in 0-1” fuels.	0-1” fuels - 67% reduction; to a 200% increase.	NO
	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
		($n=14$ plots, 8 fires)	

Fire ecologist accomplishments and area of focus

Much of my time this year was spent on finishing the Indiana Dunes monitoring plan as well as completing analyses for recent prescribed fires. I additionally completed an analysis of all ten years of monitoring for Mnoké prairie. Training was not a high priority this year, however I did attend a monitoring course put on by the TNC that was very useful.

Fire Ecologist Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas activities
General Planning	20%	- Researched and wrote the INDU FEMP; still in the review process. - Assisted in the five year review of the VOYA FMP; in process. - Compliance for stand age/fire history study. - Compliance for deer enclosure. - VOYA strategic planning for vegetation management. - Core Operations meeting. - Assisting with Fire Effects on Archeological Resources research project planning.
Presentations	<5%	Created poster for the regional FMO conference, Mnoké Prairie.
NPS Meetings/ Task Groups	<5%	Monitoring Plan working group.
Interagency Work	<1%	- Borderlakes Working Group annual meeting. - Collaboration with I & M network sampling protocols.
Fire Assignments and Fuels Projects	5%	- Detailed as a FEMO on one fire assignment. - Burned piles from mechanical thinning, VOYA. - Responded to three wildfires in and around Voyageurs N.P.
Research	<5%	Conducted sampling for fire history/stand age study.
Monitoring Field Work	10%	- Sampled FMH, project level and other plots at VOYA. - Constructed deer enclosure. - Field crew supervision.
Data Entry	5%	- Some of the VOYA FMH data was entered by the monitoring crew and all non-FMH data is entered by the fire ecologist. - All INDU and LIBO data entry is done by the INDU monitoring crew. - SACN monitoring data is currently being entered by the fire ecologist.
Data Management and Conversion	5%	- VOYA data management. - Try to set up FEAT replication. - SACN FEAT database development. - All INDU and LIBO data is managed by the INDU monitoring crew.
Data Analysis	30%	- INDU monitoring data was analyzed for Mnoké Prairie, Dune Ridge, Hobart Prairie Grove and the Oak Savanna monitoring type. - Continue the develop and adjust the protocols at VOYA, SACN & INDU.
Supervision/Admin	0%	- Hiring and supervision of the VOYA fire crew is done by the lead fire technician and the FMO. - Hiring and supervision of the INDU monitoring crew is done by the lead monitor.
Training & Professional Development	10%	- Vegetation Monitoring in a Management Context (TNC). - Conference - Prescribed Fire: Igniting the Possibilities for Land Management. - Fire Ecology Statistics Workshop. 1st aid & Blood Borne Pathogen training. - Fire refresher.
Park Visits	<5%	Visit to SACN to set up monitoring program.
Miscellaneous	10%	- Fire Program Readiness Review. - Program budget review. - Weather station set-up and tear down. - Assist with resource management projects.

Fire effects crew accomplishments and area of focus.

The fire crew spent approximately 15% of their time measuring plots and entering data. Another 25% of the time was spent on fire assignments and 20% on constructing a deer enclosure. Except for CPR and 1st Aid no time was spent on training and career development. The remainder of the time was spent on other fire-related tasks. Approximately 40 person days were spent by the crew (excluding the fire ecologist) conducting plot work and data entry. This equates to approximately 26% of the fire effects funding being used directly for this effort (40 out of a total of 155 person days funded by monitoring dollars).

Table 5. Fire Effect Crew Accomplishments

Category	Percent Time	Notes
FMH plots	10%	Re-measured 11 forest plots (24 shifts).
Project Level plots	1%	One crewmember assisted with the Sec. 33 post burn read (3 shifts).
Other plot work and related projects	20%	 One crew member assisted in collecting vegetation data for the deer enclosure (3 shifts).  Constructed deer enclosure (50 shifts).
Fire Assignments and Fuels Projects	25%	 Crew responded to 9 wildfires in the park (VOYA) (~ 30 shifts)  Three crewmembers participated in a 2 week engine detail (30 shifts).
Data Entry	5%	Completed ~ half the data entry for the 2006 FMH reads (10 shifts).
Data Management and Conversion	0%	Not part of crews assigned duties.
Data Analysis	0%	Not part of crews assigned duties.
Supervision/Admin	0%	Not part of crews assigned duties.
Training & Professional Development	2%	Each crew member had refresher training.  CPR, 1 st aid & Blood Borne Pathogen training (6 shifts).
Miscellaneous	37%	Crew members participated in in-house fire related duties as assigned.

Optional VOYA

Data entry at VOYA continues to be a problem. Last season just over half the data entered was lost due to problems with replication. This year less than half the data were entered, due to the replication problem never being resolved. At the last minute I resorted to making a copy of the database onto which the crew entered the data. Although not ideal it worked. Currently, most of the fifteen years of data have not been quality checked. This will be a challenge to complete prior to the advent of FFI.

At VOYA, new protocols will be established in 2007 to monitor brush density, as an aggressive approach will be taken over the next five years to restore many pine stands that are inundated with brush.

SACN

Although no prescribed fires took place at St. Croix NSR in 2006, the fire program has support and is actively establishing new burn units. The monitoring program established is focusing on

project level monitoring. Some changes were made to the methods in 2006. Nested frequency plots were originally used in the prairies for various reasons, however it was determined that the detectable change of 7% was not acceptable. Additionally, uncommon plants were still not being adequately sampled and cover of the more common plants was needed not just presence/absence. Traditional FMH grass plots with the addition of 1x1m subplots and a timed search are now being used. Percent cover, frequency and diversity can be obtained from this. Trees are sampled in subplots in variable and fixed radius plots and are not tagged.