



**National Park Service
Fire Ecology Annual Report
Calendar Year 2011
SOUTHERN GREAT LAKES AREA (INDU, LIBO, SLBE & CUVA)
Lead Monitor, Mary Fisher-Dunham (INDU)
Fire Ecologist, Scott Weyenberg**



A. Summary

This was the 14th year of the fire effects program at Indiana Dunes National Lakeshore (INDU). This year's staff included one permanent and three seasonal positions. The crew is responsible for the monitoring at INDU and two other parks: Lincoln Boyhood National Memorial (LIBO) and Sleeping Bear Dunes National Lakeshore (SLBE). With a fire program soon to be initiated at Cuyahoga Valley National Park (CUVA), the fire effects program will be adding this park to its monitoring responsibilities.

At INDU, 10 prescribed burns were completed; six in the spring and four in the fall. No burns were completed at LIBO and CUVA. Piles were burned at SLBE.

In late August, the INDU staff visited St. Croix National Scenic Riverway (SACN) to assist with sampling of four burn units. The crew's arrival unexpectedly coincided with the birth of the Ecologist's first child! Fortunately, park employees were able to assist the crew with directions and boat transportation.

Table 1. Fire Effects Plot Workload (2011) ** and Total Plots Installed

Park	Monitoring Unit	Plot Type (FMH Brush plot, photo point, CBI, etc.)	Pre-burn 2011	Immed. Post 2011	Postburn (1-20 yrs) 2011	Annual Total (2011)	Total Plots
Indiana Dunes	Prairie	FMH Grass plot	0	2	8	10	28
Indiana Dunes	Oak Savanna	FMH Forest plot	3	3	8	14	19
Indiana Dunes	Oak Woodland	FMH forest plot	1	1	13	15	22
Indiana Dunes	Oak Forest	FMH forest plot	0	0	0	0	1
Indiana Dunes	Pr/Sav/Wood/Complex (Howes Pr.)	Other - USGS	0	0	31	31	31
Indiana Dunes	Sav/Wood/Forest	Other - NPS	0	4	25	29	96
Indiana Dunes	Sav/Wood/Forest/Wetlands	Photo	0	0	15	15	20
Indiana Dunes	Oak Savanna Mech. Thinning *	Fuels and Photo; Pilot study plots: cut vs. no cut	6	6	6	18	6
Cuyahoga Valley	TBD/old field recreation	NA	-	-	-	-	-
Cuyahoga Valley	TBD/rare plants?	NA	-	-	-	-	-
Cuyahoga Valley	TBD/?	NA	-	-	-	-	-
Sleeping Bear	Old Field	Photo	0	0	0	0	7
Sleeping Bear	Jack Pine	Photo	0	0	0	0	2
Lincoln Boyhood	Oak - Hickory	Other - USGS	0	0	0	0	8
Total			10	16	106	132	240

* Pilot sampling plots

**Note: Assisted with monitoring of 4 units at SACN: 3 units with plot reads, 1 unit with canopy gap light photo baseline. See Northern Great Lakes Area report for details.

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	1/1/11	12/31/11	26		See Northern Great Lakes Area report.
Mary Fisher-Dunham	1/17/11 3/14/11	2//11/11 12/16/11	21	No, interested	Eastern Oak Fire conference, Botany, ARCGIS for Emergency Managers, HazMat.
Megan Korte	5/23/11	9/30/11	9	No	Botany, AD fall 2011, FEMO task book opened.
Jillian Post	5/23/11	9/30/11	9	No	Botany.
Mike Rotter	5/23/11	8/26/11	7	Yes	Botany.

Table 3. 2011 Management Objectives and Monitoring Results

Fuel reduction objectives/results are mean percent reduction from pre-burn to immediate post-burn.

Burn or Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?	Year Last Analysis Completed
Dune Ridge (Oak Woodland) (n=25) (year 2 data)	Reduce overstory basal area.	5-15cm class: -48% (p=0.0001). 15-30cm class: -14% (p=0.005). >30cm class: no change.	Yes	2009
	Reduce understory woody stem density.	0-1cm class: +218% (p = 0.039) 1-2.5cm class: -70% (p = 0.0001) 2.5-5cm class: -96% (p = 0.0001)	Yes but is v. temporary	2009
Cowles Dunes (Oak Woodland) (n = 2) (5 year time span 3 reads)	Reduce overstory basal area.	Pre BA=77ft ² /ac. Post 87ft ² /ac.	No	2009
	Increase species diversity.	10 to 60% increase.	Yes	2009
Inland Marsh 5 (Oak Savanna) (n = 1) (10 year time span, 6 reads)	Reduce overstory canopy closure/basal area.	Closure slightly reduced and poles reduced significantly.	Yes.	2009
	Reduce shrub cover.	Shrub cover increased from 40 to 60%.	No.	2009
	Increase % cover of C ⁴ grasses	Grass cover remains stable.	No.	2009
Kintzele Ditch (Oak Forest) (n = 4) (9 year time span, 6 reads)	Reduce overstory canopy closure/basal area.	Closure unchanged, BA reduced in one size class due to wind throw.	No	2009
	Reduce understory stem density.	Stems less than 2' reduced. Overall woody cover increased after windthrow.	No	2009
	Reduce woody fuels	1-100 hour fuels: ~100% increase. 1000 hour fuels: ~100% increase.	No	2009

Burn or Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?	Year Last Analysis Completed
Mnoké Pr. (Tallgrass pr.) (n = 20) (multi-year analysis)	Increase in cover of seeded species.	ANOVA comparison test (p = 0.7 and 0.9) (n: 3 sets of 5 plots).	No	2010
	Increase cover of native forbs & grasses.	Native forb: +15% (p = 0.0007) Native grass: +5% (p = 0.05)	Yes	2005
	Decrease cover of non-native forbs & grasses.	Non-native forb: -43% (p = 0.01) Non-native grass: -12% (p = 0.0001)	Yes	2005
	Increase floristic quality index.	Pre (1995)= 40; 2006 = 52.	Yes	2006
Hobart Prairie Grove (Oak woodland) (year 1 data)	Reduce woody stem density by thinning and fire.	Thinning: 0-2" class: -22% to -71% (p = 0.15) (n=3). Fire: 0-2" class: -36% (p = 0.009) (n = 3).	Yes Yes	2007 2007
	Reduce woody fuel loading.	1000 hour: 16% (n = 7) 1-100 hour: -1% (n=13)	No No	
Oak Savanna (n = 7 burn units) (multi-year)	Reduce woody fuels.	1000 hour: No change (p > 0.05). 1-100 hour: No change (p > 0.05).	No No	2005

*Results are greatly simplified for this report.

B. Fire ecologist accomplishments and areas of focus

See Northern Great Lakes Area Annual Report

C. Fire effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew 2011 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	23%	FHM plot sampling.
Other-USGS plots	11%	Howes Prairie and Lupine Lane sampling.
Other-NPS plots	13%	Project Level sampling at INDU. Assisted with sampling at St. Croix. Prep for anticipated sampling at SACN & LIBO.
Other plot work	1%	Pilot study: fuel treatment plots,
Wildfire assignments	1%	4 th July Step up.
Prescribed fire projects	4%	FEMO on 12 units, FFT2 on 4 units.
Travel out-of-park for plot or project work	1%	To St. Croix in late August and Missouri in spring.
Data entry	9%	In addition to this year's sampling data, we entered data into the LIBO database. All LIBO data had not been entered as we were awaiting conversion of database.
Data Management	2%	Management of data entry and data storage
Data analysis	2%	Prepared analysis for immediate post burn reports and queried raw data for review of Conservatism Values of FMH plots.
Supervision/Admin	7%	Leads time calculated as percentage of the total of both the crew's and Lead's hours.

		Time spent in recruitment, hiring process and selection, supervision, training and performance evaluations.
Reports	5%	Prescribed fire reports, Immediate Post Burn Assessment Reports, Annual Park report, Annual FE report,
Training	9%	Botany training, safety training, mandatory NPS training and mandatory seasonal INDU orientation (three days). Includes Lead's physical training, emergency management training with ARCGIS, hazmat training and Eastern Oak Conference.
Miscellaneous	6%	Planning and working with others (fire ecologist, USGS researcher), grant proposal work, submissions for Rx Newsletter and "Fire Story".
	6%	Time troubleshooting computer problems, organization, responding to data or information requests and assisting with office moves.

D Additional Program Information

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?
Indiana Dunes	No	2009	11	0
Sleeping Bear Dunes	No	NA	NA	NA
Cuyahoga Valley	No	NA	NA	NA
Lincoln Boyhood	Yes	2003	0	NA

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**
INDU	100%	100%	25	1***	0	0
CUVA	NA	NA	0	0	0	0
LIBO	NA for 2011 data, However, 100% of data from inception completed	NA	0	0	0	0
SLBE	NA	NA	0	0	0	0

* In addition assisted with monitoring of 4 units at SACN: 3 units with plot reads, 1 unit with canopy gap photos.

** Number of treatment units with treatment effects monitoring conducted. Include pre-burn and post-burn monitoring but not burn-day monitoring.

*** Pilot mechanical thinning 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?*
Indiana Dunes	0	2	0	No
Lincoln Boyhood	0	0	0	
Cuyahoga Valley	NA	0	0	
Sleeping Bear Dunes	NA	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
Indiana Dunes	yes	1	0	0	
Lincoln Boyhood	yes	0	0	0	
Sleeping Bear Dunes	yes	0	0	0	
Cuyahoga Valley	NA	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

Communications

- Work on communication with INDU resource management (RM) staff to define goals and objectives for the burn units. This will help us to refine our data collection efforts.
- Discuss ways where fire monitoring data can be made more useful to RM needs.
- Encourage greater cooperation between RM and the Fire Program to achieve greater impact on restoration projects.
- Continue to support RM on fire related research projects. We are currently assisting with the following projects: Karner Blue butterfly habitat restoration using mechanical thinning, the efficacy of fire in wetland restoration and invasive plant interactions with fire.
- Support participation of fire staff (captains and burn bosses) in the spring and fall fire planning meetings.
- Establish an annual fire ecology meeting attended by Fire and RM staff.
- Develop relationships with CUVA, LIBO and SLBE staff.
- At LIBO, coordinate with the EPMT for greater effectiveness of fire and chemical treatments.

Fire Effect Program

- Continue to evaluate the monitoring program to determine priorities in light of pending budget cuts.
- Use our data to review the current fire intervals.
- Request more site visits to INDU by the ecologist and look for opportunities where the Lead can accompany him to our partner parks.
- Support sampling at other parks, i.e. SACN & VOYA, if schedule and budgets allow.

Staff Development

- Continue botany training, a proven method to increase sampling efficiency.
- Recruit returning staff and highly qualified applicants with strong botany skills. Hopefully the word is spreading that this is a well run fire effects program.

F. Optional Information

FFI

To date, FFI has been my friend. There are occasional glitches, but the database works well and the changes have been helpful. However, I would like to be able to perform searches to determine all occurrences of a specific species within the database.

With regard to PDA's, we would be interested in a webinar on the pros and cons of these devices, how to use them, which brands work best, etc.

PROGRAM INFORMATION

The Fire Effects crew had a busy summer reading plots in our home park, and traveling outside the park to sample at St. Croix National Scenic Riverway (SACN).

Staffing: This year's field crew was enhanced by having a detailer fill one of the crew positions. This proved to be a good experience for both as we learned from each other. He mentioned that he would be taking some INDU ideas back his home park. In addition, we enjoyed the return of two seasonal crew members. Our student hire from last year returned this year as a competitive hire. And a returning seasonal, from several years filled out our team of three. Having good returning crew reduces training needs and increases efficiency.

Training: Once again several successful approaches were continued this year. The Lead continued with starting the crewmembers on the same date for a more efficient training period. Training consisted of reviewing custom and FMH protocols as well as sampling and data entry exercises. The FFI database instructions were refined and continue to be a useful reference for the crew.





For the third year, a week-long botany training focusing on sight identification by vegetative characteristics was continued through a contract with the Institute of Botanical Training. The botany training continues to increase efficiency in the field. Training with RM personnel provides an opportunity to form relationships with other team members in the park; something that is hard to achieve during the busy summer season.

The Lead initiated an after hour's botany group, which met most Tuesday evenings after work. Various sites both in and out of park were visited. Fire effects and wetland crew members were the most consistent participants, but we had participation from other seasonal staff. The hope is to continue the group and help grow the park's field taxonomical capacity.

INDU: The six burns scheduled for the spring were completed. Four units were burned in the fall, half of which were alternative units. The scheduled wetland site, which appeared to be receptive to fire in the early fall, later received too much precipitation to burn. This led to some discussion as to whether such wetland sites need to be burned outside the 'typical' fall and spring burn season.



The Lead participated in all prescribed burns as either a FEMO or crewmember. She also supervised two FEMO trainees and wrote or contributed to the final fire reports. The Lead also drafts the fire effects post-burn severity assessment report.



Clean-up the INDU database was completed, including the revisions to the species list. We continue to be vigilant and make refinements. As time permitted, the crew worked at conducting raw data queries to look at the average “Conservatism Value” of each of our plots. With the help of our detailer’s taxonomical expertise, we began a crosswalk for each species’ specific epithet to bring our species list up to date with new taxonomy. We continue to use *Plants of the Chicago Region* for our coding and nomenclature, but will crosswalk nomenclature with the USDA plant database as the primary source for new taxonomy. *Flora of America* nomenclature will also be reviewed.

This spring, pre- and post-burn pilot sampling was conducted for a thinning project. The sampling was a joint effort between Fire Effects and Noel Pavlovic, a USGS Ecologist. Preliminary data has been analyzed and a report will be finalized soon.



The Lead helped briefly with sampling for a study on the effects of deer browse on lupine. The project is a collaborative effort between the USGS and RM staff. This was a good cross training experience as the Lead learned field observation signs of different herbivore browse. On her own time, the Lead also assisted the park’s wetland staff with planting and soil sampling for a restoration project.

The Lead continues to work toward collaboration with others. This past November, a proposal entitled, “Managing fuels and fire in restoring Midwestern Oak Savannas” was submitted to the Fire & Fuels Reserved Fund, by USGS plant ecologist, Noel Pavlovic (lead investigator), with the Lead Monitor serving as the NPS project cooperator.

Our Fire Effects data was solicited by the Assistant Chief of Resources to assist with the Watershed and Natural Resource Condition Assessment. We are pleased to be able to provide the information. The final report will summarize resource conditions and problems, and will make recommendations for further actions.

One of the highlights of this year was finding Blue Hearts, *Buchnera americana*, in Howe's Prairie. Blue Hearts had not been seen in Howe's Prairie since the late 1990s. *Plants of the Chicago Region* states it is "one of our very rarest plants" This rediscovery will be included in the new version of the *Special Vegetation of Indiana Dunes National Lakeshore*.



Seasonal team member Jill Post's photograph of a Karner Blue Butterfly won the Rx Newsletter Photo Contest: See Rx Effects - Volume 1, Issue 10 - Fall 2011 Photo Contest: http://www.nps.gov/fire/fire/fir_eco_rxeffectsnews.cfm

SLBE: The Burfiend Field unit, scheduled to be burned last spring, was delayed due to continued community opposition. Pile burning did occur however, and 47 burn piles near the Platte River Campground were burned. Additional piles located in near Point Oneida are to be burned this winter. Recommendations and planning are still being finalized for the Platte River Campground burn unit. At this time, the goals only include fuel reduction. Therefore, only fuel sampling will be done. Also of note, a wildfire was managed on South Manitou Island. The fire burned approximately 1/10 of an acre in thick duff. The fire occurred in an old growth sugar maple forest.

LIBO: Three new burn units were created this past year and all were scheduled to be burned along with the original Cemetery Hill Unit. However, due to weather issues, the burns did not occur. Fire effects monitoring for the newly added burn units will be conducted on several preexisting USGS research plots. The plots will be re-sampling but not all protocols will be implemented however.



Last year, it was decided that the LIBO fire effects data should be entered into FFI rather than wait for the conversion of the old Access database. The Fire Ecologist developed FFI database datasheets and the crew completed the entry of all Fire Effects sampling data by the end of the season. This has been a significant accomplishment. The older plot data from USGS sampling stills needs to be entered.

CUVA: Three burn units are designated in the park: Borrow Pit, Terra Visa and Coliseum. The Borrow Pit burn unit and burn piles in the Terra Visa unit were tentatively scheduled to burn this fall but the burns could not be completed since the FMP and other details have not been finalized. Goals for the burn units will be discussed among the FMO, CUVA staff and the Fire Ecologist. The Fire Ecologist will determine what monitoring is needed based on these goals.

Other Parks – SACN: In the past, there was discussion around having the INDU Fire Effects crew assist with sampling at the other parks being served by the Fire Ecologist. Normally, the heavy work load at INDU as well as travel constraints precludes that. This year's schedule was light and there was money left over in the VOYA monitoring budget. This allowed the Lead and two seasonal to travel to St. Croix. The crew spent one glorious week identifying plants, going on boat rides and swatting mosquitoes. The crew also reviewed the species lists and added annotations to help future sampling crews with plant identification.



Being able to assist other programs is a positive experience, giving us the opportunity to work directly with the ecologist, cross train in another park's protocols and experience different ecosystem and parks. The INDU fire effects team was pleased to be able to assist the wider program in this manner.



Summary of contribution outside “normal assignments” by INDU Fire Effects

- Provided data for the Condition Assessment report.
- Assisted in the Lupine/Deer browse study.
- Hosted Botany training for RM staff.
- Developed a well accepted recruitment flyer.
- Initiated an after work botany group.
- Assisted SACN with sampling and enhanced their species list.
- Assisted with Reserve Fund research proposal.
- Conducted joint pilot sampling project with USGS.