



**Big Thicket National Preserve
National Park Service
Fire Ecology Annual Report
Calendar Year 2011**

A. Summary

Big Thicket National Preserve started the year in a 20 inch rain deficit from 2010, with a 2011 rainfall total of 42 inches, 13 inches below average. The droughty winter set the stage for the longest and most severe drought in east Texas, which fueled the most intense fire season in recent history. Big Thicket remained in severity from April to September with a total of 11 wildfires in the Preserve, including the 797 acre Pipeline Road Wildfire. In spite of a very busy year fighting fire, the fire ecology program still completed monitoring workloads, tracked live fuel moisture trends, managed fire NEPA, coordinated longleaf pine restoration plantings, attended meetings, submitted proposals, improved GIS data for the Preserve, and conducted several presentations. The most noteworthy accomplishment for the year is that there were no injuries sustained from working in the unrelenting Texas heat.

Fire Support

Although no prescribed burns were conducted in 2011, we remained in suppression mode for most of the year, working many weekends and holidays to assist with severity staffing. The damage incurred from the Pipeline Road wildfire prompted the request for a BAER team and the fire ecologist, Deanna Boensch, helped assess vegetation impacts, while the FEMO crew read CBI plots to monitor fire severity. The new lead FEMO, Diane Lockwood, also assisted with improving GIS spatial data for the Preserve by improving roads, trails, and infrastructure data. In addition, 20 years of GIS cultural data was combined into a working geodatabase. Finally, every two weeks live fuel moisture data was collected and added to the National Live Fuel Moisture Database.

Monitoring Activities

The seasonal monitoring crew completed monitoring of fire effects plots, rapid assessment plots, CBI plots, Texas Trailing Phlox plots, and conducted seedling mortality surveys in longleaf pine restoration areas. We were unable to expand into under-sampled burn units, however those areas will be addressed in 2012. This was the second year rapid assessment plots were read, which followed protocol developed by a vegetation ecologist for longleaf pine ecosystems. The data is more qualitative and focused on ranges, however we will need to further examine results in 2012 to determine if these methods are appropriate for monitoring future management objectives. FIA plots may also be an alternative, since they are widely used in surrounding areas.



Presentations and Data Reports

Although there were no prescribed burns to report on for 2011, we still provided reports on wildfires including CBI plots for Pipeline Road wildfire and numerous photo points of pre and post fire line rehab, since most wildfires were suppressed using dozer lines. We summarized weather and live fuel moisture data, keeping current graphs available to managers throughout the year. Texas trailing phlox data was summarized and shared with partners involved with reintroduction efforts. Longleaf pine seedling survivorship and densities were shared with managers and partners involved with restoration efforts. All projects were summarized in a year end meeting which included fire staff, resource management staff, the superintendent, and administrative personnel. The fire ecologist also presented to the local Sierra Club summarizing the 2011 fire season and to the TX/LA longleaf pine taskforce's understory working group to communicate understory restoration work conducted at the Preserve.

GIS Data Development

The lead fire effects monitor also reported on improvements made to spatial data layers (infrastructure and cultural). The GIS project was funded by the national office to help with spatial data needs. The Preserve now has compiled information on cultural data for consultation with the TX SHPO and a reference for cultural site locations for fire personnel in the event of a wildfire. Additionally, navigation maps were improved by labeling roads and trails.

Fire Ecology Planning

The fire ecologist continued to manage CE's and administrative records in PEPC for fire projects and completed COTR training to lead the FMP EA contract. During the fall of 2011, the ecologist hosted a kick-off and internal scoping meeting and gave a presentation on the fire program and coordinated field visits to assist the contractor with document writing. The FMP EA is scheduled to be completed in FY12. The EA will precede the re-write of the 2004 FMP, and the fire ecology program will need to re-write the monitoring plans as well. Burn objectives, restoration, and research priorities will also need to be improved for 2012.

Collaboration and Partnerships

The fire ecology program coordinated volunteer work projects with 3 different groups to plant over 13,000 longleaf pine seedlings which totaled to almost 900 volunteer work hours. The fire ecologist facilitated meetings and restoration planning with park staff and The Nature Conservancy. The fire ecology program also attended numerous meetings and is involved in various efforts to conduct restoration and fire management treatments with fire dependant ecosystems.

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
Big Thicket	Upland Pine	BITH FEMO	10	-	5	15	25
Big Thicket	Upland Pine-Oak	BITH FEMO	10	-	5	15	30
Big Thicket	Mid-slope Pine-Oak	BITH FEMO	5	-	10	15	30
Big Thicket	Lower-slope Pine-Oak	BITH FEMO			10	10	15
Big Thicket	Sandhill Forest	BITH FEMO	5		10	15	15
Big Thicket	Wetland Pine Savanna	BITH FEMO	-	-	10	10	25
Big Thicket	Control Plots	BITH FEMO	-	-	-	70	105
Big Thicket	Upland Pine Forest (Turkey Creek)	Rapid Assessment	-	-	16	16	16
Big Thicket	Upland Pine Oak Forest (Big Sandy)	Rapid Assessment	8	-	-	8	8
Big Thicket	Pipeline Road Wildfire	CBI	-	37	-	37	37
Total			38	37	66	211	306

BITH FEMO refers to the plots established by Rice University to monitor fire effects. Most of the methods are similar to FMH but not identical.



Table 2. Fire Ecology Staffing 2011

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Deanna Boensch	1/1/2011	12/31/2011	26	No	Refresher, Defensive Driving, CPR, COTR Training, Denver IMR/MWR Fire Ecology Meeting
Diane Lockwood	7/3/2012	12/31/2011	11	No	Refresher, Defensive Driving, Denver IMR/MWR Fire Ecology Meeting
Alicia Rodriguez	3/27/2011	9/10/2011	12	No	Refresher
Jerolyn Byrne	4/10/2011	9/10/2011	11	No	Refresher, S-290
Tim McClung	4/10/2011	9/10/2011	11	No	Refresher, FEMO Taskbook initiated

Table 3. 2011 Management Objectives and Monitoring Results

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?	Year Last Analysis Completed
Upland Pine – Pitcher Plant Rx	30-80% total fuel reduction – Immediate Post Burn	Total fuel reduction = 36% (<i>n=9 plots, 1 fire</i>)	YES	2010
	Reduce seedling and pole size tree density 25-50% within 1 year post burn	Total reduction = 26%	YES	New plots installed 2010
Wetland Pine Savanna -HCU	30-80% total fuel reduction – Immediate Post Burn	Total fuel reduction = 38% (<i>n=5 plots, 1 fire</i>)	YES	2010
	Reduce seedling and pole size tree density 25-50% within 1 year post burn		NO	
Wetland Pine Savanna -LRU	30-80% total fuel reduction – 1 year post fire	Total fuel reduction = 29% (<i>n=5 plots, 1 fire</i>)	NO – low intensity Rx	2005
	Reduce sapling tree density 25-50% within 1 year post burn	Total sapling reduction = 30%	YES	2005

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	15%	- Managed 2 CE's for MFR, 1 for fitness trail - Reviewed proposals and selected contractor for FMP EA - Serve at COR & ID Team Lead for FMP EA (completed in 2012) - PEPC administration - Assist with planning fuels projects for FY12 - Reviewed burn plans for BITH
Presentations	5%	- Presentation to all BITH staff on FY11 work and results. - Presentation to TX/LA Longleaf Restoration Understory Working Group on understory restoration for BITH - Presentation to Gulf Triangle Sierra Club on the 2011 fire season for BITH - Provided fire information board for Visitor Center during severity.
NPS Meetings/ task groups	10%	- Weekly Fire Management Meetings - Resource Management Meetings: GIS, Vegetation Maps. - Meeting with NPS and TX SHPO in Austin, TX - Scoping for FMP EA - Longleaf Pine Taskforce Field Day in Longleaf, LA and Understory Working Group meeting in Nacogdoches, TX - BITH ATBI Science Committee Meetings - Denver IMR/MWR Fire Ecology Meeting
Interagency work	10%	- Facilitate Longleaf Pine Restoration Team Meetings with TNC - Participate with TX/LA Longleaf Pine Taskforce - Coordinate St Michael's Volunteer Group, Sierra Club, and NPCA longleaf pine seedling plantings for BITH for a total of 900 hours of volunteer work.
Wildfire Assignments	25%	- Assist with suppression efforts on 8 different wildfires for BITH (lasting multiple days for each incident) and 7 different TFS Mutual aid fires for IA – served as FFT1 and FEMO - Worked weekends, and holidays from April to September to support fire operations during severity.
Prescribed fire projects	0	No Prescribed Burns were conducted at BITH, due to drought, burn ban, and severity conditions.
Non-fire fuels projects	0	
Research	5%	Assisted with the coordination of a JFSP proposal.
Data collection	10%	Lead the seasonal crew in the absence of a lead monitor
Data entry	0	Monitors completed data entry
Data analysis	5%	Summarized data for 2011 Fire Ecology Presentation and Annual Report
Supervision/Admin	15%	- Conducted lead FEMO duties from March-July - Hired Permanent Lead Monitor (arrived in July) - CA-1 and worker comp paperwork for seasonal - Travel and time paperwork
Training	<5%	- Firefighter refresher, CPR, Defensive Driving - COTR Training
Miscellaneous	<5%	- BAER work at BITH - Clean Office

C. Fire effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew 2011 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	30%	• Pre-burn plots • 1st year • 2nd year • Control plots
WUI plots	<5%	• Hickory Creek WUI plots
CBI plots	<5%	• Pipeline Road Wildfire Plots
Other plot work	10%	• Rapid Assessment • TX Trailing Phlox Monitoring • Longleaf Pine Seedling Mortality Surveys
Wildfire assignments	15%	• 7 NPS Wildfires • 3 Mutual aid Wildfires
Prescribed fire projects	0	
Non-fire fuels projects	0	
Travel out-of-park for plot or project work	0	
Data entry	15%	• Completed all data entry for 2011
Data analysis	<5%	• Provided some data summaries for annual fire ecology presentation
Supervision/Admin	<5%	• Lead Monitor arrived toward the end of the monitoring season, and assisted Fire Ecologist with supervision and logistics
Training	<5%	• Defensive Driving, Annual Fire Refresher • S 290
Miscellaneous	5%	• Updated GIS Infrastructure, Cultural, Trails, Boundary • Bi-Weekly Live Fuel Moisture Data Collection

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?
Big Thicket National Preserve	no	2001	0	1
Padre Island National Seashore	no	2006	0	0
Lyndon B Johnson National Historical Park	no	N/A – no treatments planned	0	0
San Antonio Missions National Historical Park	no	N/A – no treatments planned	0	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*
Big Thicket National Preserve	100%	100%	0	0	8	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?*
Big Thicket National Preserve	No projects completed for 2011	1	1	No – but looking to use it in the future.

* 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
Big Thicket National Preserve	No – plans are up for rewrite in 2012	1	0	0	Collaborated on JFSP proposal for TX w/TNC

*Number of funded research projects, new or ongoing, supported by the fire ecology program including logistical info or support, staffing, etc.

E. 2012 Direction

2011 was a very difficult year for the fire ecology program, as we were without the lead monitor position most of the year and the wildfire season hampered efforts to improve the program. The top priority for 2012 for the fire ecologist is to complete the FMP EA by the end of the fiscal year. The fire ecologist also plans to improve objectives for prescribed burns, which will also involve establishing desired future conditions for the Preserve. The lead monitor will work with FFI and add backlogged data. The fire effects monitoring plan will also need to be re-written in 2012 along with monitoring plans for cluster parks. Finally, the monitoring crew will work on installing plots in areas in need of additional monitoring.

F. Optional Information

To help in the ongoing effort to improve FFI, please include any feedback or suggestions here based on your experiences using FFI.

We received our converted FFI data in May 2010, however when the lead monitor announced her departure over the winter, it was put on hold. The 2011 fire season further delayed working with the database. The current lead monitor will be working with FFI before the crew starts in the Spring to quality check and enter the backlog of data from 2010 and 2011. We had hoped to attend the Jan 2012 FFI training, however budget restraints kept us from traveling to Boise. We plan to work independently with the database and when issues arise seek help from other fire ecology users when needed.

Alternative Monitoring

Texas Trailing Phlox – The fire ecology program continues to be responsible for the monitoring of the natural and reintroduced plants of the endangered Texas Trailing Phlox. The summer's drought and wildfire season allowed for a unique experiment for the reintroduction efforts of this species. The most recent reintroduction occurred on private timber company property. This stand was selected due to its high quality habitat including a mature overstory longleaf pine overstory with little midstory component and a dense grassy understory. It had been a couple of years since the last prescribed fire and the litter accumulation and competition from grasses had reduced the plants vitality. A wildfire occurred during the peak of the drought, and we feared most of the plants had died, however shortly after the fire all the plants had re-sprouted and were flowering. This was important data for the future restoration of the phlox, since it stresses the importance of quality habitat for the species survival. Furthermore, the high rates of survivorship are the best numbers every documented in over a decade of restoration efforts. If Big Thicket continues to experience hot dry summers with an active summer fire season, it will be imperative that quality habitat be established. Restoring longleaf pine forest with an established understory and frequent prescribed fire is critical to the future survival of this endangered species. The fire ecologist worked with a regional botanist on reviewing a PMIS proposal to enhance restoration of the phlox, which was rated as the top priority for the Preserve.

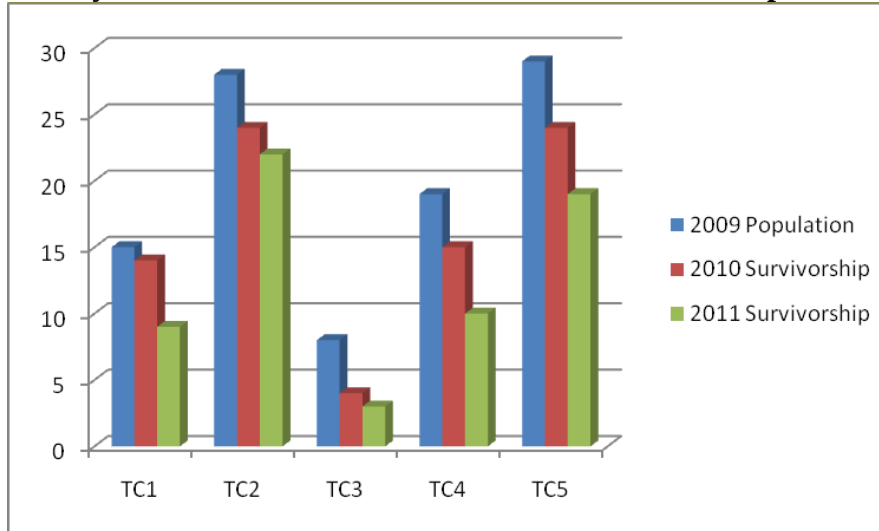


Texas trailing phlox in bloom

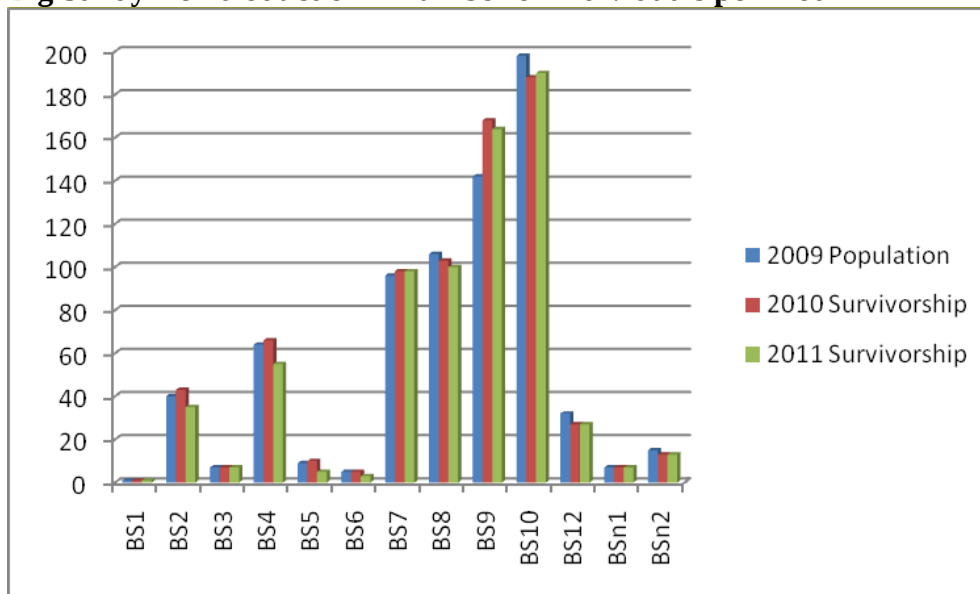
Plot # (125 plants each)	Percent Survivorship
Plot 1	67%
Plot 2	100%
Plot 3	67%
Plot 4	95%
Plot 5	89%

The following graphs capture the survivorship of the Phlox at reintroduction sites at BITH:

Turkey Creek Reintroduction – Number of Individuals per Plot



Big Sandy Reintroduction – Number of Individuals per Plot



Longleaf Pine Restoration

The fire ecology program also continued monitoring seedling mortality in areas of longleaf pine restoration. In January, the fire ecologist coordinated planting over 13,000 seedlings with three different volunteer groups (St Michael's College, The Sierra Club, and the National Parks Conservation Association). Approximately 900 hours of volunteer work was coordinated to plant the seedlings. The ecologist also purchased seedlings for 2012, and coordinated future plantings with the NPCA, which is the biggest event with over 50 volunteers.

Overall, several restoration sites are in good condition, however the North Turkey Creek site continues to be challenging to restore. The seedlings planted in January 2011, did not fair well during the drought and over 60% of the seedlings perished. An additional planting was planned for 2012.

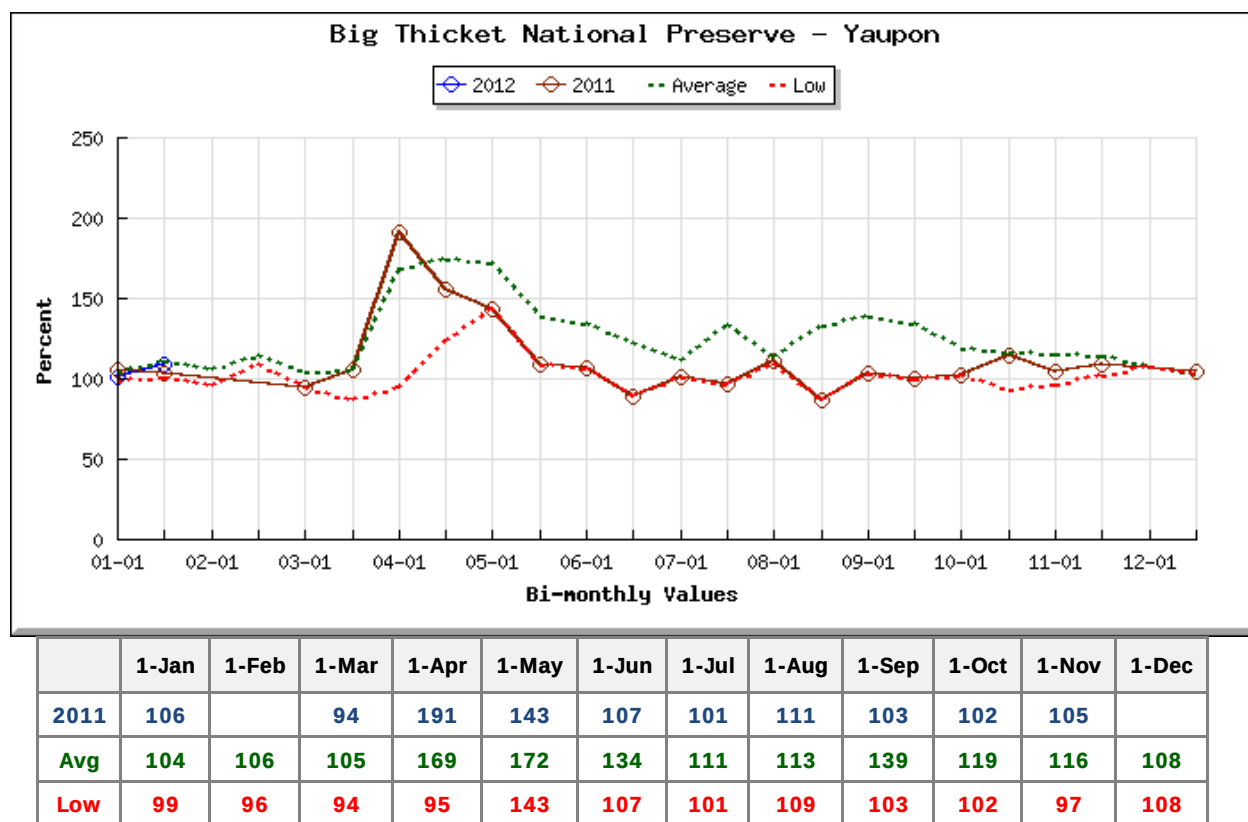
NPCA Volunteers help to plant longleaf pine on Martin Luther King Day 2011



Live Fuel Moisture Monitoring Program

Since live fuel moisture has a profound effect on the behavior of fire, the fire ecology program has made a committed effort to collecting bi-monthly fuel data for the woody species yaupon. This data is an important tool for monitoring trends and conditions which can help predict fire occurrence and intensity within the preserve. All of the live fuel moisture data that is collected is entered into the National Fuel Moisture Database resulting in a long term aggregate of data that can be easily viewed by any interested personnel.

The year 2011 saw record-breaking heat and drought conditions which can be reflected in the live fuel moisture data. In fact the summer of 2011, had the lowest values of fuel moisture data of the past 5 years. Temperature values exceeded 100 degrees for 50 of the summer days and broke all time record highs for 31 days. Precipitation in the summer was practically non-existent and added to the record high temperatures contributed to one of the worst wildfire seasons Big Thicket has ever seen.



Pipeline Road Wildfire BAER assessment

Although the Pipeline Road wildfire was small compared to most assessed by a BAER team, it was a large fire for BITH damaging an established trail within the Turkey Creek Unit including multiple boardwalks and benches. D-8 Dozer lines from suppression efforts needed to be rehabbed, as well as an assessment of exotic plant invasion. The fire ecologist worked on the vegetation assessment with the team and it was determined that re-seeding efforts were not necessary; however, the unit would have to be monitored and treated for exotics, primarily Chinese Tallow. The initial threat of invasion by Tallow was underestimated by the ecologist since the majority of the fire was low to moderate intensity, and the predominance of the exotic tree in the overstory as a seed source was not evident until several months post-burn. The drought conditions resulted in a higher than expected overstory tree mortality as many native trees were killed at the roots. The Preserve's resource management division will have to manage the extensive invasion of Tallow in the fire scar and conduct herbicide treatments.

The following images include a fire map, BARC imagery, Pre and Post dozer line rehabilitation photos and some images of fighting the fire:

