



National Park Service Big Cypress National Preserve Fire Ecology Annual Report Calendar Year 2016

Jill Waisley

A. Summary

The Fire Effects crew at Big Cypress National Preserve (BICY) completed a wide variety of fuels and non-fuels related projects in the 2016 calendar year. Accomplishments include:

- Implementation of 14 prescribed fire treatments for 33,000 acres (ac).
- Participation in 17 wildfires totaling 9,400ac.
- Cleared 130 Red cockaded woodpecker (RCW) trees.
- Treatment around and protection of 50 privately owned properties.
- Visit 14 pine severity assessment plots within the Mud Lake Complex area to examine pine mortality 1.5 years post burn.
- Although potential funding in FY17 has been put on hold until December 2016, a \$10,500 grant proposal has been submitted through the US Fish and Wildlife Service Aquatic Habitat Restoration/Enhancement program to reduce woody shrub encroachment into wet prairies with fire treatments. A proposal has also been submitted for FY18 funding.
- Acquisition of \$20,000 in grant funding for prescribed fire operations within BICY from the National Wildland Turkey Federation.

Throughout the year, the prescribed fire crew worked extensively with Resource Management staff, cooperators, and university researchers on multiple projects. Rx staff provided ground support, logistical coordination, and geospatial data to:

- Resource management staff to target high priority burn areas for the benefit of the endangered Florida panther, threatened Big Cypress fox squirrel and Red cockaded woodpecker.
- Fire Effects Crew participated in six outreach activities with school children to explain the importance of fire in South Florida.

- Interpretation staff to execute the Big Cypress Swamp Heritage Festival. Many fire personnel assumed lead roles for this event.
- Function in lead roles for the BICY Hurricane Preparedness Team and assist in the execution of the Preserve shut down during Hurricane Matthew.

Table 1. Fire Effects Plot Workload (2016) and Total Plots Installed

Park	Monitoring Unit	Type of Plot	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Annual Total Plot Visits in 2016	Total Plots
			2016	2016	2016		
Big Cypress	Pine	Photo point	2 (1 new photopoint installed)	5	11	18	35
Big Cypress	Prairie	Photo point	1	9	11	21	25
Big Cypress	Cypress Savannah	Photo point	0	2	5	7	8
Big Cypress	Mud Lake Wx Area	Pine Severity Assessment	0	0	14	14	14
Total Plots			3	16	41	60	82

Table 2. Fire Ecology Staffing 2015

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Jill Waisley (Fire Ecologist)	1/1/16	12/31/16	26	No	RxB2 (t) on 2 prescribed burns for 17,600 acres and graduated with a Master Certificate in Ecological Restoration through University of Florida
Megan Hurrell (Lead Fire Effects Monitor)	1/20/16	12/31/16	26	No	Worked as a FEMO(t), ENGB(t), HGMB(t)
Trevor Williams (Seasonal Monitor)	1/1/16 10/17/16	4/16/16 12/31/16	8 6	No	Initiated: HECM, FFT1/ICT5, and FEMO taskbooks
Fletcher Yancey (Seasonal Monitor)	1/1/16	4/16/16	8	No	Initiated: FFT1/ICT5, HECM, and FEMO taskbooks
Jarred Finn (Seasonal Monitor)	10/17/16	12/31/16	6	No	Initiated: FEMO taskbook Continued working on FFT1/ICT5 taskbook
Jeanine Dole (Seasonal Monitor)	10/17/16	12/31/2016	6	No	HECM course Initiated: FFT1/ICT5, FEMO and HECM taskbooks

Treatment objectives are calculated using GIS based on fire history data and most current vegetation layer. Fuel reduction height results are based on ocular estimates collected during site visits. Fuel reduction objectives/results are percent reduction from pre-burn to immediate post-burn.

Monitoring Unit	Management Objective (Restoration)	Monitoring Results	Objective Achieved ?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
Pine	Treat >70% of pinelands in BICY at least once within 7 years	Fuel reduction treatments for the last 7 years occurred in ~66% of pinelands in BICY at least once <i>- 63,374 acres of pinelands treated (305 fires) within last 7 years, (95,964 total acres of pinelands throughout BICY)*</i>	NO	2016 (2010-2016)
	Reduce woody shrub height >50% one year post burn (when compared to pre-treatment) in pinelands	Ocular Estimation at photopoint sites determined that >50% reduction in shrub height occurred 1 year post at 67% of the plots. <i>(n=8 plots visited one-year post treatment, 5 fires in pine plots)</i>	YES	2016 (2015)
Prairie	Treat >70% of prairies in BICY at least once within 7 years.	Fuel reduction treatments for the last 7 years impacted ~53% of prairies in BICY at least once <i>35,673 acres of prairies treated (305 fires) within last 7 years, (66,757 total acres of prairie throughout BICY)*</i>	NO	2016 (2010-2016)
	Reduce woody shrub height >50% one year post burn (when compared to pre-treatment) in prairies	Ocular Estimation at photopoint sites indicate that >50% reduction in shrub height occurred 1 year post at 80% of the plots <i>(n=5 plots visited, 4 fires in prairie plots where woody shrubs are within 100ft of plot center)***</i>	YES	2016 (2015)
	Top-kill at least >75% of fine fuels and woody shrubs during each treatment	>75% total fuel reduction occurred at 100% of permanent monitoring plots. <i>(n=8 plots visited with woody shrubs present before treatment, 75% of plots had >75% fuel reduction immediately post treatment)</i>	YES	2016 (2016)

* Total Acres were calculated using the Rx 2010 feature class values of the BICY Vegetation Layer in ArcGIS 10.1. This feature class includes the most recent vegetation layer updates.

** Ocular estimates were used to explore pre- versus post-burn woody shrub reductions. A photoseries project to accurately display fuel loading would improve consistency of estimates.

B. Program Information

Table 4. Planning - 2016

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 2016)	Assisted with how many BAER plans in 2016?
Big Cypress National Preserve	Yes	2013	0	1

Table 5. Monitoring - 2016

Park	% 2016 Data Entered	% 2016 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored **	# BAER Treatments Monitored*
Big Cypress National Preserve	90%*	90%*	3	0	5	0

* Monitoring report was submitted early and an additional 6 photopoints are scheduled for visitation between Dec. 1st and Dec 31st.

**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 - 2016

Park	# of Project Monitoring Reports completed in 2016	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Big Cypress National Preserve	1	4	3	No*

* Familiar with Minitab and plan to use in the future.

Table 7. Research – 2016

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2016	# of Proposals Funded in 2016	# of Research Projects Supported in 2016*	Additional Comments
Big Cypress National Preserve	Yes*	0	0	3	RCW monitoring, Florida panther research, Bonneted bat research project

* Additional research needs are being considered and will be included in the next Monitoring Plan update.

C. Fire ecologist accomplishments and areas of focus

Fire ecologist was hired in July. Fire effects monitoring accomplishments could not be achieved without dedication of the hard-working Fire Effects Lead and crewmembers and this year all percentages are inclusive of all staff members.

Table 8. 2016 Fire Ecologist and Fire Effects Crew Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Off Unit Assignments	28%	- 10 off unit assignments - Positions held during off unit assignments include: FFT1/ICT5, FEMO, HECM, ENGB (t) SEMG and HMGB.
Prescribed Burning planning and prep	20%	- Planning, conducting or participation in 14 Rx treatments in BICY and additional fire treatments with cooperators totaling over 50,000 ac - Scouting areas, examine fuel loads and on-site observations for expected fire behavior. - Coordinated personnel, equipment and additional resources needs with neighboring units. - Acquired agency approval - Prepared and treated along firelines, RCW trees and structures - Completed large scale Rx treatments
Training/School	12%	- Training includes : - Completion of 12 graduate level credits leading to a Masters Certificate in Ecological Restoration through the University of Florida - BICY Fire Refresher - BICY symposium and Tuscon Ecology Conference - Plant Identification Training with neighboring organization - S-219 - S-230 - M3 - S-312 - A multitude of aviation courses
Data collection	9%	- Including planning for/travel to and from - Photopoints - Fuel samples - RAWs station maintenance
Data Entry	10%	- Entering field data into database for photopoints, pine severity and photo series projects. - RAWs
Admin/Supervisory/Misc	10%	- Hiring, supervision, payroll, travel authorization/vouchers, purchasing, - Weekly staff meetings - Daily PT and vehicle PM's - Misc. tasks - vehicles to town for repairs, FOC upkeep etc
Data analysis	3%	- Basic photo plot data - Initial assessment of pine severity data - Time management analysis
Interagency/Cooperators/Outreach	5%	- Working to update the National structure assessment database. - National Wild Turkey Federation - Aquatic Habitat Restoration/Enhancement Project funding - Participated in seven outreach activities with schools and school children -participated in Make-a-Wish program
Wildfire Response (in BICY)	3%	-Held leadership or trainee positions on ~17 wildfires totaling ~10,000ac

D. Fire effects crew accomplishments and areas of focus

Table 9. Fire Effects Crew 2015 Accomplishments/Focus Areas

This only includes Fire Effects Crew.

Category	Percent Time	Notes
WUI photopoints	2%	17 WUI photopoints visited
Photopoints	3%	35 non-WUI photopoints visited
Other plot work	8%	14 wildland fire pine severity plots
Wildfire assignments	35%	3 month fire assignment to work on HGMB(t) Other training fire assignments by Fire Effects Staff include FFT1(t), ENGB(t), and FEMO(t)
Wildfire Response (in BICY)	3%	Response to 11 wildfires within BICY
Prescribed fire projects	23%	Participation in 14 prescribed fire projects. Includes planning, prep, and holding qualified leadership or trainee positions.
Data entry	7%	Estimated amount of time spent entering data from paper to PC
Data analysis	1%	Minimal analysis of photopoints to evaluate fuels treatments
Supervision/Admin	2%	Payroll, travel authorization/voucher, etc.
Training	5%	Seasonal refreshers, S-131, HGMB,
Miscellaneous /outreach/Research Cooperation	11%	8 outreach activities, 2 research cooperation activities with neighboring agencies and other misc projects
Miscellaneous	5%	Things that don't fit in other categories

E. 2016 Direction

In the future the BICY Fire Effects program will work to convert all monitoring data from Excel into FFI for easier sharing and utilize Minitab for data analysis. Additional projects will be undertaken to improve our data assessment procedures. This is a work in progress and will likely take several years to complete and the information will be included in the updated Fire Effects and Monitoring Plan.

F. Overall Data Entry Status and FFI suggestions

Program Data -

- 2% of **total** monitoring program data (including past and present data) entered into FFI.
- 90% of **total** monitoring program data (including past and present data) entered into Excel. (Completion of five photopoints is expected between the time this report is submitted and the end of year).
- 90% of data has been quality checked and hard copies of photographs and collected data is accessible in a fire proof safe within the building.
- Yes, there is a need for migration of about 4,000 cells from Excel into FFI. Data includes photographs and basic site visit data.

FFI Feedback – May be helpful to include a crosswalk between FFI and the other programs that were used to create it. For example, a list of each protocol with guidance on which guide book (Firemon or something else) was followed to help create the FFI protocol. This will help when questions arise about creating a new procedure we don't have to guess which guidebook will provide the greatest amount of help.

Example datasheets for each protocol would also be helpful specifically for programs that are looking to improve/change existing protocols. For example, if I begin using a protocol that was originally developed in Firemon but the data that goes into FFI isn't set up in the same format it would be great to have a suggested worksheet that could be printed and matched FFI. Many of these differences are slight, but it could make data entry faster and improve efficiency.

G. Optional Information

The BICY Fire Effects Crew has examined repeated fire cycles within Big Cypress NP, and the initial assessments indicate that when fire treatments are repeated on a 1-7 year fire return interval and top kill at least 75% of shrubs and herbaceous material during each treatment, as assessed immediately post, the current vegetation types are successfully maintained in prairie and pinelands. However, shorter FRI intervals (<3 to 4 years) are optimal in pinelands where open under story is essential for threatened and endangered species foraging (i.e. Red cockaded woodpecker) or in prairies that provide essential deer browse.

The panoramic photo (below) is an example of one plot that has maintained an average four year FRI interval between 2000 - 2016. However, the longest FRI occurred during the most recent fire cycle (2009-2016) and significant shrub encroachment can be seen during this time.

Additional factors such as seasonality, hydrology and environmental factors on day of burn were examined in a previous Technical Fire Management (TFM) project (2012), however, the results did not statistically identify potential contributors to managing woody shrub encroachment. “Average FRI” and “time since most recent fire treatment” appear to be the most significant.



Very few woody shrubs – 2 years post burn.



Small woody shrubs visible – 3 years post burn. This plot had maintained a short (≤ 4 years) FRI prior.



6 years post burn with significant shrub encroachment.



2016 prescribed fire treatment with >75% top-kill of understory vegetation. We predict the 1-year post fire site visit, in 2017, will show if there is at least a 50% reduction in woody shrubs at one year post fire. However, in order to maintain/reduce this vegetation, fire treatments will likely need to maintain at least a 4-year fire return interval or shorter.