



Big Thicket National Preserve
National Park Service
Fire Ecology Annual Report
Calendar Year 2006

Summary

This was a year of recovery as Big Thicket National Preserve continued to clean up and monitor the damage from hurricane Rita (September 2005). Fortunately, this year did not bring a hurricane, however rainfall amounts resulted in some of the worst floods on record. The month of October brought almost 30 inches of rain flooding many portions of the preserve and causing more damage to resources and park infrastructure. By the end of 2006, we had a rainfall total of 85 inches (our yearly average is 50-55 inches). It has been frustrating and challenging working in these very wet conditions, however once drying weather arrives, we hope to accomplish several prescribed burns, resume mechanically treating hazard fuels, and continue work on longleaf pine restoration throughout the preserve.

Throughout 2006, Big Thicket completed 4 prescribed burns, including the Solo burn that was recently a clear-cut plantation before the park service took ownership. Fire management conducted a prescribed burn to help site prep for planting longleaf pine seedlings. Resource management purchased 37,800 seedlings and The Nature Conservancy contracted and paid for the planting with funds from The Longleaf Ecosystem Restoration Project. This was possible because of an updated cooperative agreement with BTNP and TNC that allowed funds from the original 51 acre project to be applied to any longleaf restoration work throughout the preserve, including up to 8,000 acres. The fire ecologist started leading the longleaf pine restoration group meetings where BTNP resource management staff and TNC staff meet on a regular basis to discuss current and future projects concerning restoration of longleaf pine.

This year, the fire management program received 2 years funding for a Gyro Trac and an equipment operator. The Gyro Trac has been utilized for hazardous fuel reduction and completed mechanical treatments in the Big Sandy Unit and the Turkey Creek Unit. In FY 07 the Gyro Trac will be focused on a 410 acre hazardous fuel reduction project. The Gyro Trac will also be used to prep certain fire lines. The fire effects program installed brown lines and took photopoints to monitor the Gyro Trac treatments.

In July 2006, a 6.25 acre tract of land was donated to the park service to allow for a permanent fire management facility to be constructed. The fire management staff worked with the Intermountain region to prepare a blueprint and complete the NEPA work for the construction of the facility. The lead fire effects monitor conducted photo point and mechanical treatment monitoring and the seasonal fire effects monitor was able to complete a cultural

resource assessment of the donated land. The fire ecologist worked on the comments to the EA, correspondence with the SHPO, and completing the FONSI.

In July, Iola Hallock started work as the new lead fire effects monitor for BTNP. She transferred from the USFS with over 10 years experience in fire suppression and management. We are very happy to have her on staff and the year 2007 is sure to bring many accomplishments to our program with her added help. Iola has been assigned to track the live fuel moistures throughout the year and will be able to provide summary reports. In the Fall, Iola was also able to complete Gyro Trac plot reads with the assistance of a foreign exchange park ranger from Korea. Sang Ho Kim spent 5 weeks with Iola and was able to learn plot protocol and species names very quickly even with a slight language barrier.

Deanna Boensch completed 2 semesters worth of classes at Stephen F Austin State University. She will complete her coursework in May 2007 in requirements for a masters degree. With the data collected from the 2007 field season, data analysis will begin for the fire effects data of Big Thicket National Preserve. 2007 will be a very busy field season as post-hurricane control plots will have to be read and an herbaceous layer protocol will be added to the plots.



Seasonal Brian Fife reading a Brown's Line Transect in hurricane blowdown



Fire burns through pitcher plant bog during a prescribed burn.

Table 1. Fire Effects Plot Workload 2006

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
BigThicket	Upland Pine	RICE			4	4
	Upper Pine/Oak	RICE	1		5	6
	Midslope Pine/Oak	RICE	1		3	4
	Lower Oak/Pine	RICE			3	3
	Wetland Pine Savannah	RICE	2		1	3
	Sandhill	RICE			3	3
	Wildland Urban Interface	RICE			2	2
Total			4		21	25

Table 2. Fire Ecology Staffing 2006

Monitor	Starting Date	Ending Date	# of Pay Periods	Training and Development
Deanna Boensch Fire Ecologist	1/1/06	12/31/06	26	Completed HECM taskbook, I-300 and L-280. Attended Stephen F Austin State University for classes (Research Methods, Regression, Wetland Delineation, Fire Ecology, GIS in Natural Resources, and Regional Silviculture)
Iola Hallock Lead FEMO	7/11/06	12/31/06	11	S-244 Field Observer Veg. ID & Plot work training
Jonathan Brotzman FEMO Seasonal	5/15/06	9/9/06	8.5	Chainsaw & ATV Certification, Archeological assessment, 1 Wildfire assignment
Lily Zhou FEMO Seasonal	5/15/06	9/29/06	10	S-290 Intermediate Fire Behavior, Rx Burn & Wildfire Experience, Chainsaw & ATV Certification
Brian Fife FEMO Seasonal	5/30/06	9/29/06	9	S-130/190 Basic Firefighter Rx Burn & Wildfire Experience Chainsaw & ATV Certification
Sang Ho Kim	10/23/06	11/17/06	Volunteer	International Exchange Ranger Veg ID & Plot work training Practiced English

Table 3. Management Objectives and Monitoring Results 2006

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
North Turkey Creek Longleaf Restoration	50-100% total fuel reduction	Total fuel reduction = 15% (<i>n</i> =5 plots, 2 fires)	NO
	Top kill woody shrubs and trees 20-50%	First Order Fire Effects Plots indicated 75-90% reduction	YES

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
Solo Fire	Reduce amount of litter by 50% and decrease the amount of fuels by 75%.	Plot work is incomplete, however ocular estimated indicate objective was achieved.	N/A
	Top kill woody shrubs and trees 75-100%	First Order Fire Effects Plots indicated 80-90% reduction	YES

Fire ecologist accomplishments and area of focus

Fire Ecologist: Deanna Boensch

Category	Percent Time	Accomplishments and/or areas of activities
Planning	20%	- Responded to public comments on New Fire Mgmt Facility EA - Worked with the SHPO and Region on cultural monitoring of new building site - Worked on the FONSI for the New Fire Mgmt Facility - Served as an IDT member for the Big Sandy Longleaf Pine Restoration EA (scoping and draft reviews) - Wrote a section for the Feral Hog Mgmt EA - Developed a monitoring plan for seedling survival and restoration work for longleaf pine sites - Developed a plot for monitoring mechanical treatments of hazard fuel areas
Presentations	<5%	- Provided a poster on North Turkey Creek for Regional FMO Mtg - Presented data to longleaf pine restoration team - Fire Ecology talk with SCA volunteers "GIS in Wildfire Management" powerpoint presentation to students and faculty at Stephen F Austin State University
NPS Meetings/ task groups	15%	- Attended the Regional FMO meeting - Lead meetings and served as a member of a Longleaf Pine Restoration team with The Nature Conservancy - Served on the Texas Trailing Phlox working group - Served on the Planning Committee for the Big Thicket Science Conference - Attended Fire Ecology Stats Workshop in Ft Collins - Attended meetings for All Taxa Biotic Inventory Project
Interagency work	0	
Fire Assignments	25%	- Served as FEMO and FFT1 on BITH Rx Burns - Served as ENOP and FFT1 on mutual aid wildfires - Completed two 14 day assignments as HECM(t) for East and West Texas summer fires
Research/PLOT Work	10%	- Lead the Fire Effects Monitoring Crew in Plot Work for the first part of the season while the Lead position was vacant - Collected and read journal articles concerning longleaf pine restoration
Data entry	<5%	Worked on quality checking data and some entry
Data Conversion	0	No Conversion for our Park
Data analysis	<5%	- Analyzed fuel loadings after hurricane - Analyzed seedling mortality after hurricane and burning on longleaf pine restoration site

Supervision/Admin	10%	• Worked with HR Franchise and developed Job Analysis and Crediting Plan for Lead Monitor Position • Assisted with interviews and hiring of permanent full time lead monitor • Developed new KSA's, Job Analysis, and Crediting Plan for seasonal fire effects monitors, and helped interview and hire seasonal positions • Lead seasonal fire effects crew for half the season while lead position was vacant • Orientated and trained new lead monitor • Travel and Time documents
Training	15%	• Firefighter refresher, Defensive Driving, Preparedness Drills... • I-300 and L-280 at Bastrop, TX Fire Academy • Attended Stephen F Austin State University completing 18 credit hours of classes (Research Methods, Regression, Wetland Delineation, Fire Ecology, GIS in Natural Resources, and Regional Silviculture) • PT
Miscellaneous	<5%	• Helped with maintenance around office buildings and compounds (cleaning ect.) • Managing files and other mundane office duties

Fire effects crew accomplishments and area of focus.

This section deals with roles and functions of the fire effects crew. Identify accomplishments and/or focus areas along with a rough estimate of the amount of time spent in these areas (see table format and example below).

Fire Effect Crew Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	20%	
WUI plots	1%	• Read Hickory Creek WUI Plots. • Gyro-Trac plots are considered WUI and exotic vegetation monitoring but are counted under Gyro Trac monitoring plots.
CBI plots		No CBI plots exist on the preserve
Other plot work	12%	Gyro-Trac plots
Fire Assignments	17%	• 1 fire assignment on preserve. • Helped with Prescribed Fire Operations at BITH • All 3 seasonals went on a 14 day detail at FFT2's.
Fuels Project work	10%	• Entire FEM crew assisted fuels crew in Rx prep and burning. • Lead FEMO spent 2 days on Rx fire assignment with USFWS.
Data entry	14%	Completed data entry of all plot data for 2006
Data conversion	0	N/A
Data analysis	0	
Supervision/Admin	5%	• Shared in supervision of fire effects crew during transition • Completed fire effects plot work • Hosted international exchange ranger from Korea
Training	13%	• 1 seasonal to S-244 Field Observer training • 1 seasonal to S-290 Intermediate Fire Behavior • 1 seasonal to S-130/190 Basic FFT training • All seasonals received Chainsaw and ATV training & certification • All seasonals received vegetation identification and plot work training.

Miscellaneous	12%	• Bird banding • Seasonal FEMO conducted an archeological assessment of newly acquired land that is planned for New Fire Management Facility • Hunter signup • NOAA meeting • Lead FEMO functioned as COR trainee on herbicide contract.
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GYRO TRAC MONITORING

One of the challenges fuels monitoring programs face is developing monitoring techniques that fit newly implemented fuels treatment methods especially in the Wildland Urban Interface. In 2006 the Big Thicket National Preserve implemented the use of the Gyro-Trac mulching machine in order to decrease fuel loading caused by hurricane Rita in the wildland urban interface. The fire effects monitoring program found it necessary to develop a Gyro-Trac monitoring in order to document how effectively fuel loading was manipulated and if the treatment impacted rare, endangered, invasive or exotic vegetation.

The Gyro-Trac monitoring survey consists of three parts completed before and after fuels treatment. These 3 parts consist of recording a digital photo point, conducting a Brown's survey line and determining herbaceous plant cover (by guilds). The presence of exotic, invasive, rare or endangered plant species is recorded at any time during the survey.

The results of Gyro-Trac monitoring provide both a pictorial and data specific way to follow the Gyro-Trac's progress in reducing wildfire hazards and risks in the wildland urban interface, and its impact to soils and the ecosystem. Additional benefits include establishing a base line for monitoring the effects of mechanical fuels treatment on exotic and invasive plants and on rare and native plants endemic to the southeast Texas ecosystems.



Pre Gyro-Trac treatment in Big Sandy WUI



Post Gyro-Trac treatment in Big Sandy WUI

NORTH TURKEY CREEK LONGLEAF RESTORATION PROJECT

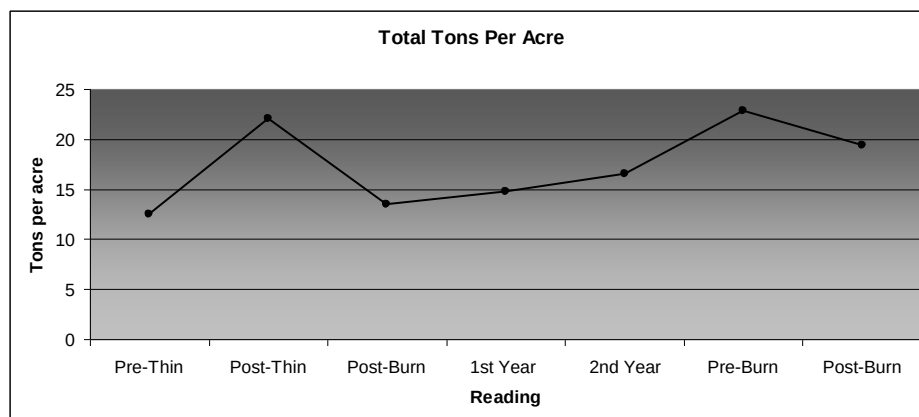
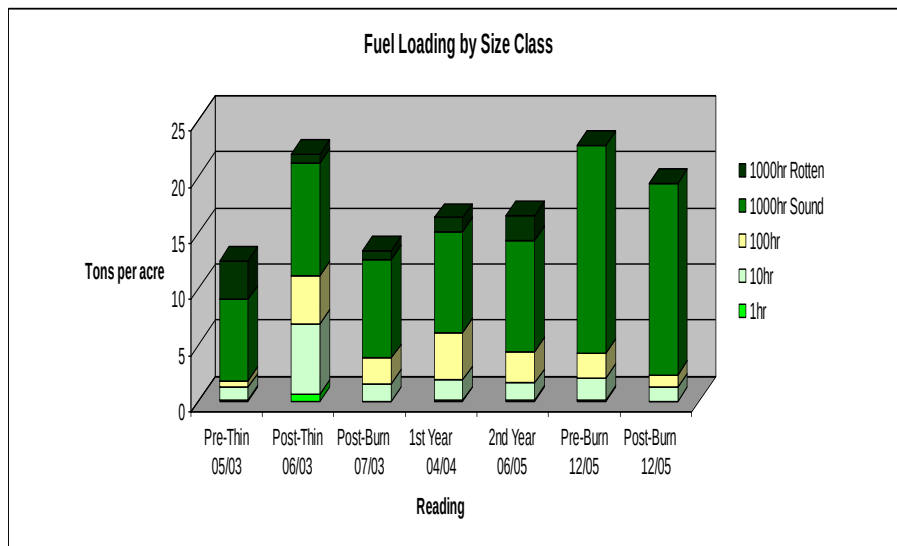
(Portions of Reports Completed on the Project)

Burn Objectives

- Reduce dead woody fuel loading created by mechanical treatments 50-100%.
- Top kill 25-50% of re-sprouting brush and hardwood trees.
- Keep longleaf seedling mortality below 50%.

Results

- Fuel loading readings indicate that the first prescribed burn reduced fuel loading by almost 40%, the hurricane increased the fuel loading by 33%, and the post-hurricane burn reduced fuels by 15%.
- The burn completed on December 11, 2005 was of moderate intensity and resulted in 90% top kill of the re-sprouting brush, and 40% exposure of mineral soil.
- Initial ocular assessments of the unit indicate that the longleaf tree seedling mortality is below 50%, however rates are better determined during the growing season.
- Brush re-sprouts, pine seedlings, and herbaceous cover will have to be carefully managed, so that the longleaf seedlings are not out-competed for sunlight. This is especially important now that hurricane Rita created a more open stand.





Pre-Hurricane



Post-Hurricane

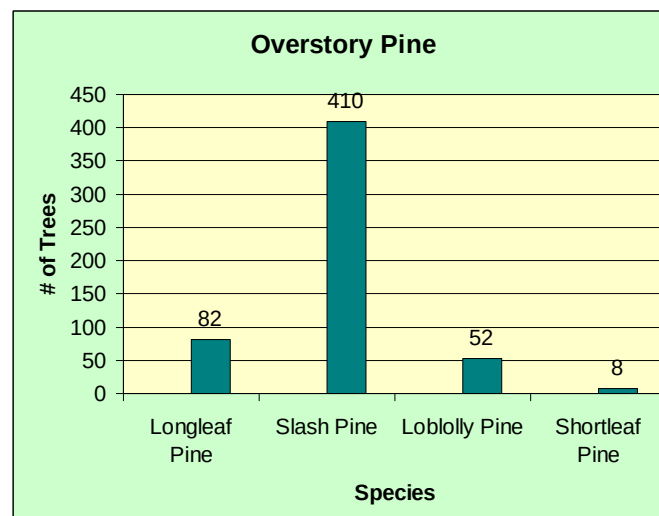


Post-Burn

North Turkey Creek Longleaf Restoration Seedling and Overstory Survey

Overstory Tree Tally

- Across the entire unit there was a total of 552 overstory trees.
- Averaging across the entire unit then there is a density of approximately ten overstory pine trees per acre (hardwoods not included).
- Slash pine occupies approximately 75% of the overstory.



Seedling Survey

The count data for each plot was multiplied by a factor of 100 to get the density per acre for that plot for both the longleaf group (PIPA) and the other pine group (PISP). Those densities of seedlings per acre of each plot were summed and then divided by the total number of plots to give an average density of seedlings across the entire unit.

This data indicates the average density of longleaf pine seedlings over the unit is 92 seedlings per acre and the average density of other pine species is 316 seedlings per acre.

In terms of frequency, the data also shows approximately 50% of the 110 plots surveyed did not have an occurrence of any pine seedling. These bare sites have resulted from higher fire intensities or greater amounts of hardwood competition. Nevertheless, there is plenty of available space for competitors, increasing the need to plant more longleaf seedlings.

Management Considerations

At 92 seedlings per acre, the longleaf has been reduced to 1/3 of the original planting stock since the hurricane and most recent prescribed burn. As competition pressures increase, the seedlings will continue to decline. The best strategies for reducing the competition would be to initiate another chemical treatment of the hardwood tree and brush re-sprouts, followed by another prescribed burn to consume the other pine seedlings and further reduce fuel loadings. After the burn, the stand would be well suited for an additional planting of longleaf pine seedlings. Since the unit was burned last in December of 2005, the next burn should occur during winter of 2007. A growing season burn is also an option since the longleaf seedlings will be in the later phases of the grass stage. This shorter fire return interval will allow for a better consumption of the slash pine seedlings. Finally, the additional planting of longleaf seedlings should occur shortly after the prescribed burn.