

**POST-OPERATIONAL VEGETATION AND IMPACT
ASSESSMENT OF THE BIG SANDY CREEK UNIT,
BIG THICKET NATIONAL PRESERVE**



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INTRODUCTION

Dixie Environmental Services Co. (DESCO) and PBS&J conducted a Pre-Operational Vegetation Assessment of the Big Sandy Creek Unit (BSCU) of the Big Thicket National Preserve, (BTNP) April and May, 2003, prior to the commencement of Seismic Assistants, Ltd.'s (SAL) Knight Phase II 3D seismic survey, in order to document the species and composition of vegetation present within the project area. DESCO conducted a Post-Operational Vegetation Assessment of the same area from April to May, 2005. The purpose of the assessments was to gather vegetational data for pre- and post-project comparisons in order to analyze project impacts. The data were also used to evaluate the effectiveness of measures taken to minimize the impact of seismic activities.

This document contains the Post-Operational Vegetation Assessment and analyses of the vegetational composition changes within the BTNP after one growing season following the completion of the Knight Phase II 3D seismic survey. Operations associated with the Knight Phase II 3D within the BTNP were conducted from November 2003 to June 2004. The comparison of data collected as a result of the pre- and post-project vegetation assessments provided a means for determining the quantity and intensity of seismic survey impacts.

These analyses include discussion of impacts attributable to the seismic survey, as well as those resulting from natural occurrences and/or management practices within the BTNP. The main focus of the analyses are any changes at the alliance level; however, change within some individual plots is also provided, to support the basis of impact determination, explain change not attributable to the seismic survey, and/or explain the reason(s) for greater changes in composition observed in some of the individual plots. As part of the assessment of project-related impacts, comparison of data were used to determine if the presence of seismic crews encouraged the introduction and/or spread of noted exotic and/or noxious species within the BSCU.

Background

Seismic Assistants, Ltd (SAL) conducted a three dimensional seismic survey that included the Big Sandy Creek Unit (BSCU) and Menard Creek Corridor Unit of the Big Thicket National (BTNP or Preserve) (**Figure 1**). The project encompassed 98,240 acres (ac), of which 14,300ac were within the BTNP. The project also overlapped the Menard Creek Corridor Unit, which totals 3,359ac. As a part of the effort to meet the regulatory requirements of the National Park Service (NPS) and analyze impacts to existing vegetation within the BTNP, vegetation assessments were conducted prior to the onset of and one growing season after the conclusion of seismic activities.

Vegetation sampling efforts encompassed 95%, or 13,530ac of the BSCU. The Menard Creek Corridor Unit was not included in either pre-or post-operational assessment, as operations in the majority of this unit were cable-only, which result in minimal impact to the environment. In addition, there was a small section in the northern reaches of the BSCU, adjacent to the Alabama Coushatta Reservation, which was not included in either pre- or post-operational assessment, because it was not within the boundaries of the Knight Phase II 3D project area.

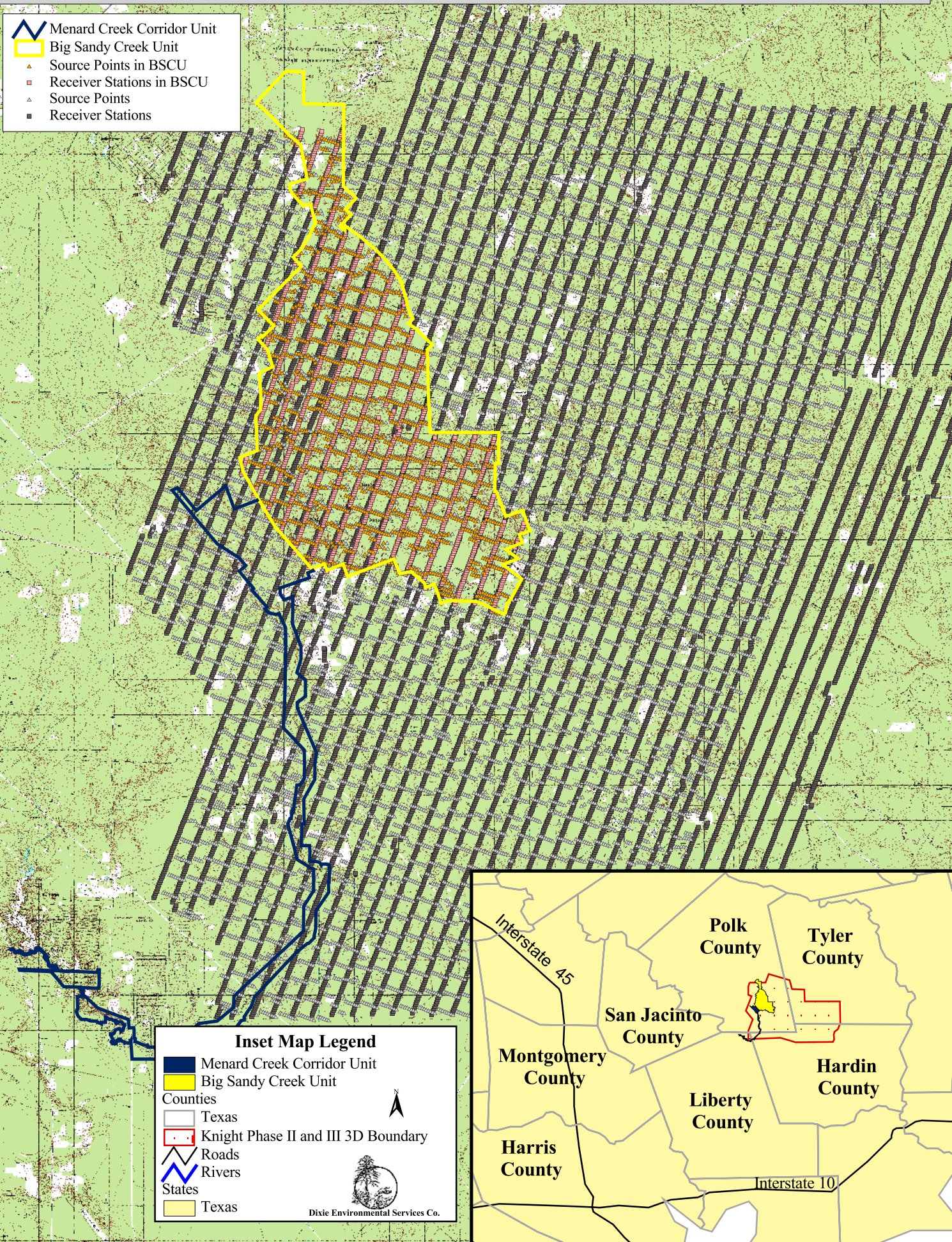
The Pre-Operational Vegetation Assessment was conducted in mid-April to mid-May, 2003, following methodologies and procedures in the document *Big Thicket National Preserve Big Sandy Creek Unit Vegetation Mapping and Sampling Plan* (PBS&J, 2003). The results of the vegetation mapping and sampling program were reported in *Big Thicket National Preserve Pre-Operational Assessment of Vegetation in the Big Sandy Creek Unit, Polk County, Texas* (PBS&J, 2003). The Post-Operational Vegetation Assessment was conducted in late-April to late-May, 2005, following the same methodologies and procedures used in the pre-operational assessment.

Measures Taken to Minimize Impacts

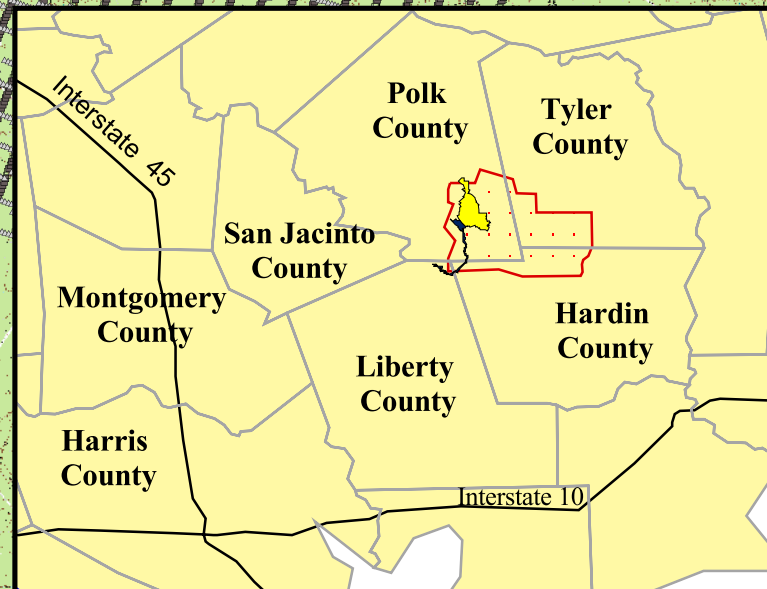
Several methods were implemented during operations to uphold commitments to NPS and insure that SAL conducted operations in the most environmentally friendly and least-invasive manner possible. Third-party environmental monitors for seismic activities were hired at the expense of

Figure 1. Knight Phase II 3D Project Boundary in Relation to Big Thicket National Preserve Units

-  Menard Creek Corridor Unit
-  Big Sandy Creek Unit
-  Source Points in BSCU
-  Receiver Stations in BSCU
-  Source Points
-  Receiver Stations



- Inset Map Legend**
-  Menard Creek Corridor Unit
 -  Big Sandy Creek Unit
 - Counties**
 -  Texas
 -  Knight Phase II and III 3D Boundary
 -  Roads
 -  Rivers
 - States**
 -  Texas
- 
- 
- Dixie Environmental Services Co.



SAL to ensure compliance with the approved *Plan of Operations for a Proposed 3-D Seismic Survey within the Big Sandy Creek, Menard Creek Corridor, and Hickory Creek Savannah Units of the Big Thicket National Preserve* (DESCO, 2004). Monitors provided by DESCO were hired with prior approval of the Preserve Superintendent, and reported directly to the Preserve Superintendent or his representative.

The following measures were used by SAL and monitored by DESCO to minimize impacts to vegetation within the BTNP:

1. Cutting of live woody vegetation was limited to three (3) inches in diameter, measured one (1) foot above ground or at stem collar. All cuts were flush with the ground, and the height of the remaining stump was no greater than one (1) inch from the ground surface. No limbs larger than three (3) inches in diameter, measured at the branch collar or branch bark ridges, were permitted to be cut. The remaining limb did not extend more than one (1) inch beyond the main trunk. Use of motorized cutting equipment was permitted.
2. Any size of yaupon holly (*Ilex vomitoria*) or Chinese tallow (*Sapium sebiferum*) was cut, as necessary. Survey and drill crews were instructed on the identification of each species and shown samples of each. In addition, monitors provided species identification in the field as needed and/or as requested.
3. Vegetation was selectively cut along source and receiver lines. Vegetation was cut in a manner that facilitated access for drilling equipment, while minimizing the amount of vegetation cut.
4. Source points were not placed in baygall or forested swamp habitats in an effort to minimize the potential for rutting from drill equipment.
5. Both receiver and shot points were offset in some instances to avoid threatened and endangered species sites and sensitive areas.

6. Lightweight drilling and support equipment was used to minimize impacts, and operations were conducted on foot, as well as through the use of all-terrain vehicles (ATV) on routes designated by the Preserve Superintendent.
7. Track depths caused by drilling equipment were restricted to a maximum depth of eight (8) inches (20.32 centimeters). In instances when the tracks approached or exceeded eight (8) inches, the equipment was backed out of the area, and alternatives were evaluated (offsetting, waiting for the area to dry, or elimination of the point) in order to determine how the point should be accessed.
8. Drills and other support equipment were not permitted to travel outside the 100-foot (30.48 meters) corridor, unless the access path was approved by both a monitor and an archaeologist.

The most notable of the measures employed was the cutting/damage stipulations, which included the three-inch diameter limit on the size of trees and branches that could be cut or damaged. Crews were frequently schooled on how to measure trees and were provided with the tools to effectively and efficiently measure trees and branches.

Project-Related Impacts to Vegetation

The proposed seismic survey did have some minor impacts on the BTNP and surrounding environment that could not be completely avoided, even when complying with the aforementioned stipulations and operational constraints. Crews were permitted by NPS to cut vegetation less than the stipulated three-inch size limit, so impacts were inevitable on the herbaceous, shrub and midstory layers. One of the more common issues encountered during the project was the cutting or damage of oversized and/or unauthorized trees. This occurred far less than improperly cut trees; however, its occurrence could only be documented and not remedied. To prevent cutting or damage to oversized/unauthorized trees, monitors frequently discussed size stipulations with the crews, along with tree identification and measurement techniques. The majority of the oversized trees that were cut or damaged were only an inch or two above the

stipulated three-inch limit, and all trees impacted by surveying operations were confined to the midstory layer.

Vegetation impacts resulting from the passage of drill equipment were minimal; however, in some cases, trees larger than the stipulated three-inch diameter were impacted. These instances were typically the result of equipment being unable to maneuver in densely vegetated areas. The oversized trees impacted by drilling operations were confined to the midstory layer.

DESCO monitors worked with drill crew scouts and helicopter pilots to minimize impacts to the tree overstory stratum when lifting and lowering equipment used in the water supply process. Although careful locations for the water tanks were chosen, oversized trees were occasionally impacted by water tank delivery and repeated water drops from the helicopter during drilling operations. In these cases, high branches were broken. Oversized trees impacted by water delivery operations were sometimes large enough to be classified as overstory vegetation. This is the only project-related impact that affected the overstory layer; however, in all instances noted by monitors, the impacts to overstory trees were never intense enough to cause instant tree mortality.

Considering the scope of the project and the types and quantities of vegetative cover existing in the BTNP, impacts to oversized trees were minimal, and explainable in most instances. Survey crews cooperated with environmental monitors in a proactive approach to minimize stipulation violations.



METHODOLOGY

DESCO replicated field methodologies from PBS&J (2003) with regards to plot size, data notation, and data analyses during both the pre- and post-operational vegetation assessments. Data collected during the post-operational assessment were compared to the pre-operational assessment data in order to assess changes in vegetative composition of the project area and provide a basis for a discussion of impacts attributable to activities associated with the Knight Phase II 3D seismic survey.

Objectives of the pre- and post-operational assessments had both similarities and differences. The pre-operational assessment was conducted to collect information on the composition of vegetation present in the BTNP at the time of the assessment (2003) and to map vegetation to the “alliance” level according to the International Classification of Ecological Communities (ICEC) hierarchical classification system (Weakley, Patterson, et. al., 1998). Some alliance names include species that are not found in Texas due to the broad range of these alliances. The post-operational assessment was also conducted to collect information on the composition of vegetation present in the BTNP at the time of the assessment; however, mapping alliances was not a concern, as this had already been accomplished as a result of the pre-project assessment. The focus of the post-operational assessment was to provide an accurate assessment of project related impacts by comparing the two data sets. This being said, field methodology and data collection for both efforts were the same; however, sampling design differed to suit the objectives of each assessment.

Pre-Operational Vegetation Assessment

Pre-Operational Vegetation Alliances present within the BSCU were determined through the following steps:

- 1) A review of a map illustrating “Potential Alliances to Occur within the Big Sandy Creek Unit” was conducted and utilized, along with other existing information (soils, topography, etc.) to identify potential alliance boundaries from aerial photography.

- 2) The project area was stratified based on the potential alliance classifications.
- 3) Polygons within each of the potential vegetation classifications were assigned numerical characters and a random sample was assigned for each distinct polygon and then selected for quantitative sampling. All sample plots were designed to coincide with SAL's proposed locations of source and receiver lines.
- 4) The potential alliance classifications identified in the project area were ground-truthed and modified as appropriate.
- 5) Field verified alliance classifications and boundaries were revised from aerial photography to reflect the results of the field investigations.

Sample Design

The exact number of pre-operational sample sites for each vegetation classification follows published ESRI, NCGIA, and Nature Conservancy (1994) and PBS&J (2003). Based on these documents, three to 30 samples were collected for each vegetation class, with the exception of the *Paspalum notatum* Herbaceous Alliance. As a result, only one sample plot was established within this alliance because it is a routinely maintained pipeline easement and is distinctly defined.

For the purposes of the vegetation sampling effort, the project area was considered to have four strata (**Table 1**).

Table 1. Vegetation Layer Classes and Associated Diameters		
Vegetation Strata	Diameter at Breast Height (dbh)	
	Centimeters (cm)	Inches (in)
Overstory (canopy)	> 12.0	> 4.7
Midstory	2.5-12.0	4.7 - 1
Shrub	0.5-2.5	1 – 0.2
Herbaceous	all woody vegetation <0.5 was measured as % cover	all woody vegetation <0.2 was measured as % cover

In summarizing this data, density, dominance (basal area or percent ground cover), and frequency values were determined for each species. Density is the number of individuals per unit area, dominance is the basal area or percent ground cover per unit area, and frequency is the percentage of sample plots containing the species. 'Per unit area' refers to the sample plot size, or 250 square meters (m²). For the data collected, calculations were expressed in both the totals for all species, the plot totals, and relative percentages. Relative percentages for density, dominance, and frequency were summed into a single Importance Value, which reflects importance of the species. Importance Value (IV) evens out an imbalance of meaning applied to any single parameter. Relative Importance Value (RIV) was also calculated, and was used throughout the document for ease of comparison of data (RIVs of all species in a plot/alliance add up to 100%) and consistency with previous publications; however, RIV has no real meaning in forest ecology. Equations for calculating forest dynamics follow Cox (1996):

$$\text{Density} = \frac{\text{Number of Individuals}}{\text{Area Sampled (ha)}}$$

$$\text{Relative Density (\%)} = \frac{\frac{\text{Number of Individuals of a Species}}{\text{Number of Individuals for All Species}}}{1} \times 100$$

$$\text{Frequency} = \frac{\frac{\text{Number of Plots in which Species Occurs}}{\text{Total Number of Plots Sampled}}}{1} \times 100$$

$$\text{Relative Frequency (\%)} = \frac{\frac{\text{Frequency Value for a Species}}{\text{Total of Frequency Values for All Species}}}{1} \times 100$$

$$\text{Dominance} = \frac{\frac{\text{Basal Area of a Species / or canopy cover}}{\text{Area Sampled}}}{1} \times 100$$

$$\text{Relative Dominance (\%)} = \frac{\text{Number of Individuals of a Species}}{\text{Total of Dominance Values for All Species}} \times 100$$

$$\text{Importance Value (\%)} = \text{Relative Density} + \text{Relative Frequency} + \text{Relative Dominance}$$

$$\text{Relative Importance Value (\%)} = \frac{\text{Importance Value}}{3}$$

In addition to quantitative sampling, qualitative observations were made at each plot to assist in describing and classifying vegetative communities of the project area. Information was collected on topographic position, landforms, hydrologic regime, and soils, and was supported by photographic documentation.

Woodland Stands

Overstory-Midstory

Quantitative sampling data were collected for the overstory and midstory strata using 250m² plots (25m x 10m). Plot boundaries were determined by measuring 12.5m directly north and south of a center point and 5m directly east and west of the center point. This was accomplished by using a hand held compass and using a pre-measured rope or measuring tape. Each center point or plot center was marked with a flagged PVC pipe. In addition, the plot number was marked on the PVC pipe with permanent ink. Data collected during survey efforts included geographical coordinates of the center point, woody and herbaceous plant species present within the plot, number of occurrences of each plant species, and basal area obtained by collecting the diameter at breast height (DBH) of each individual. Data on the overstory and midstory were separated during data processing. Geographical coordinates of the center point were obtained by using a hand-held GPS unit (Magellan Meridian Gold, 3m accuracy).

Shrub Layer

The shrub component was sampled using a 25m² nested subplot (5m x 5m) within the 250m² plot used for the overstory and midstory species. The sample plot was identified within the 250m² overstory/midstory plot using a 25m² plot (5m x 5m). The center point was the same for both the

overstory and shrub plot. Plot boundaries were determined by measuring 2.5m directly north, south, east, and west of the center point. Data collected during survey efforts included shrub species within the plot, frequency of each species and basal coverage obtained by collecting the stem diameter of each individual.

Herbaceous Stratum

The herbaceous stratum was sampled using a 1m² (1m x 1m) quadrat. Ten random 1m² plots were sampled within the 250m² overstory/midstory plot to determine the herbaceous plant species and their coverage. Direction and distance was recorded, using a hand held compass and measuring tape, from the center point of the 250m² overstory/midstory plot to the center point of each herbaceous plot.

Data collected included species within the plot, an estimated percentage of species composition per plot, and an estimated percent ground cover. Visual inspection was used to estimate percent ground cover for each plant species using a vertical projection of the foliage of each species within the quadrat.

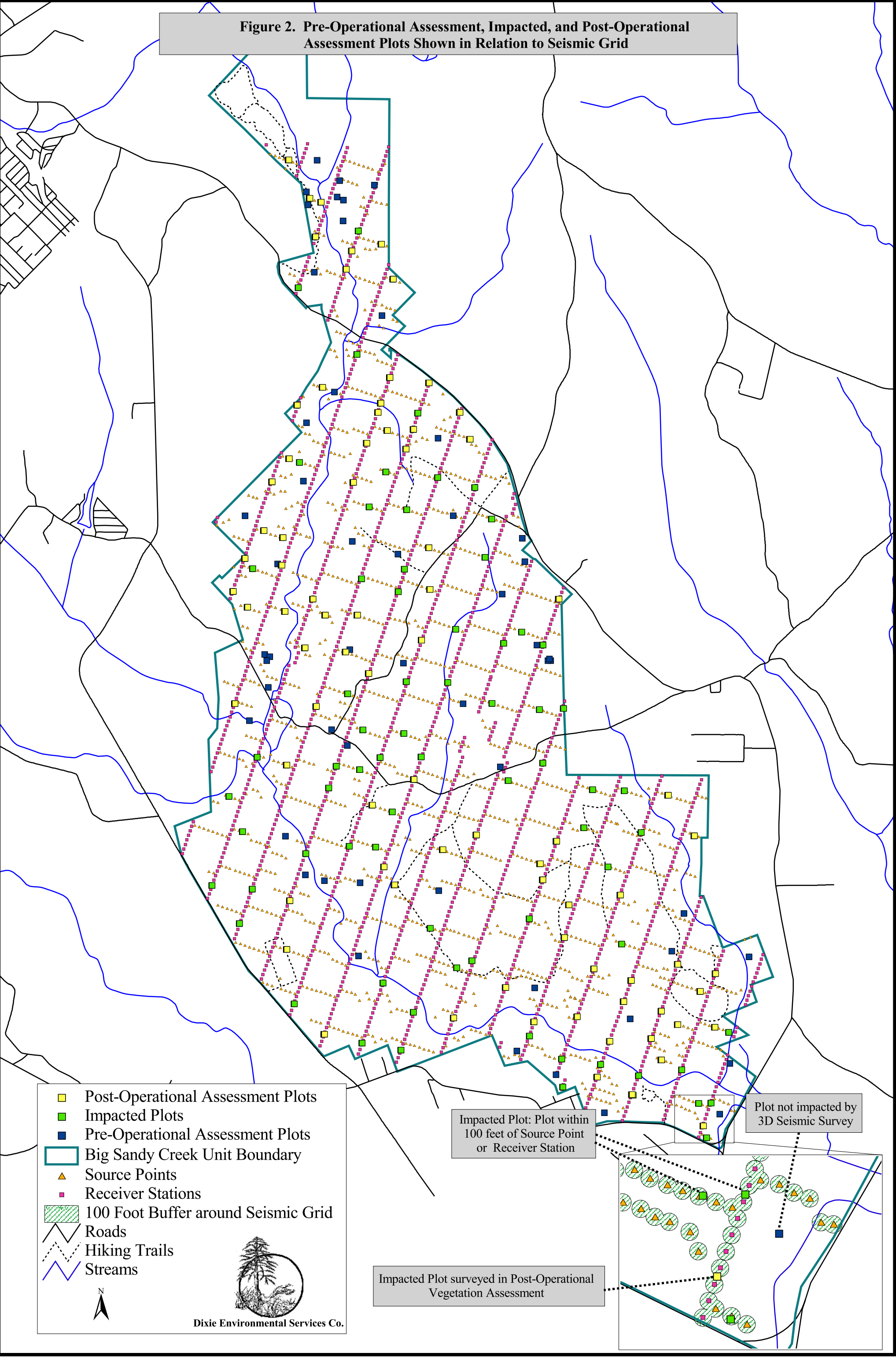
Post-Operational Vegetation Assessment

Sample Design

One hundred and fifty (150) of the 203 sample plots surveyed in the 2003 pre-operational vegetation assessment intersected the final seismic grid of receiver and source lines, which included the source points and receiver stations, as well as the 100-foot (30.48m) travel corridor along the grid. These plots were termed “impacted plots” to differentiate them from the other plots that did not fall within the final grid (**Figure 2**). Of the 150 impacted plots, sixty-nine (69) contained data on the herbaceous layer.

A post-operational assessment sampling plan, which accounted for the range of impacted plots within each of the ten previously determined alliances, was designed by DESCO. There was an abundance of impacted plots present in some of the larger alliances, while there were few found in the smaller alliances.

Figure 2. Pre-Operational Assessment, Impacted, and Post-Operational Assessment Plots Shown in Relation to Seismic Grid



Less than ten sample plots were surveyed during the Pre-Operational Vegetation Assessment in the following alliances:

- *Fraxinus pennsylvanica* - *Ulmus Americana* – *Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance
- *Magnolia virginiana* - *Nyssa biflora* - (*Quercus laurifolia*) Saturated Forest Alliance
- *Nyssa (aquatica, biflora, ogeche)* Floodplain Seasonally Flooded Forest Alliance
- *Nyssa aquatica* – (*Taxodium distichum*) Semi-Permanently Flooded Forest Alliance
- *Sparganium americanum* Seasonally Flooded Herbaceous Alliance
- *Paspalum notatum* Herbaceous Alliance
- *Cyrilla racemiflora* - *Ilex coriacea* - (*Cliftonia monophylla*) Saturated Shrubland Alliance

It would have been advantageous to survey all impacted plots within the above-listed seven uncommon BSCU alliances and survey 50% of the remaining three alliances, which contained an abundance of impacted plots. However, some of the original plot markers were missing from burning activities, floods, or for unexplained reasons. A total of 79 plots were surveyed in order to assess impacts to each of the ten previously determined alliances. All locatable herbaceous plots in the uncommon alliances and approximately 50% of the herbaceous plots in the more abundant alliances were surveyed. (Table 2).

Table 2. Completed Plots in each Alliance by Vegetation Layer		
Alliance	Completed Plots in Post-Operational Vegetation Assessment	
	Woody Plots	Herbaceous Plots
<i>Nyssa aquatica</i> – <i>Taxodium distichum</i> Semi-permanently Flooded Forest Alliance	6	4
<i>Fraxinus pennsylvanica</i> - <i>Ulmus americana</i> - <i>Celtis (occidentalis, laevigata)</i> Temporarily Flooded Forest Alliance	1	1
<i>Quercus alba</i> - (<i>Quercus nigra</i>) Seasonally Flooded Forest Alliance	9	4
<i>Quercucus (laurifolia, phellos)</i> Forest Alliance	23	18

Table 2. Completed Plots in each Alliance by Vegetation Layer		
Alliance	Completed Plots in Post-Operational Vegetation Assessment	
	Woody Plots	Herbaceous Plots
<i>Magnolia virginiana</i> - <i>Nyssa biflora</i> - (<i>Quercus laurifolia</i>) Saturated Forest Alliance	2	2
<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>) Saturated Shrubland Alliance	3	1
<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i> Forest Alliance	29	12
<i>Nyssa (aquatica, biflora, ogeche)</i> Floodplain Seasonally Flooded Forest Alliance	6	5
<i>Paspalum notatum</i> Herbaceous Alliance	0	1
<i>Sparganium americanum</i> Seasonally Flooded Herbaceous Alliance	0	0
Total	79	48

During the April 8, 2005 meeting with BTNP personnel, the subject of 2004 prescribed burns arose, as they had potential to impact the number of plots DESCO surveyed in 2005. Sample plots located within burn compartments are indicated in **Figure 3**. The potentially burned plots were identified and were handled accordingly in the field. For example, if a particular plot could not be found, another plot within that alliance was surveyed. For a complete breakdown per alliance, see **Table 3**.

Table 3. Plots Potentially Affected By 2004 Prescribed Burns		
Alliance	Plots Potentially Burned	Herb Plots Potentially Burned
<i>Nyssa aquatica</i> – <i>Taxodium distichum</i> Semi-permanently Flooded Forest Alliance	0	0
<i>Fraxinus pennsylvanica</i> - <i>Ulmus americana</i> - <i>Celtis (occidentalis, laevigata)</i> Temporarily Flooded Forest Alliance	0	0
<i>Quercus alba</i> - (<i>Quercus nigra</i>) Seasonally Flooded Forest Alliance	2	1
<i>Quercus (laurifolia, phellos)</i> Forest Alliance	11	4

Table 3. Plots Potentially Affected By 2004 Prescribed Burns		
Alliance	Plots Potentially Burned	Herb Plots Potentially Burned
<i>Magnolia virginiana</i> - <i>Nyssa biflora</i> - (<i>Quercus laurifolia</i>) Saturated Forest Alliance	0	0
<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>) Saturated Shrubland Alliance	1	0
<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i> Forest Alliance	36	8
<i>Nyssa (aquatica, biflora, ogeche)</i> Floodplain Seasonally Flooded Forest Alliance	0	0
<i>Paspalum notatum</i> Herbaceous Alliance	1	1
<i>Sparganium americanum</i> Seasonally Flooded Herbaceous Alliance	0	0
Total	51	14

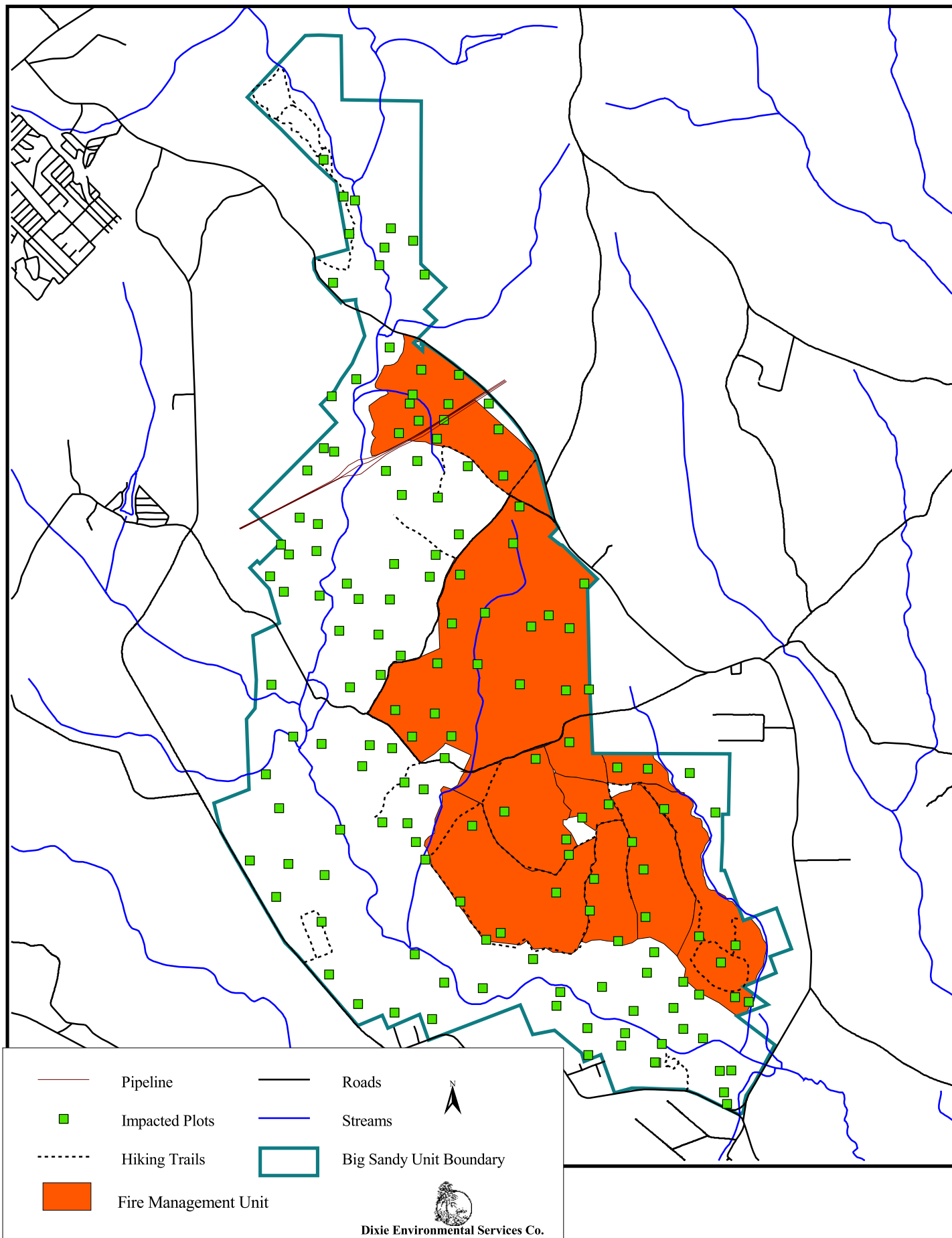
Sampling Methodology

Post-operational vegetation assessment sampling was conducted using the same methodology as that of the Pre-Operational Vegetation Assessment. Each of the 250m² and 25m² plots was measured from its center point, which was indicated by a marked PVC pole established during the Pre-Operational Vegetation Assessment. The azimuth and distance from the center pole of each of the ten randomly selected 1m² herbaceous subplots were recorded during the pre-operational assessment. In as much as possible, the azimuth and distance of each of the subplots enabled the original sample subplots to be located.

DESCO retained the services of plant taxonomist Dr. Stanley Jones for both the pre- and post-operational vegetation assessments. DESCO gained additional insight from plant taxonomist Dr. Larry Brown during the post-operational assessment.

Figure 3

Figure 3. Post-Operational Assessment Plots in Relation to Fire Management Units Burned in Summer 2004 in the Big Sandy Creek Unit, BTNP



Data Management

The pre-operational data of the impacted plots that were sampled during the post-operational assessment are compared to post-operational data. Each data set was reviewed, prior to comparison, for species name consistency and format abnormalities.

Data Analysis Goals

The objectives of impact analyses were as follows:

1. To determine the amount of change in the herbaceous layer by measuring percent cover per alliance and per species within each alliance. DESCO performed ecological analyses to determine the following species indices within each alliance:
 - Frequency
 - Relative Frequency
 - Dominance
 - Relative Dominance
 - Importance Value
 - Relative Importance Value
2. To determine the amount of change in the shrub layer at the alliance level and per species within each alliance by measuring vegetation with a diameter of 0.5-2.4cm. Ecological analyses were used to determine the following:
 - Frequency
 - Relative Frequency
 - Density
 - Relative Density
 - Dominance
 - Relative Dominance
 - Importance Value
 - Relative Importance Value

3. To determine the amount of change in the midstory layer at the alliance level and per species within each alliance by measuring trees with a dbh of 2.4-12cm. Ecological analyses were used to determine the following species indices within each alliance:
 - Frequency
 - Relative Frequency
 - Density
 - Relative Density
 - Dominance
 - Relative Dominance
 - Importance Value
 - Relative Importance Value
4. To confirm that the overstory layer did not change at the alliance level, nor species composition within each alliance, as a result of seismic impacts by measuring trees with diameters greater than 12cm. Ecological analyses were used to determine the following species indices within each alliance:
 - Frequency
 - Relative Frequency
 - Density
 - Relative Density
 - Dominance
 - Relative Dominance
 - Importance Value
 - Relative Importance Value

Natural occurrences could have affected some individuals within sample plots. Notation during the field assessment was made of any damages that were observed and possible explanation for the damages within the discussion section of this report were developed.

5. To measure changes in the presence of exotic and noxious species by analyzing changes in Importance Values of the species within each plot and alliance between the two years of assessment.



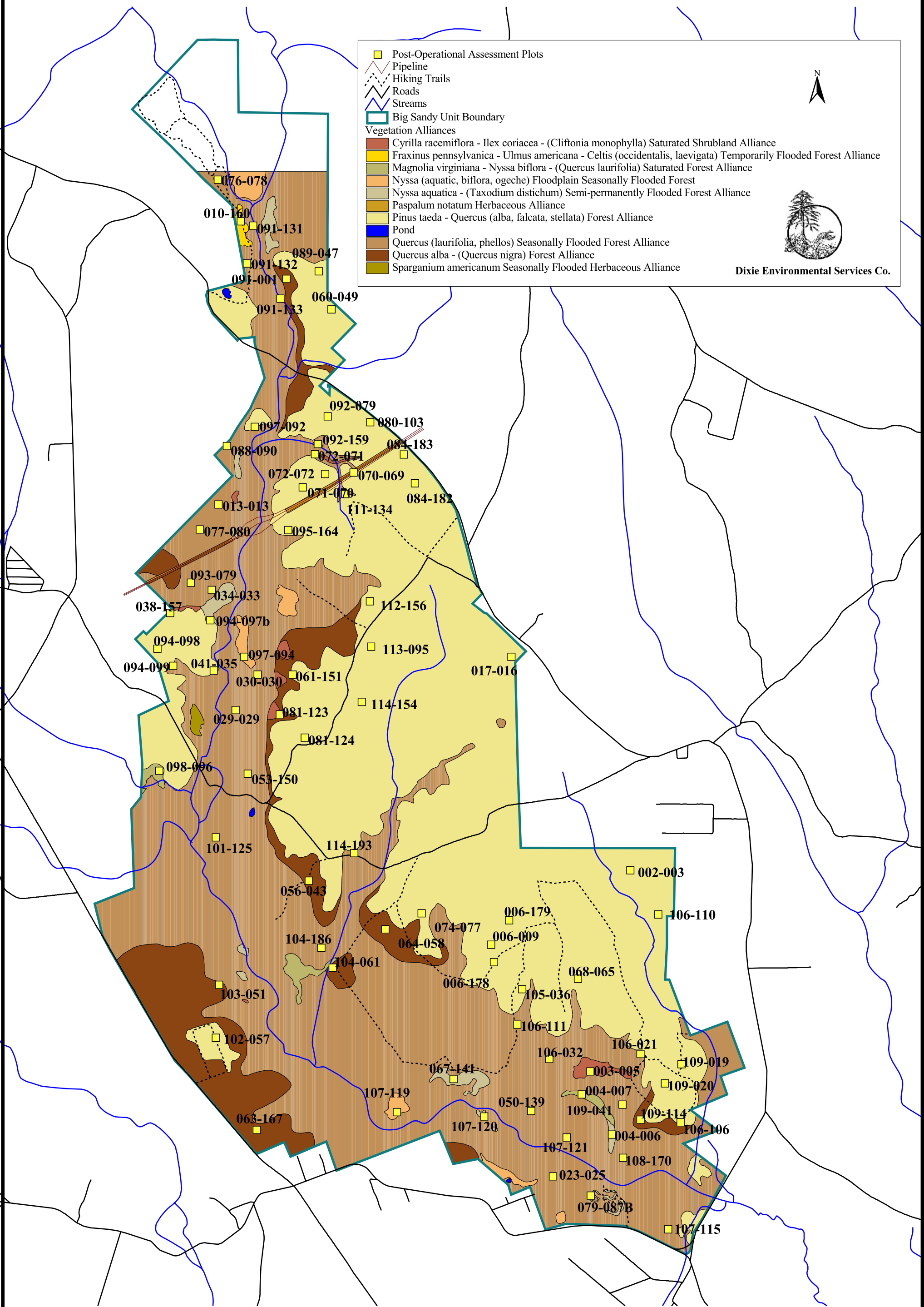
RESULTS

Overall analyses of data of all BSCU alliances, grouped together as a whole, are presented first; followed by individual data for each alliance, presented in the same order as it appeared in *Big Thicket National Preserve Pre-Operational Assessment of Vegetation in the Big Sandy Creek Unit, Polk County, Texas* (PBS&J, 2003). Each sub-section presents data in the same organizational template, with post-operational assessment data presented prior to pre-operational assessment data. The first paragraph contains the alliance area in hectares (ha), number of plots, area sampled, and total density and basal area (dominance) of woody vegetation, as well as the number of plots and area sampled for herbaceous vegetation. The next couple of paragraphs within each section contain the woody and herbaceous ecological indices. The remaining paragraphs of each section display and compare the density and basal area (dominance) of each stratum, as well as the dominant species present during each of the vegetation assessments.

Overall Alliance Data

Seventy-nine (79) of the original 201 sample plots were re-surveyed during the post-operational vegetation assessment (**Figure 4**). The plots were located and positioned in the same locations as those sampled during the pre-operational assessment. See **Appendix A** for a complete plot summary and **Appendix B** for a complete list of species documented in the Big Sandy Creek Unit. The seventy-nine 10m x 25m (250m²) plots covered an area of 1.975 ha. One hundred and ten (110) species of woody vegetation were encountered within these plots. Four hundred and eighty (480) 1m x 1m (1m²) plots were sampled for herbaceous vegetation within the seventy-nine 250m² plots. The 480 1m² plots covered an area of 0.048 ha. Three hundred seven (307) species of plants were recorded in the herbaceous sample plots. The post-operational data show there are 5,355 woody plants per ha, yielding 35.9m² per ha of basal area for all three woody strata. The pre-operational data indicate there were 3,284 woody plants per ha, yielding 46.68m² per ha of basal area for all three woody strata.

Figure 4. Sample Plots in the Post-Operational Vegetation Assessment in the Big Sandy Creek Unit, BTNP



Post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.106, Pielou's Evenness Index (E') at 0.661, and a richness value of 110 species. Pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') was 3.107, Pielou's Evenness Index (E') at 0.685, and a richness value of 93 species. Post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 4.79, Pielou's Evenness Index (E') at 0.836, and a richness value of 307 species. Pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 4.871, Pielou's Evenness Index (E') at 0.841, and a richness value of 328 species recorded within the plots. A summary of the post-operational vegetation assessment data, as well as a comparison of the data with pre-operational data collected for the same seventy-nine sample plots is contained in **Table 4**.

Table 4. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for All Alliances within the Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	79	79
Area Sampled (ha)	1.925	1.925
Number of Species Recorded Within Plots (Richness)	93	110
Overall Species Evenness	0.685	0.661
Overall Species Diversity	3.107	3.106
Herbaceous Vegetation²		
Number of Sample Plots	480	480
Area Sampled (ha)	0.048	0.048
Number of Species Recorded Within Plots (Richness)	328	307
Overall Species Evenness	0.841	0.836
Overall Species Diversity	4.871	4.79

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

Density and dominance (basal area) increased in the shrub layer, though similar values persisted for the midstory and overstory layers in all combined alliances. On average, data showed there were 433 individual trees per ha, yielding 31.21m² per ha of basal area within the overstory stratum. The midstory stratum averaged 1,483 woody plants per ha, yielding 4.0m² per ha of basal area. The shrub stratum, on average, contained 3,328 woody plants per ha, yielding 0.28m² per ha of basal area. In the pre-operational assessment, there were 456 trees per ha, yielding 42.24m² per ha of basal area within the overstory stratum. The pre-operational midstory stratum averaged 1,579 woody plants per ha, yielding 4.01m² per ha of basal area. The pre-operational

shrub stratum, on average, contained 1,228 woody plants per ha, yielding 0.14m² per ha of basal area. Density and dominance for each of the three strata, as well as the overall total for woody vegetation is displayed in **Table 5**.

Table 5. Summary of Woody Strata¹ Vegetation Analyses in All Alliances for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Basal Area (m² per ha)
Post-Operational		
Shrub	3,328	0.28
Midstory	1,483	4.0
Overstory	433	31.21
Overall Total	5,355	35.9
Pre-Operational²		
Shrub	1,228	0.14
Midstory	1,579	4.01
Overstory	452	42.24
Overall Total	3,284	46.68

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

A summary and comparison, by alliance, of post-operational and pre-operational ecological indices is contained in **Table 6**. A comparison of the overall data show that the pre-operational and post-operational indices are similar and shows very little change in the BSCU as a whole.

During the pre-operational vegetation sampling and mapping program, ten vegetation alliances were identified and mapped. During the seismic survey, neither receiver nor source lines were placed within the *Sparganium americanum* Seasonally Flooded Herbaceous Alliance. Without foot or drill traffic, this small alliance (4.8 ha or 11.86 ac) was not impacted by the seismic survey. This alliance was not re-sampled during the post-operational vegetation assessment. The following paragraphs are the results of the vegetation analysis of the remaining nine alliances, which were impacted by the seismic survey. The data are presented on the alliance level. Herbaceous data on the species level for each alliance are not reported or discussed in these sections, but summarized in **Appendix C**, with the exception of the *Paspalum notatum* Herbaceous Alliance.

Table 6. Summary and Comparison by Alliance of the Pre- and Post-Operational Ecological Indices Within the Big Sandy Creek Unit, Big Thicket National Preserve												
Alliance	Pre-Operational						Post-Operational					
	Diversity		Evenness		Richness		Diversity		Evenness		Richness	
	Herb	Woody	Herb	Woody	Herb	Woody	Herb	Woody	Herb	Woody	Herb	Woody
<i>Nyssa aquatica</i> – <i>Taxodium distichum</i> Semi-permanently Flooded Forest Alliance	4.155	2.902	0.923	0.837	90	32	3.984	2.859	0.917	0.825	77	32
<i>Fraxinus pennsylvanica</i> - <i>Ulmus americana</i> - <i>Celtis (occidentalis, laevigata)</i> Temporarily Flooded Forest Alliance	3.488	0.336	0.92	0.173	42	7	3.453	0.461	0.924	0.237	42	7
<i>Quercus alba</i> - (<i>Quercus nigra</i>) Seasonally Flooded Forest Alliance	3.634	2.492	0.891	0.695	59	36	3.845	2.253	0.899	0.607	72	41
<i>Quercus (laurifolia, phellos)</i> Forest Alliance	4.511	2.818	0.868	0.706	181	54	4.32	2.977	0.869	0.719	144	63
<i>Magnolia virginiana</i> - <i>Nyssa biflora</i> - (<i>Quercus laurifolia</i>) Saturated Forest Alliance	3.355	1.709	0.903	0.57	41	20	3.756	1.867	0.929	0.604	57	22
<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>) Saturated Shrubland Alliance	3.187	2.252	0.912	0.709	33	24	2.881	1.766	0.919	0.542	23	26
<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i> Forest Alliance	3.775	2.273	0.837	0.584	91	49	3.776	2.433	0.846	0.594	87	60
<i>Nyssa (aquatica, biflora, ogeche)</i> Floodplain Seasonally Flooded Forest Alliance	3.932	2.418	0.917	0.782	73	22	3.982	2.87	0.911	0.852	79	29
<i>Paspalum notatum</i> Herbaceous Alliance	3.116	NA	0.891	NA	33	NA	3.064	NA	0.91	NA	29	NA
Overall Big Sandy Unit	4.871	3.107	0.841	0.685	328	93	4.79	3.106	0.836	0.661	307	110

Herbaceous layer data were not scrutinized as closely because changes in the dominant species within the herbaceous layer do not provide the overall view of the alliance and have the potential to vary far greater than the woody layers over time. In addition, with the exceptions of the *Sparganium americanum* Seasonally Flooded Herbaceous Alliance and the *Paspalum notatum* Herbaceous Alliance, all alliances within the BSCU are based off of the dominant woody vegetation.

***Nyssa aquatica* – (*Taxodium distichum*) SEMI-PERMANENTLY FLOODED FOREST ALLIANCE**

Nyssa aquatica – (*Taxodium distichum*) Semi-Permanently Flooded Forest Alliance encompasses 43.63 ha (107.71 ac) of the BSCU. This alliance occurs as scattered isolated units of limited extent within the floodplain of Big Sandy Creek. Six 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.15 ha. Thirty-two species of woody plants (trees and shrubs) were recorded in these plots. The data show there are 2,073 woody plants per ha, yielding 62.4m² per ha of basal area for all three woody strata. The data show there were 2,058 woody plants per ha, yielding 207.9m² per ha of basal area for all three woody strata in the pre-operational assessment. Fifty 1m² plots, within five of the six, 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.005 ha. Seventy-seven species of ground layer vegetation were recorded within these fifty 1m² plots.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.859, Pielou's Evenness Index (E') at 0.825, and a richness value of 32 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.902, Pielou's Evenness Index (E') at 0.837, and a richness value of 32 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.984, Pielou's Evenness Index (E') at 0.917, and a richness value of 77 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 4.155, Pielou's Evenness Index (E') at 0.923, and a richness value of 90 species recorded within the plots.

A typical plot in this alliance is illustrated in **Photo 1, Appendix D**. A comparison of the pre-operational and post-operational data for the *Nyssa aquatica* – (*Taxodium distichum*) Semi-Permanently Flooded Forest Alliance (**Table 7**) shows the data to be similar within this alliance except for the herbaceous layer, which is expected to have the greatest variation from one year to the next.

Table 7. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Nyssa aquatica</i> – (<i>Taxodium distichum</i>) Semi-Permanently Flooded Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	6	6
Area Sampled (ha)	0.15	0.15
Number of Species Recorded Within Plots (Richness)	32	32
Overall Species Evenness	0.837	0.825
Overall Species Diversity	2.902	2.859
Herbaceous Vegetation²		
Number of Sample Plots	50	50
Area Sampled (ha)	0.005	0.005
Number of Species Recorded Within Plots (Richness)	90	77
Overall Species Evenness	0.923	0.917
Overall Species Diversity	4.155	3.984

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The overstory stratum within this alliance exhibits a total basal area of 58.98m² per ha, with 620 trees per ha. The pre-operational data show a total basal area of 204.97m² per ha, with 633.33 trees per ha (**Table 8**). The overstory stratum in this alliance is dominated by water tupelo (*Nyssa aquatica*), which is composed of 146.67 trees per ha. Other important species listed in the order of importance value in the overstory stratum include swamp blackgum (*Nyssa biflora*), bald cypress (*Taxodium distichum*), sweetgum (*Liquidambar styraciflua*), and green ash (*Fraxinus pennsylvanica*). The data collected during the pre-operational vegetation assessment indicated the same four species of trees as the dominant species. The only difference being that sweetgum was the dominant tree in the overstory class at the time of the pre-operational assessment, with 60 trees per ha. The overall species richness, evenness, and diversity measurements are comparatively the same in both data sets. Possible reasons for changes in the importance values and dominance in the overstory stratum are provided in the **Discussion** section.

The midstory stratum within this alliance contained an average of 813.33 individual trees per ha, yielding 3.37m² of basal area per ha. During the pre-operational analysis, the midstory contained 746.67 individual trees per ha, which yielded 2.84m² of basal area per ha (**Table 8**). The midstory stratum is dominated by green ash, with other important species including swamp blackgum, American hornbeam (*Carpinus caroliniana*), and American holly (*Ilex opaca*). During the pre-operational analysis the midstory was dominated by American hornbeam, green ash, swamp blackgum, and water tupelo, respectively.

Table 8. Summary of Woody Strata¹ Vegetation Analyses in the <i>Nyssa aquatica</i> – (<i>Taxodium distichum</i>) Semi-Permanently Flooded Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m² per ha)
Post-Operational		
Shrub	640	0.05
Midstory	813.33	3.37
Overstory	620	58.98
Total	2,073	62.4
Pre-Operational²		
Shrub	1,200	0.09
Midstory	746.67	2.84
Overstory	633.33	204.97
Total	2,580	207.9

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 640 individual woody plants per ha, yielding 0.05m² of basal area per ha. During the pre-operational analysis, the shrub stratum contained 1,200 individual woody plants per ha, which yielded 0.09m² of basal area per ha (**Table 8**). Sebastian bush (*Sebastiania fruticosa*) was the dominant species. Other important species present in the shrub stratum of this alliance included sweetgum, possumhaw viburnum (*Viburnum nudum*), two vine species, Alabama supplejack (*Berchemia scandens*), and Virginia creeper (*Parthenocissus quinquefolia*), as well as swamp bayberry (*Myrica heterophylla*). The dominant species present during the pre-operational effort were possumhaw viburnum, swamp blackgum, Sebastian bush, and wax myrtle.

***Fraxinus pennsylvanica* – *Ulmus americana*- *Celtis (occidentalis, laevigata)* TEMPORARILY
FLOODED FOREST ALLIANCE**

Fraxinus pennsylvanica – *Ulmus americana* - *Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance encompasses approximately 5.89 ha (14.55 ac) of the BSCU. This Alliance is located on the northern reach of Big Sandy Creek within the floodplain of the creek. A single 25m x 10m rectangular plot was sampled for woody vegetation, equaling an area of 0.025 ha. Seven species of woody plants were recorded in these plots. Ten 1m² plots within the 250m² plot were sampled for herbaceous vegetation, equaling an area of 0.001 ha. Forty-two species of ground layer vegetation were recorded within these ten 1m² plots. The post-operational data show there are 4,280 woody plants per ha, yielding 14.87m² per ha of basal area for all three woody strata. The pre-operational data show there were 5,240 woody plants per ha, yielding 11.4m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 0.461, Pielou's Evenness Index (E') at 0.237, and a richness value of seven (7) species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 0.336, Pielou's Evenness Index (E') at 0.173, and a richness value of seven (7) species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.453, Pielou's Evenness Index (E') at 0.924, and a richness value of 42 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.438, Pielou's Evenness Index (E') at 0.92, and a richness value of 42 species recorded within the plots.

A typical plot in this alliance is shown in **Photo 2, Appendix D**. Pre- and post-operational data for the *Fraxinus pennsylvanica* – *Ulmus americana* - *Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance are comparatively the same (**Table 9**), with a slight increase in post-project species diversity.

Table 9. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Fraxinus pennsylvanica</i> – <i>Ulmus americana</i>- <i>Celtis (occidentalis, laevigata)</i> Temporarily Flooded Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	1	1
Area Sampled (ha)	0.025	0.025
Number of Species Recorded Within Plots (Richness)	7	7
Overall Species Evenness	0.173	0.237
Overall Species Diversity	0.336	0.461
Herbaceous Vegetation²		
Number of Sample Plots	10	10
Area Sampled (ha)	0.001	0.001
Number of Species Recorded Within Plots (Richness)	42	42
Overall Species Evenness	0.92	0.92
Overall Species Diversity	3.438	3.453

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The overstory stratum within this alliance exhibits a total basal area of 5.8m² per ha, with 320 trees per ha. In the pre-operational data, the overstory stratum within this alliance exhibited a total basal area of 1.15m² per ha, with 80 trees per ha (**Table 10**). The overstory stratum in this alliance is dominated by green ash, which is composed of 240 trees per ha. Other important species, listed in the order of dominance in the overstory stratum, include slippery elm (*Ulmus rubra*), and sweetgum. In the pre-operational vegetation data of the same plots sampled in 2005, only slippery elm and sweetgum were large enough to be included in this class.

The midstory within this alliance contains an average of 3,960 individual trees per ha, yielding 9.07m² of basal area per ha. During the pre-operational analysis the midstory contained 4,640 individual trees per ha, which yielded 8.82m² of basal area per ha. The midstory stratum is dominated by green ash with other important species including sweetgum, water hickory (*Carya aquatica*), and slippery elm. During the pre-operational analysis, the midstory was dominated by green ash, sweetgum, Texas sugarberry (*Celtis laevigata*), and slippery elm.

Table 10. Summary of Woody Strata¹ Vegetation Analyses in the *Fraxinus pennsylvanica* – *Ulmus americana* - *Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve

	Density (Individual Trees per ha)	Dominance (m ² per ha)
Post-Operational		
Shrub	NR ³	NR
Midstory	3,960	9.07
Overstory	320	5.8
Total	4,280	14.87
Pre-Operational²		
Shrub	400	0.07
Midstory	4,640	8.82
Overstory	80	1.15
Total	5,240	11.4

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

³ NR = Not recorded

The shrub stratum of this alliance did not contain any measurable shrubs within the 5m x 5m (25m²) plot during the post-operational assessment. During the pre-operational analysis, data indicated the presence of 400 individual woody species per ha, which yielded 0.07m² of basal area per ha in the shrub stratum. Green ash was the only measurable species recorded within the shrub stratum during the pre-operational vegetation assessment.

***Quercus alba* – (*Quercus nigra*) FOREST ALLIANCE**

Quercus alba – (*Quercus nigra*) Forest Alliance encompasses approximately 422.89 ha (1,045 ac) of the BSCU. This alliance occurs on the lower-mid slope of the landscape. Nine 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.225 ha. Forty-one species of woody plants (trees and shrubs) were recorded in these plots. Forty 1m x 1m plots, within four of the nine 250m² plots, were sampled for herbaceous vegetation, equaling an area of 0.004 ha. Seventy-two (72) species of ground layer vegetation were recorded within these 40 1m² plots. The data show there are 5,573 woody plants per ha, yielding 30.9m² per ha of basal area for all three woody strata. The pre-operational data show there were 2,911 woody plants per ha, yielding 29.87m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.253, Pielou's Evenness Index (E') at 0.607, and a richness value of 41 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.492, Pielou's Evenness Index (E') at 0.695, and a richness value of 36 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.845, Pielou's Evenness Index (E') at 0.899, and a richness value of 72 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.634, Pielou's Evenness Index (E') at 0.891, and a richness value of 59 species recorded within the plots.

A typical plot in this alliance is shown in **Photo 3, Appendix D**. Overall species richness, evenness, and diversity measurements are similar from the pre-operational vegetation assessment to the post-operational assessment in the *Quercus alba* – (*Quercus nigra*) Forest Alliance (**Table 11**), with slight decreases in the evenness and diversity of woody species and slight increases in richness, evenness, and diversity of herbaceous species.

Table 11. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Quercus alba</i> – (<i>Quercus nigra</i>) Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	9	9
Area Sampled (ha)	0.225	0.225
Number of Species Recorded Within Plots (Richness)	36	41
Overall Species Evenness	0.695	0.607
Overall Species Diversity	2.492	2.253
Herbaceous Vegetation²		
Number of Sample Plots	40	40
Area Sampled (ha)	0.004	0.004
Number of Species Recorded Within Plots (Richness)	59	72
Overall Species Evenness	0.891	0.899
Overall Species Diversity	3.634	3.845

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The data for the overstory stratum within this alliance indicate there are 413.34 individual trees per ha, which yield a total basal area of 27.38m² per ha. The pre-operational data for the overstory stratum within this alliance indicated there are 417.78 individual trees per ha, which yield a total basal area of 26.8m² per ha (**Table 12**). The overstory stratum in this alliance is dominated by white oak (*Quercus alba*), which is composed of 124.44 trees per ha. Other important species, listed in the order of dominance in the overstory stratum, include sweetgum, blackgum (*Nyssa sylvatica*), and loblolly pine (*Pinus taeda*). Pre-operational assessment data indicated the same dominant trees, in the same order of dominance.

The midstory stratum within this alliance contains an average of 1,320 individual trees per ha, yielding 3.05m² of basal area per ha. During the pre-operational analysis, the midstory contained 1,284 individual trees per ha, which yielded 2.86m² of basal area per ha. The midstory stratum is dominated by yaupon holly, with other important species including blackgum, loblolly pine, and eastern hop hornbeam (*Ostrya virginiana*). During the pre-operational analysis, the midstory was dominated by yaupon holly, blackgum, white oak, and American hornbeam.

Table 12. Summary of Woody Strata¹ Vegetation Analyses in the <i>Quercus alba</i> – (<i>Quercus nigra</i>) Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m² per ha)
Post-Operational		
Shrub	3,826	0.30
Midstory	1,320	3.05
Overstory	413.34	27.38
Total	5,573	30.9
Pre-Operational²		
Shrub	1,204	0.16
Midstory	1,284	2.86
Overstory	417.78	26.8
Total	2,911	29.87

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 3,826 individual woody species per ha, yielding 0.30m² of basal area per ha. During the pre-operational analysis, the shrub stratum contained 1,204 individual woody species per ha, which yielded 0.16m² of basal area per

ha. In the shrub stratum, yaupon holly was the dominant species. Other important species present in the shrub stratum of this alliance included red bay (*Persea palustris*), eastern hop hornbeam, and American holly. The dominant species present during the pre-operational assessment were yaupon holly, red bay, sweetgum, and American hornbeam.

***Quercus (laurifolia, phellos)* SEASONALLY FLOODED FOREST ALLIANCE**

Quercus (laurifolia, phellos) Seasonally Flooded Forest alliance encompasses approximately 2,590.66 ha (6,399 ac) of the BSCU. This alliance occurs within the floodplain of Big Sandy Creek. Twenty-three 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.575 ha. Fifty-four species of woody plants (trees and shrubs) were recorded in these plots. One hundred eighty 1m x 1m plots, within 18 of the 24, 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.018 ha. One hundred forty-four species of ground layer vegetation were recorded within these one hundred eighty 1m² plots. The data show there are 5,335 woody plants per ha, yielding 32.69m² per ha of basal area for all three woody strata. The pre-operational data show there were 3,641 woody plants per ha, yielding 34.82m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.977, Pielou's Evenness Index (E') at 0.719, and a richness value of 63 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.818, Pielou's Evenness Index (E') at 0.706, and a richness value of 54 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 4.32, Pielou's Evenness Index (E') at 0.869, and a richness value of 144 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 4.511, Pielou's Evenness Index (E') at 0.868, and a richness value of 181 species recorded within the plots.

A typical plot in this alliance is exhibited in **Photo 4, Appendix D**. The overall species richness, evenness, and diversity measurements of the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance are similar from the pre-operational vegetation assessment to the post-operational assessment (**Table 13**), with a slight increase in the ecological parameters for the woody layers, but a slight decrease in the parameters for the herbaceous layer.

Table 13. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Quercus (laurifolia, phellos)</i> Seasonally Flooded Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	23	23
Area Sampled (ha)	0.575	0.575
Number of Species Recorded Within Plots (Richness)	54	63
Overall Species Evenness	0.706	0.719
Overall Species Diversity	2.818	2.977
Herbaceous Vegetation²		
Number of Sample Plots	18	18
Area Sampled (ha)	0.018	0.018
Number of Species Recorded Within Plots (Richness)	181	144
Overall Species Evenness	0.868	0.869
Overall Species Diversity	4.511	4.32

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The overstory stratum of this alliance contained 390 trees per ha, yielding 28.6m² per ha basal area (**Table 14**). During the pre-operational analysis, the overstory stratum contained 424 individual trees per ha, 30.94m² per ha of basal area. The overstory stratum in this alliance was dominated by sweetgum (67.8 trees per ha). Other overstory trees, listed in order of importance, include loblolly pine, laurel oak (*Quercus laurifolia*), and American beech (*Fagus grandifolia*). The same trees were dominant in the Pre-operational assessment as in the post-operational assessment, in the same order of dominance.

The midstory stratum contained an average of 1,259 individual trees per ha, 3.42m² of basal area per ha. During the pre-operational analysis, the midstory contained 1,263 individual trees per ha, which yielded 3.46m² of basal area per ha. The midstory stratum was dominated by sweetgum, with other important species including yaupon holly, American holly, and eastern hop hornbeam.

During the pre-operational analysis, the midstory was dominated by yaupon holly, American holly, sweetgum, and American hornbeam.

Table 14. Summary of Woody Strata¹ Vegetation Analyses in the <i>Quercus (laurifolia, phellos)</i> Seasonally Flooded Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m² per ha)
Post-Operational		
Shrub	3,657	0.28
Midstory	1,259	3.42
Overstory	390	28.6
Total	5,335	32.69
Pre-Operational²		
Shrub	1,932	0.18
Midstory	1,263	3.46
Overstory	424	30.94
Total	3,641	34.82

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 3,657 shrubs per ha, yielding 0.28m² of basal area per ha. During the pre-operational analysis, the shrub class had 1,932 shrubs per ha, yielding 0.18m² of basal area per ha. Yaupon holly was the dominant species. Other important species present in the shrub stratum of this alliance included giant river cane (*Arundinaria gigantea*), gallberry holly (*Ilex coriacea*), and American holly. The dominant species present during the pre-operational assessment were yaupon holly, red bay, giant river cane, and sweetgum.

***Magnolia virginiana* – *Nyssa biflora* - (*Quercus laurifolia*) SATURATED FOREST ALLIANCE**

Magnolia virginiana – *Nyssa biflora* - (*Quercus laurifolia*) Saturated Forest Alliance encompasses approximately 24.26 ha (59.92 ac) of the BSCU. This alliance occurs within the floodplain of the creek. Two 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.05 ha. Twenty-two (22) species of woody plants (trees and shrubs) were recorded in these plots. Twenty 1m x 1m plots within the two 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.002 ha. Fifty-seven species of ground layer

vegetation were recorded within these 180 1m² plots. The data show there are 6,640 woody plants per ha, yielding 30.92m² per ha of basal area for all three woody strata. The pre-operational data show there were 10,060 woody plants per ha, yielding 28.69m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 1.867, Pielou's Evenness Index (E') at 0.604, and a richness value of 22 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 1.709, Pielou's Evenness Index (E') at 0.57, and a richness value of 20 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.756, Pielou's Evenness Index (E') at 0.929, and a richness value of 57 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.355, Pielou's Evenness Index (E') at 0.903, and a richness value of 41 species recorded within the plots.

A typical plot within this alliance is displayed in **Photo 5, Appendix D**. There was a slight increase in diversity, evenness, and richness in both the woody and herbaceous layers of the *Magnolia virginiana* – *Nyssa biflora* - (*Quercus laurifolia*) Saturated Forest Alliance from the pre-operational assessment to the post-operational assessment (**Table 15**).

Table 15. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Magnolia virginiana</i> – <i>Nyssa biflora</i> - (<i>Quercus laurifolia</i>) Saturated Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	2	2
Area Sampled (ha)	0.05	0.05
Number of Species Recorded Within Plots (Richness)	20	22
Overall Species Evenness	0.57	0.604
Overall Species Diversity	1.709	1.867
Herbaceous Vegetation²		
Number of Sample Plots	20	20
Area Sampled (ha)	0.002	0.002
Number of Species Recorded Within Plots (Richness)	41	57
Overall Species Evenness	0.903	0.929

Table 15. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for *Magnolia virginiana* – *Nyssa biflora* - (*Quercus laurifolia*) Saturated Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve

Overall Species Diversity	3.355	3.756
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¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The data for the overstory stratum within this alliance indicate there are 240 individual trees per ha, which yield a total basal area of 25.27m² per ha (**Table 16**). During the pre-operational analysis, the overstory had 260 individual trees per ha, which yielded 23.43m² of basal area per ha. The overstory stratum in this alliance is dominated by sweet bay magnolia (*Magnolia virginiana*), which is composed of 180 trees per ha. Other important species, listed in the order of dominance in the overstory stratum, include swamp blackgum, blackgum, and loblolly pine. Pre-operational assessment data indicated the dominant species as sweet bay magnolia, swamp blackgum, southern magnolia (*Magnolia grandiflora*), and red bay.

The midstory stratum within this alliance contained an average of 2,180 individual trees per ha, yielding 4.63m² of basal area per ha. During the pre-operational analysis, the midstory had 2,560 individual trees per ha, which yielded 4.2m² of basal area per ha. The midstory stratum is dominated by sweet bay magnolia with other important species including gallberry holly, swamp blackgum, and red bay. During the pre-operational assessment, the midstory was dominated by the same species, except that gallberry holly was the dominant species at the time of the 2003 effort.

Table 16. Summary of Woody Strata¹ Vegetation Analyses in the *Magnolia virginiana* – *Nyssa biflora* - (*Quercus laurifolia*) Saturated Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve

	Density (Individual Trees per ha)	Dominance (m ² per ha)
Post-Operational		
Shrub	4,200	0.74
Midstory	2,180	4.63
Overstory	240	25.27
Total	6,640	30.92
Pre-Operational²		
Shrub	7,220	0.60

Table 16. Summary of Woody Strata¹ Vegetation Analyses in the <i>Magnolia virginiana</i> – <i>Nyssa biflora</i> - (<i>Quercus laurifolia</i>) Saturated Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m² per ha)
Midstory	2,560	4.2
Overstory	260	23.43
Total	10,060	28.49

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 4,200 individual woody species per ha, yielding 0.7388m² of basal area per ha. During the pre-operational analysis, the shrub stratum had 7,220 individual woody species per ha, which yielded 0.60m² of basal area per ha. Gallberry holly was the dominant species present; whereas, southern wax myrtle (*Myrica cerifera*) was the dominant species during the pre-operational assessment. Other important species in the shrub stratum included Texas azalea (*Rhododendron oblongifolium*), southern wax myrtle, and buttonbush (*Cephalanthus occidentalis*). The dominant species present during the pre-operational effort were southern wax myrtle, gallberry holly, Texas azalea, and green ash.

***Cyrilla racemiflora* – *Ilex coriacea* - (*Cliftonia monophylla*) SATURATED SHRUBLAND ALLIANCE**

Cyrilla racemiflora – *Ilex coriacea* - (*Cliftonia monophylla*) Saturated Shrubland Alliance encompasses approximately 23.15 ha (57.18 ac) of the BSCU. This alliance occurs as scattered, isolated units of limited extent within the floodplain of the creek, lower slopes and hillsides. Three 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.075 ha. Twenty-six (26) species of woody plants (trees and shrubs) were recorded in these plots. Ten 1m x 1m plots within one of the three 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.001 ha. Twenty-three species of ground layer vegetation were recorded within these ten 1m² plots. The data show there are 11,279 woody plants per ha, yielding 31.7m² per ha of basal area for all three woody strata. The pre-operational data show there were 3,506 woody plants per ha, yielding 22.07m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 1.766, Pielou's Evenness Index (E') at 0.542, and a richness value of 26 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.252, Pielou's Evenness Index (E') at 0.709, and a richness value of 24 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.881, Pielou's Evenness Index (E') at 0.919, and a richness value (number of species) of 23 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.187, Pielou's Evenness Index (E') at 0.912, and a richness value of 33 species recorded within the plots.

A typical plot in this alliance is presented in **Photo 6, Appendix D**. Overall diversity and evenness decreased from the pre-operational assessment to the post-operational assessment in the *Cyrilla racemiflora* – *Ilex coriacea* - (*Cliftonia monophylla*) Saturated Shrubland Alliance (**Table 17**). Most species within this alliance are classified as shrubs, and thus would be located in the impact zone of seismic activities.

Table 17. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>) Saturated Shrubland Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	3	3
Area Sampled (ha)	0.075	0.075
Number of Species Recorded Within Plots (Richness)	24	26
Overall Species Evenness	0.709	0.542
Overall Species Diversity	2.252	1.766
Herbaceous Vegetation²		
Number of Sample Plots	10	10
Area Sampled (ha)	0.002	0.002
Number of Species Recorded Within Plots (Richness)	33	23
Overall Species Evenness	0.912	0.919
Overall Species Diversity	3.187	2.881

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The data for the overstory stratum within this alliance indicate there are 426 individual trees per ha, which yield a total basal area of 25.42m² per ha (**Table 18**). During the pre-operational analysis, the overstory stratum had 386 individual trees per ha, which yielded 16.48m² of basal area per ha. The overstory stratum in this alliance is dominated by swamp blackgum, which is composed of 80 trees per ha. Other important species listed in the order of dominance in the overstory stratum include sweet bay magnolia, loblolly pine, and sweetgum. Pre-operational assessment data indicated that the dominant species present at the time of the 2003 effort were sweet bay magnolia, swamp blackgum, loblolly pine, and southern red oak (*Quercus falcata*).

The midstory stratum within this alliance contained an average of 2,000 individual trees per ha, yielding 5.24m² of basal area per ha. During the pre-operational analysis, the midstory contained 2,280 individual trees per ha, which yielded 4.93m² of basal area per ha. The midstory is dominated by gallberry holly, with other important species including American holly, red bay, and southern wax myrtle. During the pre-operational analysis, the midstory was dominated by gallberry holly, red bay, sweetgum, and yaupon holly.

Table 18. Summary of Woody Strata¹ Vegetation Analyses in the <i>Cyrilla racemiflora</i> – <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>) Saturated Shrubland Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m² per ha)
Post-Operational		
Shrub	8,799	0.44
Midstory	2,000	5.24
Overstory	426	25.42
Total	11,279	31.7
Pre-Operational²		
Shrub	800	0.21
Midstory	2,280	4.93
Overstory	386	16.48
Total	3,506	22.07

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 8,799 individual woody species per ha, yielding 0.44m² of basal area per ha. During the pre-operational analysis, the shrub stratum contained 800 individual woody species per ha, which yielded 0.21m² of basal area per

ha. Gallberry holly was the dominant species. Other important species present in the shrub stratum of this alliance included American holly, red bay, and southern wax myrtle. The dominant species present during the pre-operational assessment were southern wax myrtle, gallberry holly, farkleberry (*Vaccinium arboreum*), and red bay.

***Pinus taeda* – *Quercus* (*alba*, *falcata*, *stellata*) FOREST ALLIANCE**

Pinus taeda – *Quercus* (*alba*, *falcata*, *stellata*) Forest Alliance encompasses approximately 2340.49 ha (5,781 ac) of the BSCU. This alliance occurs at higher topographic elevations within the unit. Twenty-nine 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.725 ha. Sixty (60) species of woody plants (trees and shrubs) were recorded in these plots. One hundred twenty 1m x 1m plots within the thirty 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.012 ha. Eighty-seven (87) species of ground layer vegetation were recorded within these one hundred twenty 1m² plots. The data show there are 5,546 woody plants per ha, yielding 36.33m² per ha of basal area for all three woody strata. The pre-operational data show there were 2,877 woody plants per ha, yielding 35m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.433, Pielou's Evenness Index (E') at 0.594, and a richness value of 60 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.273, Pielou's Evenness Index (E') at 0.584, and a richness value of 49 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.776, Pielou's Evenness Index (E') at 0.846, and a richness value of 87 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.775, Pielou's Evenness Index (E') at 0.837, and a richness value of 91 species recorded within the plots.

A typical plot within this alliance is portrayed in **Photo 7, Appendix D**. The overall data in the *Pinus taeda* – *Quercus* (*alba*, *falcata*, *stellata*) Forest Alliance are comparatively the same between the pre- and post-operational assessments (**Table 19**).

Table 19. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Pinus taeda</i> – <i>Quercus</i> (<i>alba</i>, <i>falcata</i>, <i>stellata</i>) Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	29	29
Area Sampled (ha)	0.725	0.725
Number of Species Recorded Within Plots (Richness)	49	60
Overall Species Evenness	0.584	0.594
Overall Species Diversity	2.273	2.433
Herbaceous Vegetation²		
Number of Sample Plots	120	120
Area Sampled (ha)	0.012	0.012
Number of Species Recorded Within Plots (Richness)	91	87
Overall Species Evenness	0.837	0.846
Overall Species Diversity	3.775	3.776

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The data for the overstory stratum within this alliance indicate there are 469 individual trees per ha, which yield a total basal area of 30.94m² per ha (**Table 20**). During the pre-operational analysis, the overstory had 481 individual trees per ha, which yielded 29.68m² of basal area per ha. The overstory stratum in this alliance is dominated by loblolly pine, which is composed of 198 trees per ha. Other important species, listed in the order of dominance in the overstory, include short-leaf pine (*Pinus echinata*), sweetgum, and southern red oak. Pre-operational assessment data indicated that the dominant species present during the 2003 effort were loblolly pine, short-leaf pine, sweetgum, and yaupon holly.

The midstory within this alliance contained an average of 1,677 individual trees per ha, yielding 4.55m² of basal area per ha. During the pre-operational analysis, the midstory contained 1,906 individual trees per ha, which yielded 4.85m² of basal area per ha. The midstory stratum is dominated by yaupon holly, with other important species including sweetgum, loblolly pine, and flowering dogwood (*Cornus florida*). During the pre-operational assessment, the midstory was dominated by the same species, in the same order of dominance.

Table 20. Summary of Woody Strata ¹ Vegetation Analyses in the <i>Pinus taeda</i> – <i>Quercus (alba, falcata, stellata)</i> Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m ² per ha)
Post-Operational		
Shrub	3,153	0.30
Midstory	1,677	4.55
Overstory	469	30.94
Total	5,546	36.33
Pre-Operational²		
Shrub	455	0.08
Midstory	1,906	4.85
Overstory	481	29.68
Total	2,877	35

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 3,153 individual woody species per ha, yielding 0.30m² of basal area per ha. During the pre-operational analysis, the shrub stratum contained 455 individual woody species per ha, which yielded 0.08m² of basal area per ha. Yaupon holly was the dominant species. Other important species present in the shrub stratum of this alliance included red bay, red oak, and sweetgum. The dominant species present during the pre-operational assessment were yaupon holly, sweetgum, common greenbrier (*Smilax rotundifolia*), and red bay.

***Nyssa (aquatica, biflora, ogeche)* FLOODPLAIN SEASONALLY FLOODED FOREST ALLIANCE**

Nyssa (aquatica, biflora, ogeche) Floodplain Seasonally Flooded Forest Alliance encompasses approximately 44.05 ha (108.8 ac) of the BSCU. This alliance occurs in the floodplain of the creek. Four 25m x 10m rectangular plots were sampled for woody vegetation, equaling an area of 0.1 ha. Twenty-two (22) species of woody plants (trees and shrubs) were recorded in these plots. Forty 1m x 1m plots within all four 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.004 ha. Seventy-nine species of ground layer vegetation were recorded within these forty 1m² plots. The data show there are 3,480 woody plants per ha, yielding 34.04m² per ha of basal area for all three woody strata. The pre-operational data show there were 2,040 woody plants per ha, yielding 31.82m² per ha of basal area for all three woody strata.

Alliance post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.87, Pielou's Evenness Index (E') at 0.852, and a richness value of 29 species. Alliance pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.418, Pielou's Evenness Index (E') at 0.782, and a richness value of 22 species.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.982, Pielou's Evenness Index (E') at 0.911, and a richness value 79 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.932, Pielou's Evenness Index (E') at 0.917, and a richness value of 73 species recorded within the plots.

A typical plot in this alliance is illustrated in **Photo 8, Appendix D**. The data from the *Nyssa (aquatica, biflora, ogeche)* Floodplain Seasonally Flooded Forest Alliance showed a slight increase in richness, evenness, and diversity of woody vegetation and a slight decrease in evenness and diversity of herbaceous vegetation; however, the ecological indices are relatively similar (**Table 21**).

Table 21. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for the <i>Nyssa (aquatica, biflora, ogeche)</i> Forest Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Woody Vegetation¹	Pre-Operational³	Post-Operational
Number of Sample Plots	4	4
Area Sampled (ha)	0.075	0.075
Number of Species Recorded Within Plots (Richness)	22	29
Overall Species Evenness	0.782	0.852
Overall Species Diversity	2.418	2.87
Herbaceous Vegetation²		
Number of Sample Plots	40	40
Area Sampled (ha)	0.004	0.004
Number of Species Recorded Within Plots (Richness)	73	79
Overall Species Evenness	0.917	0.911
Overall Species Diversity	3.932	3.982

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

³ Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The data for the overstory stratum within this alliance indicate there are 390 individual trees per ha, which yield a total basal area of 29.94m² per ha (**Table 22**). During the pre-operational analysis, the overstory had 440 individual trees per ha, which yielded 27.93m² of basal area per ha. The overstory stratum in this alliance is dominated by sweetgum, which is composed of 50 trees per ha. Other important species, listed in the order of dominance in the overstory, include swamp blackgum, overcup oak (*Quercus lyrata*), and green ash. Pre-operational assessment data indicated that the dominant species present during the 2003 effort were swamp blackgum, American hornbeam, sweetgum, and overcup oak. During the post-operational assessment, sweetgum replaced swamp blackgum as the dominant species. The **Discussion** section explores reasons why dominance could change in the overstory.

The midstory stratum within this alliance contained an average of 1,350 individual trees per ha, yielding 3.78m² of basal area per ha. During the pre-operational analysis, the midstory contained 1,160 individual trees per ha, which yielded 3.47m² of basal area per ha. The midstory stratum is dominated by American hornbeam, with other important species including American cyrilla (*Cyrilla racemiflora*), laurel oak, and yaupon holly. During the pre-operational assessment, the midstory was dominated by American hornbeam, laurel oak, American holly, and yaupon holly.

Table 22. Summary of Woody Strata¹ Vegetation Analyses in the <i>Nyssa (aquatica, biflora, ogeche)</i> Floodplain Seasonally Flooded Forest Alliance for the Big Sandy Creek Unit, Big Thicket National Preserve		
	Density (Individual Trees per ha)	Dominance (m² per ha)
Post-Operational		
Shrub	1,720	0.09
Midstory	1,350	3.78
Overstory	390	29.94
Total	3,480	34.04
Pre-Operational²		
Shrub	410	0.08
Midstory	1,160	3.47
Overstory	440	27.93
Total	2,040	31.82

¹ Woody vegetation was sampled in 10 m X 25 m (250 m²) rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The shrub stratum within this alliance contained an average of 1,720 individual woody species per ha, yielding 0.09m² of basal area per ha. During the pre-operational analysis, the shrub stratum contained 410 individual woody species per ha, which yielded 0.08m² of basal area per ha. Sebastian bush was the dominant species. Other important species present in the shrub stratum of this alliance included eastern hop hornbeam, common sweetleaf (*Symplocos tinctoria*), and two woody vines, Alabama supplejack and muscadine grape (*Vitis rotundifolia*). The dominant species present during the pre-operational assessment were eastern hop hornbeam, American holly, farkleberry, and American cyrilla.

***Paspalum notatum* HERBACEOUS ALLIANCE**

Paspalum notatum Herbaceous Alliance encompasses approximately 13.24 ha (32.7 ac) of the BSCU. This alliance is a man-made pipeline easement and is easily discernable from the surrounding vegetative communities within the BSCU. No woody vegetation occurs within this alliance; therefore, no woody vegetation data were collected. Ten 1m x 1m plots within the 250m² plots were sampled for herbaceous vegetation, equaling an area of 0.001 ha. Twenty-nine species of ground layer vegetation were recorded within these ten 1m² plots.

Alliance post-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.064, Pielou's Evenness Index (E') at 0.91, and a richness value of 29 species. Alliance pre-operational herbaceous vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 3.116, Pielou's Evenness Index (E') at 0.891, and a richness value of 33 species recorded within the plots.

The only plot within this alliance is depicted in **Photo 9, Appendix D**. Although the *Paspalum notatum* Herbaceous Alliance is man-made and disturbed on a regular basis, the ecological data are similar between pre- and post-operational assessments (**Table 23**).

Table 23. Summary and Comparison of Pre- and Post-Operational Vegetation Analyses for <i>Paspalum notatum</i> Herbaceous Alliance Big Sandy Creek Unit, Big Thicket National Preserve		
Herbaceous Vegetation ¹	Pre-Operational ³	Post-Operational
Number of Sample Plots	10	10
Area Sampled (ha)	0.001	0.001
Number of Species Recorded Within Plots (Richness)	33	29
Overall Species Evenness	0.891	0.91
Overall Species Diversity	3.116	3.064

¹ Herbaceous vegetation was sampled within ten 1 m x 1 m (1 m²) square sub-plots of the 250 m² rectangular plot.

² Pre-operational vegetation analysis data set included only data from the plots that were sampled in the post-operational analysis.

The herbaceous stratum of this alliance is dominated by sharp gayfeather (*Liatris acidota*) and bahia grass (*Paspalum notatum*). Other important species include narrow-leaf silkgrass (*Pityopsis graminifolia*), broomsedge bluestem (*Andropogon virginicus*), and healing croton (*Croton argyranthemus*). During the pre-operational vegetation analysis the dominant species were bahia grass, narrow-leaf silkgrass, *Panicum* sp., and bearded skeletongrass (*Gymnopogon ambiguus*).

DISCUSSION

In this section, the vegetation sampling results are discussed in relation to the causes of vegetative change that occurred over the past two years in the BSCU. Some impacts resulted from operations associated with the Knight Phase II 3D Seismic Survey, some have occurred naturally, and some are the result of 2004 prescribed burns. Individual plots are compared from the pre- and post-operational vegetation assessments to demonstrate the changes that occur from a variety of impacts. The extent to which exotic species have spread in the alliances and sample plots between the two years of assessment are discussed, as well. Finally, the presence of threatened and endangered species and observations of hog disturbance are reported.

Seismic Impacts

Seismic impacts are defined as damages caused by conventional surveying, drilling, and recording equipment. Conventional survey crews trimmed vegetation (less than three inches in diameter) to obtain a line-of-sight for placement of receiver stations and source points. Receiver lines ran in a north-northeast to south-southwest direction, while source racks were oriented in the west-northwest to east-southeast staggered pattern. Survey crews used chainsaws, machetes, and brush hooks to clear a path along these lines. The survey crews usually had a member placing access flagging within 100 feet of the receiver line or source rack for drills. Drill crews utilized articulating tractor-mounted drilling rigs, which were four feet wide and 12 feet in length. Each drill towed a 100-gallon water reservoir. These tractor drills maneuvered well through the forest within 100-foot approved travel corridors, generally following receiver and source lines. Each drilling crew was permitted to use chainsaws to clear minimum amounts of vegetation from the drill path while operating in the BSCU. Recording crews subjected the area to foot traffic, with a minimum of five passes along any given receiver line, as a result of lay-out, trouble-shooting, detonation of explosives, data collection, and pick-up phases of operations.

The herbaceous layer was affected the most by project-related traffic along these lines. In areas with sparse shrub and midstory layers, the seismic lines were hardly discernable, as was the case in most of the plots where seismic impacts were observed.

The ‘impact layer’ refers to shrubs and midstory trees that were less than three inches (7.62 cm) in diameter, measured at one foot above the ground surface. Apparent changes in the ‘impact layer’ were expected to be evident during field survey efforts associated with the post-project assessment, as well as in the comparison of pre- and post-assessment data and subsequent analysis of change. Seismic impacts had the potential to affect alliance diversity, evenness, and richness, as well as species frequency, density, dominance, importance, and the relative values of each within the ‘impact layer.’ Major changes were not expected in the overstory, as crews were not permitted to cut down trees any larger than three inches in diameter, with the exception of Chinese tallow and yaupon holly. There were a few instances where the crews were not aware that they were on BTNP property, had problems with their measuring devices, confused similar species, or drilling equipment became wedged, and consequently, trees larger than the stipulated limit were impacted. The majority of oversized trees cut by the surveyors measured between three to four inches in diameter, and resulted from measurement device and/or procedural flaws. Since there were more crews than environmental monitors, seismic activities on the Preserve could not be supervised at all times. Incidents of impact resulting from seismic activities outside the parameters of the permit stipulations were reported and discussed in the report *Summary of Operations Conducted On The Big Sandy Creek And Menard Creek Corridor Units of the Big Thicket National Preserve* (DESCO, July 2004).

There were a few plots observed during the post-project assessment that contained impacts from seismic activity, evidenced by tree mortality resulting from conventional survey trimming and cutting. One, in particular, was located at the intersection of a receiver line and a source rack in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance. This plot is located just above the pipeline, near the western BSCU boundary. Plot pre-operational woody vegetation analysis indices include Shannon-Weaver’s Diversity Index (H') at 1.192, Pielou’s Evenness Index (E') at 0.665, and a richness value of six (6) species. Plot post-operational woody vegetation analysis indices include Shannon-Weaver’s Diversity Index (H') at 0.421, Pielou’s Evenness Index (E') at 0.235, and a richness value of six (6) species recorded within the plot. A comparison of the pre- and post-operational data for Plot 077-080 is contained in **Table 24**.

Table 24. Impacted Plot Comparison in the Woody Strata for Plot 077-080		
	Pre-Operational Assessment Relative Importance Value (%)	Post-Operational Assessment Relative Importance Value (%)
Shrub¹		
<i>Ilex coriacea</i>	100	95.08
<i>Ilex opaca</i>	NR ⁴	4.92
Midstory²		
<i>Ilex coriacea</i>	34.04	22.26
<i>Ilex opaca</i>	32.22	43.58
<i>Nyssa sylvatica</i>	25.48	25.05
<i>Fagus grandifolia</i>	8.26	9.11
Overstory³		
<i>Pinus taeda</i>	54.52	53.93
<i>Fagus grandifolia</i>	21.51	21.89
<i>Quercus laurifolia</i>	18.55	18.72
<i>Nyssa sylvatica</i>	5.42	5.46

¹Shrub layer is woody species measured from 0.0 to 2.5 cm in a 5 m X 5 m nested subplot.

²Midstory layer is woody species measures 2.5 to 12 cm in the 10 m x 25 m (250 m²) rectangular plot.

³Overstory layer measures woody species measures > 12 cm in the 10 m x 25 m (250 m²) rectangular plot.

⁴Species was not recorded in the woody layer in either the Pre- or Post-Operational Assessment

Changes in species composition are most evident in the midstory stratum within this plot. The values shifted such that the most important species in the midstory stratum at the time of the pre-operational assessment was reduced to the third most important species documented during the post-operational assessment. Several gallberry hollies (*Ilex coriacea*) were cut along the receiver line in the northwest corner of the plot; consequently, the importance value of the species diminished. This is evident when viewing the data collected from the plot. There were 13 individual gallberry hollies, ranging in size from 2.5 to 3.5cm in diameter, recorded during the pre-operational assessment. During the post-operational assessment, only seven individuals, ranging in size from 2.5 to 4cm in diameter, were present within the plot. The numbers and sizes of the other species recorded in the plot remained constant between the two sampling events, except for American holly and blackgum, each of which gained an individual at the time of the post-operational assessment. The gain in individuals could either be attributed to tree growth or a slight change in the orientation of the plot.

As evidenced in the analysis of Plot 077-080, seismic impacts are most concentrated in the ‘impact layer’ and lead to changes in shrub and midstory species composition. Plot 077-080 sustained the most severe case of seismic impacts of all sample plots revisited during the post-operational vegetation assessment. Thirty-one (31) of the 79 plots sampled during the post-operational assessment contained visible signs of seismic activity. The majority of these sample plots showed evidence of a single receiver or source line running through, alongside, or near to the plot, as trimmed trees and branches were observed. Some plots contained scraped bark and slight track impressions, indicating that a drill had passed through the area.

In some cases, diversity, evenness, and richness were improved as a result of seismic impacts within sample plots. This could be attributable to ecological gap dynamics, where an opening in the canopy produces an increase in sunlight for the area, fluctuations in resources, and competition, leading to an increase in species diversity.

Other Impacts

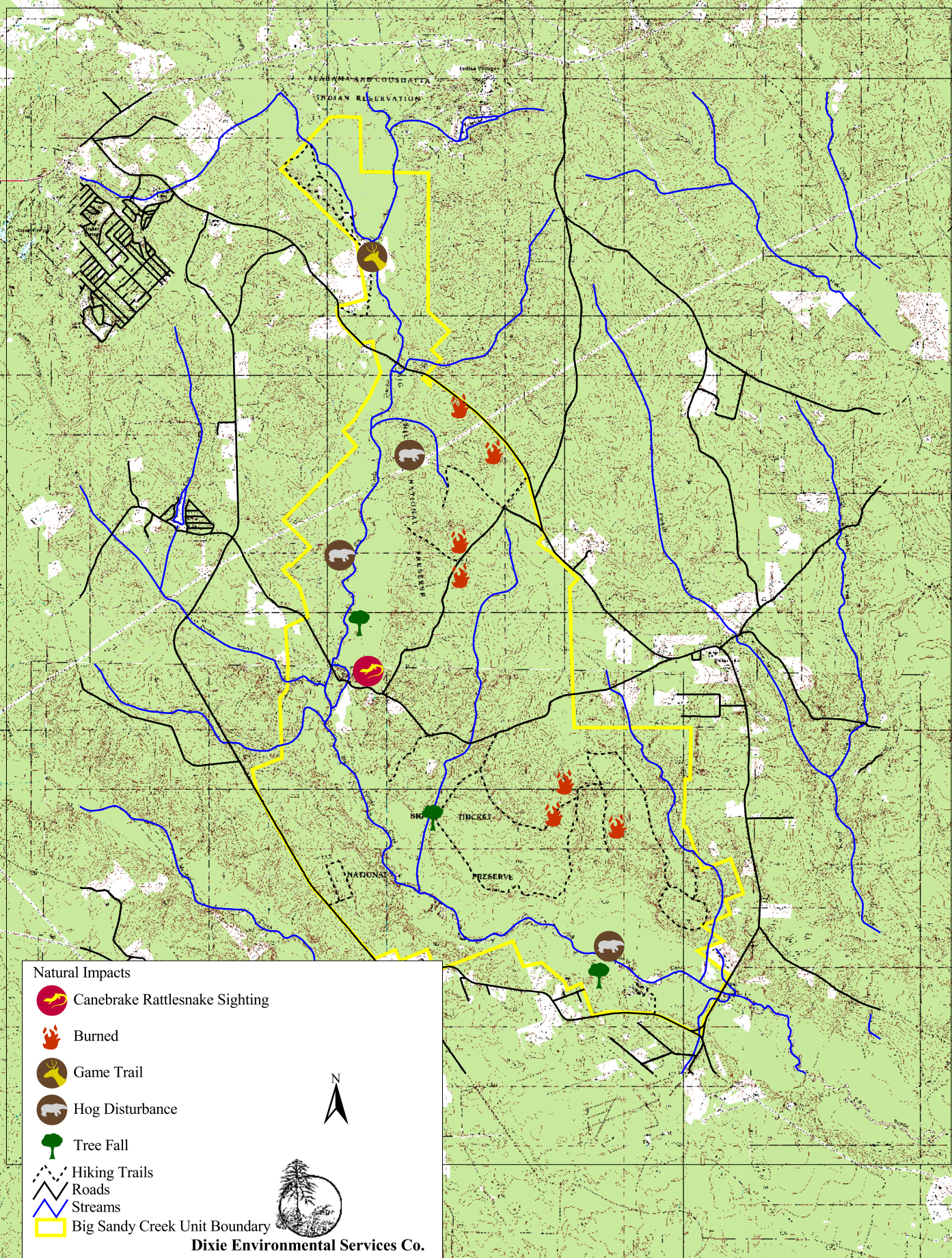
Climate, fire, wildlife, and other natural occurrences also contributed to changes in vegetative composition between the two years of assessment. These natural occurrences had the potential to affect all four vegetation layers in a variety of ways. Locations of observed natural impacts are indicated in **Figure 5**.

The herbaceous layer would vary the greatest due to fluctuations in climate, wildlife presence, prescribed burns, and other natural occurrences. Precipitation fluctuations and temperature extremes would both have affected growth in the herbaceous layer.

Wildlife

Wildlife presence in the plots, such as hog disturbance and game trails would have also impacted the herbaceous layer, in that vegetation would have been uprooted or inhibited from growth by frequent travel. Hog disturbance was observed in bottomland areas near to creeks.

Figure 5. Natural Impacts Observed During the Post-Operational Vegetation Assessment in the Big Sandy Creek Unit, BTNP



It is important to note that impacts from hog disturbance are hard to differentiate from impacts that may have resulted from drill travel in bottomland areas. Evidence of hog disturbance was noted in the field in at least five places in and adjacent to plots (**Figure 5**). Herbaceous vegetation was disturbed greatly in these plots, as well as in nearby areas. The crews encountered hogs only twice in the forest. One encounter was with a sole male, while the other involved a small drift with several litters along the Big Sandy Horse Trail. Recent disturbances could allow for an abundance of invader and/or early seral species.

Fire

At least seven plots contained observable impacts from recent fires, which would have removed the herbaceous layer at the very least. Fire provides bare ground for vegetation establishment, increases sunlight by removing smaller woody species, and returns nutrients to the soil, which usually leads to greater species diversity in early seral stages.

Similar to seismic impacts, the shrub and midstory layers would have sustained the most impact as a result of prescribed burns. As mentioned before, at least seven plots contained observable impacts from recent fires, which would have removed much of the shrub layer and some of the younger, and less fire tolerant, trees in the midstory layer.

The majority of plots affected by the 2004 prescribed burns were in the *Pinus taeda* – *Quercus* (*alba*, *falcata*, *stellata*) Forest Alliance. One plot in particular, was located within a burn compartment, and impacts resulting from fire were evident in observations of the area during the post-operational assessment, as well as in the data. The plot was found just off the northern rim of the Big Sandy Horse Trail in the BSCU. Plot pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 2.198, Pielou's Evenness Index (E') at 0.955, and a richness value of 10 species. Plot post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 1.918, Pielou's Evenness Index (E') at 0.873, and a richness value of nine (9) species recorded within the plot. A comparison of pre- and post-operational data from Plot 006-179 is contained in **Table 25**.

Table 25. Impacted Plot Comparison in the Woody Strata for Plot 006-179		
	Pre-Operational Assessment Relative Importance Value (%)	Post-Operational Assessment Relative Importance Value (%)
Shrub¹		
<i>Liquidambar styraciflua</i>	NR ⁴	50
<i>Rhamnus caroliniana</i>	NR ⁴	50
Midstory²		
<i>Cornus florida</i>	28.51	19.63
<i>Quercus marilandica</i>	17.04	NR ⁴
<i>Ilex vomitoria</i>	16.19	30.27
<i>Liquidambar styraciflua</i>	14.41	25.05
<i>Quercus falcata</i>	13.61	25.05
<i>Quercus stellata</i>	10.25	NR ⁴
Overstory³		
<i>Pinus palustris</i>	37.16	31.96
<i>Pinus echinata</i>	24.66	24.2
<i>Quercus falcata</i>	13.03	12.01
<i>Pinus taeda</i>	10.07	21.98
<i>Juniperus virginiana</i>	5.22	5.04
<i>Ilex vomitoria</i>	5.02	NR ⁴
<i>Cornus florida</i>	4.85	4.82

¹Shrub layer is woody species measured from 0.0 to 2.5 cm in a 5 m X 5 m nested subplot.

²Midstory layer is woody species measures 2.5 to 12 cm in the 10 m x 25 m (250 m²) rectangular plot.

³Overstory layer measures woody species measures > 12 cm in the 10 m x 25 m (250 m²) rectangular plot.

⁴Species was not recorded in the woody layer in either the Pre- or Post-Operational Assessment

Diversity dramatically decreased between the two years of assessment; however evenness and richness did not change as much. The overstory layer was not as affected by the burn as the midstory, in which several species changed ranking in importance values.

Tree Fall

The overstory layer within the BTNP would have been impacted some by tree fall, but would result in the least amount of overall change vegetational composition change of any layer. There were a few plots that contained observable impacts from tree fall during the post-operational

assessment. One in particular, Plot 023-025 in the *Quercus (laurifolia, phellos)* Forest Alliance, provides a good example of how the loss of a few large trees can affect the rest of the surrounding species. This plot is located along the southern border of the BSCU, just off Segno Acres road. Plot pre-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 0.625, Pielou's Evenness Index (E') at 0.285, and a richness value of nine (9) species. Plot post-operational woody vegetation analysis indices include Shannon-Weaver's Diversity Index (H') at 1.485, Pielou's Evenness Index (E') at 0.579, and a richness value of 13 species recorded within the plot. A comparison of pre- and post-operational data from Plot 023-025 is contained in **Table 26**.

Table 26. Impacted Plot Comparison in the Woody Strata for Plot 023-025		
	Pre-Operational Assessment Relative Importance Value (%)	Post-Operational Assessment Relative Importance Value (%)
Shrub¹		
<i>Ilex vomitoria</i>	94.79	59.22
<i>Hamamelis virginiana</i>	5.21	2.79
<i>Ostrya virginiana</i>	NR ⁴	15.72
<i>Callicarpa americana</i>	NR ⁴	8.36
<i>Persea palustris</i>	NR ⁴	8.36
<i>Chionanthus virginica</i>	NR ⁴	2.79
<i>Vaccinium arboretum</i>	NR ⁴	2.79
Midstory²		
<i>Ilex vomitoria</i>	43.58	25.59
<i>Ilex opaca</i>	25.96	5.4
<i>Morus rubra</i>	12.98	10.97
<i>Ostrya virginiana</i>	9.15	4.99
<i>Prunus caroliniana</i>	4.35	NR ⁴
<i>Hamamelis virginiana</i>	3.98	NR ⁴
<i>Quercus alba</i>	NR ⁴	38.39
<i>Vitis rotundifolia</i>	NR ⁴	5.4
Overstory³		
<i>Quercus laurifolia</i>	38.47	27.63
<i>Morus rubra</i>	33.32	30.65
<i>Pinus taeda</i>	19.94	29.69

Table 26. Impacted Plot Comparison in the Woody Strata for Plot 023-025		
	Pre-Operational Assessment Relative Importance Value (%)	Post-Operational Assessment Relative Importance Value (%)
<i>Ilex opaca</i>	8.27	12.03

¹Shrub layer is woody species measured from 0.0 to 2.5 cm in a 5 m X 5 m nested subplot.

²Midstory layer is woody species measures 2.5 to 12 cm in the 10 m x 25 m (250 m²) rectangular plot.

³Overstory layer measures woody species measures > 12 cm in the 10 m x 25 m (250 m²) rectangular plot.

⁴ Species was not recorded in the woody layer in either the Pre- or Post-Operational Assessment

The importance value of yaupon holly was considerably reduced within this plot between the two years of assessment; however, diversity greatly increased. Many more species were present within the shrub layer during the post-operational assessment and there was a shift in the importance value rankings of species in the midstory layer. It was documented that a large laurel oak (52 cm dbh) had fallen and taken several smaller trees, including a red mulberry (*Morus rubra*) (32 cm dbh), American hop-hornbeam (3.5 cm dbh), Carolina laurel-cherry (*Prunus caroliniana*), and several yaupon hollies, with it in the process. With an opening in the canopy that expansive, there would be more of an opportunity for individuals at the forest floor to flourish, due to the increased sunlight and resources. This is evident in the increased number of species present in the shrub layer.

Plots 006-179 and 023-025 discussed above did not contain any observable impacts from seismic activity, but did exhibit changes in vegetation composition from other causes. These individual cases indicated that fire and tree fall can both lead to just as much change in vegetation composition as seismic impacts.

Additional Factors Contributing to Change

In addition to the causes of change discussed above, changes in the woody vegetation data could also be attributable to natural tree growth, slightly askew plot measurements, misidentification of similar species (or of species in close proximity with similar bark), and increased ability to differentiate species between the two years of assessment. All of these factors could lead to inclusion of some individuals in the post-operational, but not in the pre-operational assessment, or vice versa. The size classes for shrub and midstory layers would prevent some individuals,

which were identified during the pre-operational assessment, from being included in the same layer during the post-operational assessment because of growth.

Species dominance within the majority of the alliances did not vary greatly. In some alliances, the dominant species shuffled between the pre- and post operational assessments. In one case in particular, water tupelo replaced sweetgum as the overstory dominant in the *Nyssa aquatica* – *Taxodium distichum* Semi-permanently Flooded Forest Alliance. In another case, sweetgum superceded swamp blackgum as the dominant species between the two assessments in the *Nyssa (aquatica, biflora, ogeche)* Floodplain Seasonally Flooded Forest Alliance. In these instances, it is possible that the plot corners established during the post-operational assessment were slightly askew of the original plot measurements. When setting up a plot from a single center point by measuring azimuths with a hand held compass, human error is likely to factor into the equation. One degree of error would equate to a 0.43m (1.4 ft.) shift from one end of the plot to the other end of the plot. Using a hand held compass, a 10° error is plausible. This shift could possibly result in the inclusion/exclusion of one or more trees in the plot data, effectively changing dominance within the plot.

In the other alliances where changes in the ecological parameters are slight, these minor fluctuations are perhaps the result of an increased ability to differentiate between similar species among the field crews. Sheer volume of plots within an alliance will also affect the reflected changes in diversity, evenness, and richness, as seen in the differences in change between the larger, more abundant alliances and the smaller ones.

Exotic Species

Overall, the importance value of exotic, invasive, and/or noxious species decreased between the two years of assessment. A list of species considered to be exotic, invasive, and/or noxious with the potential for occurrence in the BSCU was obtained from the National Park Service. Each species identified during the pre- and/or post-operational assessments in the BSCU is listed in **Table 27**.

Table 27. Exotic, Invasive and/or Noxious Species Found in the BTNP Big Sandy Creek Unit During Pre- and Post-Operational Vegetation Assessments	
Common	Scientific
Woody Plants	
Chinese Tallow	<i>Sapium sebiferum</i>
Chinese Privet	<i>Ligustrum sinense</i>
Japanese Climbing Fern	<i>Lygodium japonicum</i>
Japanese Honesuckle	<i>Lonicera japonica</i>
Herbaceous Plants	
Vetches	<i>Vicia spp.</i>

In addition to the species contained in **Table 27**, BTNP personnel indicated that clovers were an issue within the unit. The only clover species noted in either assessment was Carolina clover (*Trifolium carolinianum*), which is a native species. However, white or Dutch clover (*Trifolium repens*) is on the area plant list (Jones 2005) and is present in the unit.

The changes in importance of exotic, invasive, and/or noxious species between the pre- and post-operational assessment within the herbaceous (**Table 28**) and woody layers (**Table 29**) for each alliance, as well as overall for the Big Sandy Creek Unit, are shown below. Presence of the species of NPS concern is demonstrated in **Figure 6**, which indicates the relative importance value for each species, the layer in which it was found (herbaceous or woody), and the assessment in which the species was observed.

Table 28. Importance Values for Exotic, Invasive, and/or Noxious Species in the Herbaceous Stratum on the Vegetation Alliance Level		
Alliance	Pre-Operational	Post-Operational
<i>Nyssa aquatica</i> – <i>Taxodium distichum</i> Semi-permanently Flooded Forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Fraxinus pennsylvanica</i> - <i>Ulmus americana</i> - <i>Celtis (occidentalis, laevigata)</i> Temporarily Flooded Forest Alliance	<i>Vicia minutiflora</i> 1.3%	Exotic Species not recorded
<i>Quercus alba</i> -(<i>Quercus nigra</i>) Seasonally Flooded Forest Alliance	<i>Lygodium japonicum</i> 0.88%	<i>Lygodium japonicum</i> 0.65%

Table 28. Importance Values for Exotic, Invasive, and/or Noxious Species in the Herbaceous Stratum on the Vegetation Alliance Level		
<i>Quercus (laurifolia, phellos)</i> Forest Alliance	<i>Sapium sebiferum</i> 0.12% <i>Lonicera japonica</i> 0.1%	<i>Ligustrum sinense</i> 0.11%
<i>Magnolia virginiana</i> - <i>Nyssa biflora</i> - <i>(Quercus laurifolia)</i> Saturated Forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - <i>(Cliftonia monophylla)</i> Saturated Shrubland Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i> Forest Alliance	Exotic Species not recorded	<i>Sapium sebiferum</i> 0.17%
<i>Nyssa (aquatica, biflora, ogeche)</i> Floodplain Seasonally Flooded forest Alliance	Exotic Species not recorded	<i>Lonicera japonica</i> 0.52%
<i>Paspalum notatum</i> Herbaceous Alliance	Exotic Species not recorded	Exotic Species not recorded
TOTAL	<i>Lonicera japonica</i> 0.04% <i>Lygodium japonicum</i> 0.07% <i>Sapium sebiferum</i> 0.04% <i>Vicia minutiflora</i> 0.06%	<i>Ligustrum sinense</i> 0.04% <i>Lonicera japonica</i> 0.05% <i>Lygodium japonicum</i> 0.06% <i>Sapium sebiferum</i> 0.03%

Table 29. Importance Values for Exotic, Invasive, and/or Noxious Species in the Woody Strata on the Vegetation Alliance Level		
Alliance	Pre-Operational	Post-Operational
<i>Nyssa aquatica</i> – <i>Taxodium distichum</i> Semi-permanently Flooded Forest Alliance	<i>Sapium sebiferum</i> 1.59%	<i>Sapium sebiferum</i> 1.40%
<i>Fraxinus pennsylvanica</i> - <i>Ulmus americana</i> - <i>Celtis (occidentalis, laevigata)</i> Temporarily Flooded Forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Quercus alba</i> - <i>(Quercus nigra)</i> Seasonally Flooded Forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Quercus (laurifolia, phellos)</i> Forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Magnolia virginiana</i> - <i>Nyssa biflora</i> - <i>(Quercus laurifolia)</i> Saturated Forest Alliance	<i>Sapium sebiferum</i> 0.69%	<i>Sapium sebiferum</i> 1.43%
<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - <i>(Cliftonia monophylla)</i> Saturated Shrubland Alliance	Exotic Species not recorded	Exotic Species not recorded

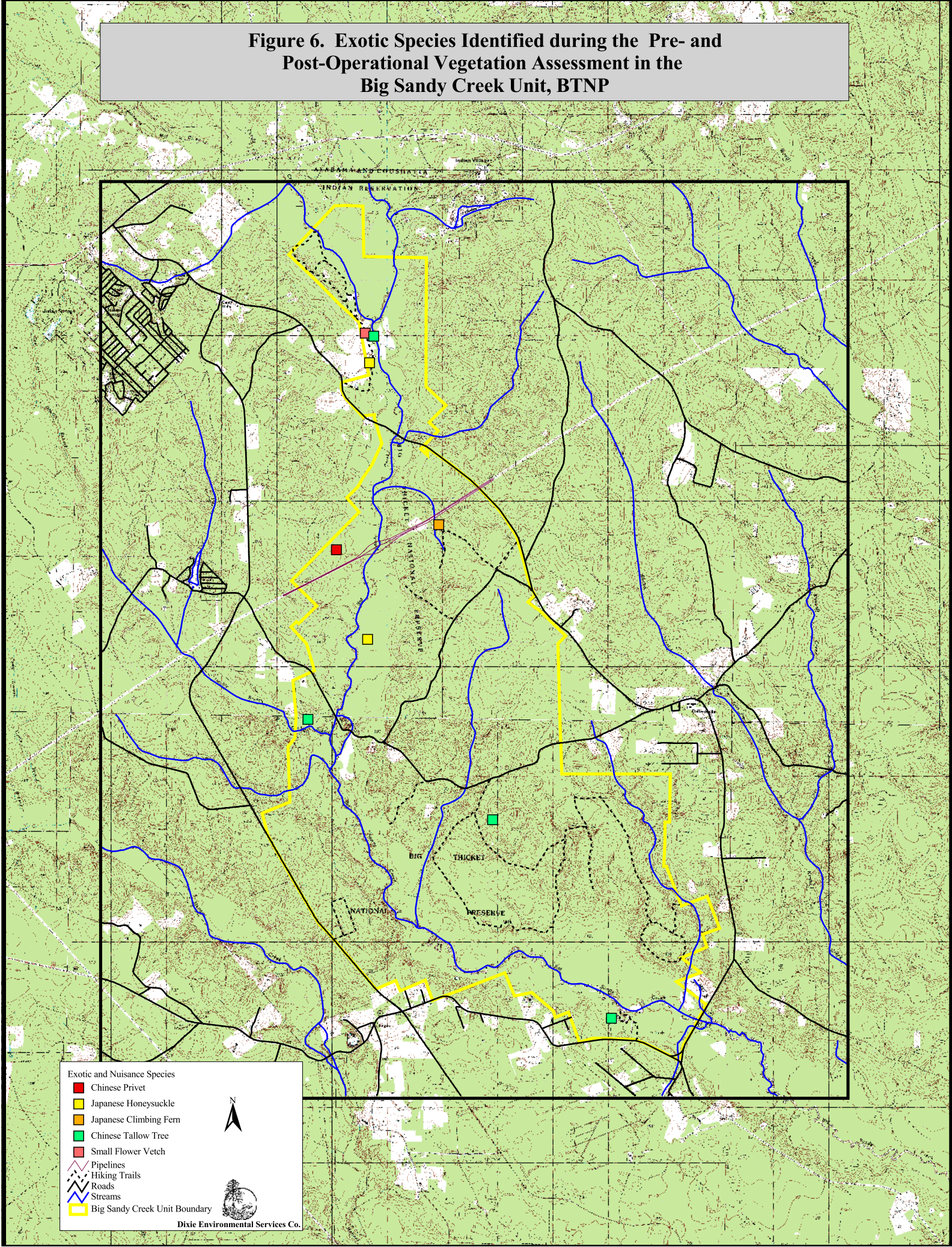
Table 29. Importance Values for Exotic, Invasive, and/or Noxious Species in the Woody Strata on the Vegetation Alliance Level		
<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>) Forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Nyssa</i> (<i>aquatica</i> , <i>biflora</i> , <i>ogeche</i>) Floodplain Seasonally Flooded forest Alliance	Exotic Species not recorded	Exotic Species not recorded
<i>Paspalum notatum</i> Herbaceous Alliance	Exotic Species not recorded	Exotic Species not recorded
TOTAL	<i>Sapium sebiferum</i> 0.14%	<i>Sapium sebiferum</i> 0.08%

There were a few plots in which an exotic species was documented during the post-operational assessment that had not been documented in the pre-operational assessment. There were also a few plots that no longer contained exotic species during the post-operational assessment. Plot specific locations and importance values of exotic, invasive, or noxious species identified during the pre- and post-operational assessments are contained in **Table 30**. Most of these occurrences were in the larger alliances where species diversity would be expected to vary due to larger geographic expanses.

Table 30. Plot Specific Locations and Importance Values of Exotic Species in the Big Sandy Creek Unit, Big Thicket National Preserve							
Scientific Name	Plot Number	Location		Pre-Operational RIV %		Post-Operational RIV %	
		Latitude °N	Longitude °W	Herb	Woody	Herb	Woody
Woody Plants and Vines							
<i>Sapium sebiferum</i>	098-096	30.6245	94.7054		0.75		0.76
	079-087B	30.576	94.6472		15.73		2.52
	091-131	30.6873	94.6941	0.39			
	074-077	30.6086	94.6702			0.26	
<i>Ligustrum sinense</i>	076-078	30.6925	94.6988			0.37	
<i>Lygodium japonicum</i>	111-134	30.6566	94.6813	3.65		2.01	
<i>Lonicera japonica</i>	091-132	30.683	94.6948	0.18			
	097-094	30.6378	94.6944			0.74	
Herbaceous Plants							
<i>Vicia spp.</i>	010-160	30.6878	94.6957	0.76			

As evident in the above tables, species of concern did not cover a significant portion of any vegetation layer in the alliances or in individual plots.

Figure 6. Exotic Species Identified during the Pre- and Post-Operational Vegetation Assessment in the Big Sandy Creek Unit, BTNP



Exotic and Nuisance Species

- Chinese Privet
- Japanese Honeysuckle
- Japanese Climbing Fern
- Chinese Tallow Tree
- Small Flower Vetch

- Pipelines
- Hiking Trails
- Roads
- Streams
- Big Sandy Creek Unit Boundary



Dixie Environmental Services Co.

Seismic crews were allowed to cut down any size of Chinese tallow. There was also an exotics team working during the seismic survey to eradicate the presence of Chinese tallow. These two factors heavily contributed to the marked decrease in Relative Importance Values of the species between the two years of assessment.

Threatened and Endangered Species

A canebrake rattlesnake (*Crotalus horridus*) was observed about 40 meters south-southwest of Plot 053-150, which is located to the southwest of the intersection of Sunflower and Monroe-Lilley roads and east of Big Sandy Creek (**Appendix D, Photo 15**).

The known scarlet catchfly (*Silene subciliata*) site along the Big Sandy Horse Trail was located during the survey. The plants were not in bloom at the time of the assessment, as the flowering season starts in July and lasts until August.



CONCLUSION

In cooperation with the BTNP, a post-operational vegetation assessment of the Big Sandy Creek Unit was completed in April and May, 2005. Data were collected from 79 woody and 480 herbaceous sample plots as a result of the survey and was compared to pre-operational vegetation assessment data for the same sample plots in order to analyze change in vegetative composition within the BSCU.

The net vegetative change within the BSCU and the individual alliances is relatively small between the pre-and post-operational assessments. This small change is comparative in nature to normal and other anthropogenic disturbances occurring within the BSCU, on a plot by plot basis. As compared to the natural disturbances within the BSCU, seismic activities were much more wide-spread and covered a greater area. Conversely, it is hard to compare disturbance from seismic activities, which are linear impacts with disturbance from prescribed burning, which occurs in patch mosaics. The data also illustrate that the impacts sustained from seismic activities were not intense enough to change the natural character of the BSCU as a whole, or the individual alliances.

It is DESCO's opinion that changes in vegetation composition between the Pre-and Post-Operational Assessment are minimal and are as much a function of the Knight Phase II 3D Seismic survey as the natural shifts in the forest. **Appendix C** provides tables that summarize each alliance by layer and then by species frequency, density, dominance, and importance, with the relative values of each included for both the pre- and post-operational assessment.

The net vegetative change within the BSCU and the individual alliances is relatively small, considering the sample size and acreage involved with the unit. These minor changes reflect the low intensity level of impacts on the herbaceous, shrub, midstory, and overstory vegetation layers from the Knight Phase II 3D Seismic Survey. DESCO believes that impacts were minimal as a result of SAL's cooperation with the National Park Service and environmental monitors, and

the crews' compliance with permit stipulations and restrictions designed to minimize impacts to the environment.

Exotic species did not spread significantly within the individual plots or alliances between the two years of assessment, and their presence was actually reduced in some cases.



PERSONS/AGENCIES CONSULTED

Dixie Environmental Services Co. prepared this report. **Table 31** summarizes the individuals that contributed to the post-operational vegetation assessment and report. On several occasions, the field crew was observed by a variety of BTNP personnel, including Lisa Jamison, BTNP Biologist; Marcus Obregon, BTNP-EPMT Crew Leader; Paula Carrington, BTNP Resource Education Specialist; Alley Freer, BTNP Volunteer; Pat Steffan, BTNP Volunteer; and Janice Hudson, BTNP Visitor Youth Assistant.

Table 31. Individuals Involved in the Preparation of this Report	
Name	Title
Tanya Matherne	DESCO, President, Project Principal/Report Editor
Dusty Pate	BTNP Oil and Gas Program Manager
Deanna Fusco	BTNP Lead Fire Effects Monitor
Arthur Perkins	DESCO, Senior Ecologist, Primary Report Author
Stanley Jones	Expert Plant Taxonomist, Report Editor
Larry Brown	Expert Plant Taxonomist
Jacqueline Smith	DESCO, GIS Manager, Ecologist, Primary Report Author
Justin Rowland	DESCO, Field Crew Ecologist
Christy White	Field Crew Ecologist
Jay Mann	Field Crew Ecologist
Gary Kowalski	DESCO, Operations Manager

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Appendix A

Plot Summary for Post-Operational Survey

Appendix A: Plot Summary from the 2005 Post-Operational Survey								
Plot Number	UTM Easting	UTM Northing	Degree Decimal Latitude	Degree Decimal Longitude	Alliance	Herb Plot	Date Sampled	Impacts/Observations
002-003	342548.7	3387960.22	30.6139	-94.6426	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	N	5/21/2005	Source Rack and Drill Access
003-005	341931.3	3385102.09	30.588	-94.6486	<i>Magnolia virginiana</i> - <i>Nyssa biflora</i> - (<i>Quercus laurifolia</i>)	Y	5/16/2005	None
004-006	342315.6	3384592.63	30.5835	-94.6445	<i>Nyssa aquatica</i> - <i>Taxodium distichum</i>	Y	5/13/2005	None
004-007	340295.7	3385298.3	30.5896	-94.6657	<i>Nyssa aquatica</i> - <i>Taxodium distichum</i>	Y	5/16/2005	None
006-009	340813.1	3386790.2	30.6031	-94.6605	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	N	5/18/2005	Burned and Receiver Line
006-178	340775.9	3387012.32	30.6051	-94.6609	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	N	5/18/2005	Source Rack and Drill Access
006-179	341004.5	3387323.47	30.6079	-94.6586	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	Y	5/9/2005	Burned
010-160	337583.9	3396230.86	30.6878	-94.6957	<i>Fraxinus pennsylvanica</i> - <i>Ulmus americana</i> - <i>Celtis (occidentalis, leavigata)</i>	Y	4/25/2005	Receiver Line
013-013	337298.8	3392623.03	30.6552	-94.6981	<i>Quercus (laurifolia, phellos)</i>	Y	5/2/2005	Source Rack
017-016	341033.3	3390680.19	30.6382	-94.6588	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	N	5/18/2005	None
023-025	341564.4	3384057.28	30.5785	-94.6523	<i>Quercus (laurifolia, phellos)</i>	N	5/23/2005	Treefall
029-029	337518.9	3390002.36	30.6316	-94.6954	<i>Quercus alba</i> - (<i>Quercus nigra</i>)	Y	5/12/2005	Drill Access and Treefall
030-030	337799.6	3390455.69	30.6358	-94.6925	<i>Quercus (laurifolia, phellos)</i>	Y	5/11/2005	None
034-033	337212.4	3391530.72	30.6454	-94.6988	<i>Quercus (laurifolia, phellos)</i>	Y	5/6/2005	Source Rack and Drill Access
038-157	336683.8	3391240.28	30.6427	-94.7043	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	Y	4/29/2005	Receiver Line
041-035	337238.3	3390507.49	30.6361	-94.6984	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	Y	5/10/2005	Source Rack near
050-139	341737.1	3384553.78	30.583	-94.6505	<i>Quercus (laurifolia, phellos)</i>	Y	5/16/2005	Receiver Line
053-150	337675.1	3389189.36	30.6243	-94.6936	<i>Quercus (laurifolia, phellos)</i>	Y	5/10/2005	Receiver Line and Canebrake Rattlesnake nearby
056-043	338451.5	3387826.38	30.6121	-94.6853	<i>Quercus alba</i> - (<i>Quercus nigra</i>)	N	5/7/2005	None
060-049	338740.8	3395109.86	30.6778	-94.6834	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	N	4/27/2005	None
061-151	338244.8	3390454.1	30.6358	-94.6879	<i>Pinus taeda</i> - <i>Quercus (alba, falcata, stellata)</i>	N	5/11/2005	None
063-167	337788.2	3384650.11	30.5834	-94.6917	<i>Quercus alba</i> - (<i>Quercus nigra</i>)	N	5/19/2005	None
064-058	339427.2	3387208.99	30.6067	-94.675	<i>Quercus alba</i> - (<i>Quercus nigra</i>)	N	5/5/2005	Source Rack
067-141	341287	3384893.82	30.5861	-94.6553	<i>Nyssa aquatica</i> - <i>Taxodium distichum</i>	Y	5/16/2005	Receiver Line

Appendix A: Plot Summary from the 2005 Post-Operational Survey								
Plot Number	UTM Easting	UTM Northing	Degree Decimal Latitude	Degree Decimal Longitude	Alliance	Herb Plot	Date Sampled	Impacts/Observations
068-065	341883.9	3386578.65	30.6013	-94.6493	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	Y	5/17/2005	Burned
070-069	339021.4	3393028.87	30.6591	-94.6802	<i>Paspalum notatum</i>	Y	5/3/2005	None
071-070	338373.8	3392838.9	30.6573	-94.6869	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	5/4/2005	Hog Disturbance
072-071	338568.1	3393391.53	30.6623	-94.685	<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>)	N	5/4/2005	Receiver Line
072-072	338658.7	3393011.6	30.6589	-94.684	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	5/4/2005	Source Rack
074-077	339889.2	3387411.91	30.6086	-94.6702	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	Y	5/9/2005	None
076-078	337290.1	3396759.11	30.6925	-94.6988	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	4/26/2005	Hog Disturbance
077-080	337061.3	3392303.54	30.6523	-94.7005	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	5/2/2005	Source Rack and Receiver Line Junction
079-087B	342047.5	3383814.97	30.576416	-94.647194	<i>Nyssa aquatica</i> - <i>Taxodium distichum</i>	N	5/19/2005	None
080-103	339233	3393672.16	30.665	-94.6781	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	4/27/2005	Burned and Source Rack
081-123	338080.2	3389946.23	30.6312	-94.6895	<i>Cyrilla racemiflora</i> - <i>Ilex coriacea</i> - (<i>Cliftonia monophylla</i>)	N	5/12/2005	None
081-124	338399.7	3389648.33	30.6286	-94.6861	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	5/12/2005	None
084-182	339804.4	3392892.43	30.658	-94.672	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	Y	5/3/2005	Burned
084-183	339664.7	3393260.73	30.6613	-94.6735	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	5/2/2005	Receiver Line
088-090	337406.7	3393365.62	30.6619	-94.6971	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	4/28/2005	Receiver Line
089-047	338576.7	3395593.41	30.6822	-94.6852	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	4/27/2005	None
091-001	338166.6	3395498.43	30.6813	-94.6895	<i>Quercus alba</i> - (<i>Quercus nigra</i>)	N	4/26/2005	None
091-131	337739.1	3396176.26	30.6873	-94.6941	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	4/25/2005	None
091-132	337661.4	3395692.71	30.683	-94.6948	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	4/25/2005	None
091-133	338088.8	3395243.7	30.679	-94.6903	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	4/26/2005	Game Trail on Receiver Line
092-079	338693.3	3393745.56	30.6655	-94.6837	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	4/28/2005	Source Rack and Drill Access
092-159	338529.6	3393262.72	30.6612	-94.6853	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	N	5/4/2005	yes-r line
093-079	336949	3391625.71	30.6462	-94.7016	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	Y	5/6/2005	None
094-097b	337196.6	3391145.74	30.641888	-94.698916	<i>Nyssa aquatica</i> - <i>Taxodium distichum</i>	Y	4/29/2005	Hog Disturbance
094-098	336521.6	3390783.81	30.6385	-94.7059	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	Y	4/29/2005	Receiver Line and Drill Access

Appendix A: Plot Summary from the 2005 Post-Operational Survey								
Plot Number	UTM Easting	UTM Northing	Degree Decimal Latitude	Degree Decimal Longitude	Alliance	Herb Plot	Date Sampled	Impacts/Observations
094-099	336720.2	3390563.62	30.6366	-94.7038	<i>Quercus (laurifolia, phellos)</i>	Y	5/10/2005	Source Rack and Drill Access
095-164	338188.3	3392295.53	30.6524	-94.6887	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	Y	5/3/2005	None
097-092	337760.7	3393611.72	30.6642	-94.6934	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	Y	4/28/2005	Drill Access
097-094	337626.9	3390680.19	30.6378	-94.6944	<i>Nyssa (aquatica, biflora, ogeche)</i>	Y	5/11/2005	None
098-096	336543.2	3389229.54	30.6245	-94.7054	<i>Magnolia virginiana - Nyssa biflora - (Quercus laurifolia)</i>	Y	5/20/2005	None
101-125	337264.2	3388379.01	30.6169	-94.6978	<i>Quercus (laurifolia, phellos)</i>	N	5/20/2005	None
102-057	337264.2	3385827.42	30.5939	-94.6974	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	N	5/23/2005	None
103-051	337307.4	3386500.93	30.6	-94.697	<i>Quercus alba - (Quercus nigra)</i>	Y	5/23/2005	Receiver Line
104-061	338611.3	3386971.53	30.6044	-94.6835	<i>Quercus (laurifolia, phellos)</i>	N	5/5/2005	None
104-186	338756.6	3386720.21	30.6022	-94.682	<i>Quercus alba - (Quercus nigra)</i>	N	5/5/2005	None
105-036	341171.5	3386444.81	30.6	-94.6567	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	Y	5/18/2005	Source Rack and Drill Access
106-021	342039.3	3385395.67	30.5907	-94.6475	<i>Cyrilla racemiflora - Ilex coriacea - (Cliftonia monophylla)</i>	Y	5/16/2005	None
106-032	341516.9	3385555.42	30.5921	-94.653	<i>Quercus (laurifolia, phellos)</i>	Y	5/9/2005	None
106-106	343192	3384748.06	30.585	-94.6354	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	Y	5/17/2005	None
106-110	342907.1	3387398.96	30.6089	-94.6388	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	N	5/21/2005	Source Rack and Drill Access
106-111	341106.7	3385991.48	30.5959	-94.6573	<i>Quercus (laurifolia, phellos)</i>	Y	5/9/2005	Receiver Line
107-115	339574	3384877.58	30.5857	-94.6731	<i>Nyssa (aquatica, biflora, ogeche)</i>	Y	5/17/2005	None
107-119	343200.7	3385490.66	30.5917	-94.6354	<i>Nyssa (aquatica, biflora, ogeche)</i>	Y	5/17/2005	None
107-120	340687.9	3384821.46	30.5853	-94.6615	<i>Nyssa aquatica - Taxodium distichum</i>	Y	5/19/2005	None
107-121	343032.3	3383383.76	30.5727	-94.6369	<i>Nyssa (aquatica, biflora, ogeche)</i>	Y	5/17/2005	Hog Disturbance
108-170	342455.5	3384294.51	30.5808	-94.643	<i>Quercus (laurifolia, phellos)</i>	Y	5/13/2005	Drill Access
109-019	342989.1	3385244.56	30.5894	-94.6376	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	Y	5/14/2005	None
109-020	342678.3	3385620.18	30.5928	-94.6409	<i>Quercus (laurifolia, phellos)</i>	Y	5/14/2005	None
109-041	342449.4	3384972.57	30.5869	-94.6432	<i>Quercus (laurifolia, phellos)</i>	Y	5/13/2005	None
109-114	342678.3	3384782.6	30.5852	-94.6408	<i>Quercus alba - (Quercus nigra)</i>	Y	5/13/2005	Drill Access
111-134	338913.5	3392756.87	30.6566	-94.6813	<i>Quercus alba - (Quercus nigra)</i>	Y	5/3/2005	None
112-156	339230.4	3391388.41	30.6443	-94.6777	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	N	5/24/2005	Burned
113-095	339245.9	3390809.71	30.6391	-94.6775	<i>Pinus taeda - Quercus (alba, falcata, stellata)</i>	N	5/24/2005	Burned

Appendix A: Plot Summary from the 2005 Post-Operational Survey								
Plot Number	UTM Easting	UTM Northing	Degree Decimal Latitude	Degree Decimal Longitude	Alliance	Herb Plot	Date Sampled	Impacts/Observations
114-154	339127.8	3390106.58	30.6328	-94.6786	<i>Pinus taeda</i> - <i>Quercus</i> (<i>alba</i> , <i>falcata</i> , <i>stellata</i>)	N	5/24/2005	None
114-193	339029.7	3388180.72	30.6154	-94.6793	<i>Quercus</i> (<i>laurifolia</i> , <i>phellos</i>)	N	5/20/2005	None

Appendix B

Plant Species List for the Big Sandy Creek Unit, Big Thicket National Preserve

Appendix B: Plant Species List for the Big Sandy Creek Unit, Big Thicket National Preserve		
Genus	Species	Common Name
<i>Acer</i>	<i>barbatum</i>	Southern Sugar Maple
<i>Acer</i>	<i>negundo</i>	Box Elder
<i>Acer</i>	<i>rubrum</i>	Red Maple
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	Drummond Red Maple
<i>Acer</i>	<i>rubrum</i> var. <i>trilobum</i>	Trilobed Red Maple
<i>Aira</i>	<i>caryophyllea</i>	Annual Hair-Grass
<i>Allium</i>	<i>canadense</i>	Canada Garlic
<i>Allium</i>	<i>canadense</i> var. <i>mobile</i>	Onion
<i>Allium</i>	<i>drummondii</i>	Drummond Onion
<i>Allium</i>	<i>species</i>	Onion
<i>Alnus</i>	<i>serrulata</i>	Hazel Alder
<i>Ambrosia</i>	<i>artemisiifolia</i>	Common Ragweed
<i>Ampelopsis</i>	<i>arborea</i>	Peppervine
<i>Andropodon</i>	<i>glomeratus</i>	Bushy Bluestem
<i>Andropogon</i>	<i>virginicus</i>	Broomsedge Bluestem
<i>Aralia</i>	<i>spinosa</i>	Angelicatree
<i>Arenaria</i>	<i>drummondii</i>	Sandwort
<i>Arenaria</i>	<i>serpyllifolia</i>	Thymeleaf Sandwort
<i>Arisaema</i>	<i>dracontium</i>	Jack-In-The-Pulpit
<i>Arisaema</i>	<i>triphyllum</i>	Indian Jack-In-The-Pulpit
<i>Aristolochia</i>	<i>serpentaria</i>	Virginia Dutchman's Pipe
<i>Arnoglossum</i>	<i>ovatum</i>	Lanceleaf Indian Plantain
<i>Arundinaria</i>	<i>gigantea</i>	Giant Cane
<i>Asclepias</i>	<i>perennis</i>	Shore Milkweed
<i>Ascyrum</i>	<i>hypercoides</i>	St. Andrew's Cross
<i>Asimina</i>	<i>parviflora</i>	Pawpaw
<i>Aster</i>	<i>lateriflorus</i>	California Aster
<i>Aster</i>	<i>species</i>	Aster
<i>Aster</i>	<i>subulatus</i>	Hierba del Marrano
<i>Athyrium</i>	<i>filix-femina</i>	Southern Ladyfern
<i>Baccharis</i>	<i>halimifolia</i>	Eastern Baccharis
<i>Bacopa</i>	<i>caroliniana</i>	Carolina Water Hyssop
<i>Bacopa</i>	<i>species</i>	Water Hyssop
<i>Berchemia</i>	<i>scandens</i>	Alabama Supplejack
<i>Berlandiera</i>	<i>betonicifolia</i>	Texas Greeneyes
<i>Betula</i>	<i>nigra</i>	River Birch
<i>Bidens</i>	<i>mitis</i>	Soft Beggar Ticks
<i>Bidens</i>	<i>species</i>	Beggar's Ticks
<i>Bignonia</i>	<i>capreolata</i>	Crossvine
<i>Boehmeria</i>	<i>cylindrica</i>	Falsenettle
<i>Botrychium</i>	<i>bitermum</i>	Sparselobe Grapefern
<i>Botrychium</i>	<i>dissectum</i>	Cutleaf Grapefern
<i>Brunnichia</i>	<i>ovata</i>	American Buckwheat Vine
<i>Callicarpa</i>	<i>americana</i>	American Beautyberry
<i>Callirhoe</i>	<i>involucrata</i>	Low Poppymallow
<i>Callitriche</i>	<i>heterophylla</i>	Water Chickweed
<i>Calopogon</i>	<i>barbatus</i>	Bearded Grasspink
<i>Campsis</i>	<i>radicans</i>	Common Trumpet creeper
<i>Capsicum</i>	<i>annuum</i>	Chilipiquin

Appendix B: Plant Species List for the Big Sandy Creek Unit, Big Thicket National Preserve		
Genus	Species	Common Name
<i>Carex</i>	<i>abscondia</i>	Thicket Sedge
<i>Carex</i>	<i>albolutescens</i>	Greenish-White Sedge
<i>Carex</i>	<i>atlantica</i>	Prickly Bog Sedge
<i>Carex</i>	<i>blanda</i>	Woodland sedge
<i>Carex</i>	<i>caroliniana</i>	Carolina Sedge
<i>Carex</i>	<i>cherokeensis</i>	Cherokee Sedge
<i>Carex</i>	<i>complanata</i>	Sedge
<i>Carex</i>	<i>corrugata</i>	Wringle-fruit Caric-sedge
<i>Carex</i>	<i>crebriflora</i>	Sedge
<i>Carex</i>	<i>debilis</i>	Spindlefruit Sedge
<i>Carex</i>	<i>digitalis</i>	Wood sedge
<i>Carex</i>	<i>flaccosperma</i>	Thin-Fruit Sedge
<i>Carex</i>	<i>frankii</i>	Franks Sedge
<i>Carex</i>	<i>glaucescens</i>	Southern Sedge
<i>Carex</i>	<i>intumescens</i>	Bladder Sedge
<i>Carex</i>	<i>joorii</i>	Hummock Sedge
<i>Carex</i>	<i>kraliana</i>	Kral's Caric Sedge
<i>Carex</i>	<i>lativena</i>	Broad-veined Caric Sedge
<i>Carex</i>	<i>leavenworthii</i>	Leavenworth's sedge
<i>Carex</i>	<i>leptalea</i>	Bristlystalked Sedge
<i>Carex</i>	<i>longii</i>	Longs Sedge
<i>Carex</i>	<i>louisianica</i>	Louisiana Sedge
<i>Carex</i>	<i>lupulina</i>	Hop Sedge
<i>Carex</i>	<i>lurida</i>	Sallow Sedge
<i>Carex</i>	<i>nigromarginata</i>	Black-Margined Florida Caric Sedge
<i>Carex</i>	<i>oxylepis</i>	Sharp-scale sedge
<i>Carex</i>	<i>species</i>	Sedge
<i>Carex</i>	<i>striatula</i>	Lined Sedge
<i>Carex</i>	<i>triangularis</i>	Eastern Fox Sedge
<i>Carex</i>	<i>tribuloides</i>	Bristle-bract sedge
<i>Carpinus</i>	<i>caroliniana</i>	American Hornbeam
<i>Carya</i>	<i>aquatica</i>	Water Hickory
<i>Carya</i>	<i>cordiformis</i>	Bitternut Hickory
<i>Carya</i>	<i>glabra</i>	Pignut Hickory
<i>Carya</i>	<i>species</i>	Hickory
<i>Carya</i>	<i>texana</i>	Black Hickory
<i>Carya</i>	<i>tomentosa</i>	Mockernut Hickory
<i>Celtis</i>	<i>laevigata</i>	Sugar Hackberry
<i>Celtis</i>	<i>occidentalis</i>	Hackberry
<i>Centella</i>	<i>erecta</i>	Spadeleaf
<i>Cercidium</i>	<i>texanum</i>	Texas Paloverde
<i>Chaerophyllum</i>	<i>tainturieri</i>	Chervil
<i>Chasmanthium</i>	<i>latifolium</i>	Inland Sea Oats
<i>Chasmanthium</i>	<i>laxum</i> var. <i>laxum</i>	Narrowleaf woodoats
<i>Chasmanthium</i>	<i>laxum</i> var. <i>sessiliflorum</i>	Narrowleaf Woodoats
<i>Chenopodium</i>	<i>chenopodioides</i>	Low Goosefoot
<i>Chionanthus</i>	<i>virginica</i>	Fringe Tree
<i>Ciclosperma</i>	<i>leptophyllum</i>	Marsh Parsley
<i>Claytonia</i>	<i>virginica</i>	Springbeauty

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Genus	Species	Common Name
<i>Clitoria</i>	<i>mariana</i>	Atlantic Pigeonwings
<i>Cocculus</i>	<i>carolinus</i>	Carolina Snailseed
<i>Coelorachis</i>	<i>cylindrica</i>	Cylinder Jointtail Grass
<i>Commelina</i>	<i>virginica</i>	Day-Flower
<i>Commelina</i>	<i>virginica</i>	Virginia dayflower
<i>Cornus</i>	<i>florida</i>	Flowering Dogwood
<i>Crataegus</i>	<i>marshallii</i>	Parsley Hawthorne
<i>Crataegus</i>	<i>spatulata</i>	Littlehip Hawthorne
<i>Crataegus</i>	<i>species</i>	Hawthorne
<i>Croton</i>	<i>argyranthemus</i>	Healing Croton
<i>Croton</i>	<i>willdenowii</i>	Willdenow's Croton
<i>Cyperus</i>	<i>virens</i>	Green Flatsedge
<i>Cyrilla</i>	<i>racemiflora</i>	Titi
<i>Diodia</i>	<i>teres</i>	Rough Buttonweed
<i>Dioscorea</i>	<i>villosa</i>	Atlantic Yam
<i>Dysodiopsis</i>	<i>species</i>	Dog-fennel
<i>Echinochloa</i>	<i>walteri</i>	Walter's Cock's Spur
<i>Eleocharis</i>	<i>species</i>	Spikesedge
<i>Eleocharis</i>	<i>tuberculosa</i>	Conecupsedge
<i>Elephantopus</i>	<i>carolinianus</i>	Leafy Elephantfoot
<i>Elephantopus</i>	<i>species</i>	Elephantfoot
<i>Elephantopus</i>	<i>tomentosus</i>	Hairy Elephantfoot
<i>Elymus</i>	<i>virginicus</i>	Intermediate Wheatgrass
<i>Eragrostis</i>	<i>elliotti</i>	Elliott's Love Grass
<i>Eragrostis</i>	<i>hirsuta</i>	Bigtop Lovegrass
<i>Erianthus</i>	<i>giganeus</i>	Sugarcane Plumegrass
<i>Erigeron</i>	<i>philadelphicus</i>	Philadelphia Fleabane
<i>Eriogonum</i>	<i>alatum</i>	Winged Buckwheat
<i>Eriogonum</i>	<i>annuum</i>	Annual Buckwheat
<i>Eupatorium</i>	<i>capillifolium</i>	Dog-fennel
<i>Eupatorium</i>	<i>compositifolium</i>	Yankeeweed
<i>Eupatorium</i>	<i>seritonum</i>	Late Eupatorium
<i>Euphorbia</i>	<i>corollata</i>	Flowering spurge
<i>Fagus</i>	<i>grandifolia</i>	American Beech
<i>Festuca</i>	<i>paradoxa</i>	Clustered Fescue
<i>Fraxinus</i>	<i>americana</i>	White Ash
<i>Fraxinus</i>	<i>caroliniana</i>	Carolina Ash
<i>Fraxinus</i>	<i>pensylvanica</i>	Green Ash
<i>Fraxinus</i>	<i>species</i>	Ash
<i>Galium</i>	<i>aparine</i>	Catchweed Bedstraw
<i>Galium</i>	<i>species</i>	Bedstraw
<i>Galium</i>	<i>tinctorium</i>	Dye Bedstraw
<i>Galium</i>	<i>trifidum</i>	Threepetal Bedstraw
<i>Galium</i>	<i>uniflorum</i>	Smooth Bedstraw
<i>Gamochaeta</i>	<i>pensylvanica</i>	Pennsylvania Everlasting
<i>Gelsemium</i>	<i>sempervirens</i>	Carolina Jessamine
<i>Geranium</i>	<i>carolinianum</i>	Carolina Geranium
<i>Gleditsia</i>	<i>triacanthos</i>	Common Honeylocust
<i>Gratiola</i>	<i>neglecta</i>	Yellowseed hedge hyssop

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Genus	Species	Common Name
<i>Gratiola</i>	<i>species</i>	Hedge Hyssop
<i>Gratiola</i>	<i>virginiana</i>	Virginia Hedge Hyssop
<i>Gymnopogon</i>	<i>ambiguus</i>	Bearded Skeletongrass
<i>Hamamelis</i>	<i>virginiana</i>	Common witchhazel
<i>Helianthemum</i>	<i>georgianum</i>	Georgia Sunrose
<i>Heterotheca</i>	<i>canescens</i>	Gray Golden Aster
<i>Heterotheca</i>	<i>latifolia</i>	Goldaster
<i>Heterotheca</i>	<i>pilosa</i>	Soft Goldaster
<i>Hydrocotyl</i>	<i>umbellata</i>	Umbrella Water-Pennywort
<i>Hydrocotyl</i>	<i>verticillata</i>	Whorled Pennywort
<i>Hygrophila</i>	<i>lacustris</i>	Gulf Swampweed
<i>Hypericum</i>	<i>crus-andreae</i>	St. Peter's Wort
<i>Hypericum</i>	<i>hypericoides</i>	St. Andrew's Cross
<i>Hypericum</i>	<i>species</i>	St. John's Wort
<i>Hypoxis</i>	<i>curtisii</i>	Common Stargrass
<i>Hypoxis</i>	<i>hirsuta</i>	Common goldstar
<i>Hyptis</i>	<i>alata</i>	Cluster bushmint
<i>Ilex</i>	<i>coriacea</i>	Baygall Holly
<i>Ilex</i>	<i>decidua</i>	Possumhaw
<i>Ilex</i>	<i>longipes</i>	Georgia Holly
<i>Ilex</i>	<i>opaca</i>	American Holly
<i>Ilex</i>	<i>species</i>	Holly
<i>Ilex</i>	<i>vomitaria</i>	Yaupon Holly
<i>Iris</i>	<i>virginica</i>	Virginia Iris
<i>Itea</i>	<i>virginica</i>	Virginia Sweetspire
<i>Juncus</i>	<i>acuminatis</i>	Knotleaf Rush
<i>Juncus</i>	<i>bufonius</i>	Toad Rush
<i>Juncus</i>	<i>capitatus</i>	Capped Rush
<i>Juncus</i>	<i>coriaceus</i>	Leathery Rush
<i>Juncus</i>	<i>dichotomus</i>	Forked Rush
<i>Juncus</i>	<i>diffusissimus</i>	Slimpod Rush
<i>Juncus</i>	<i>effusus</i>	Common Rush
<i>Juncus</i>	<i>species</i>	Rush
<i>Juncus</i>	<i>tenuis</i>	Slender Rush
<i>Juniperus</i>	<i>virginiana</i>	Eastern Redcedar
<i>Justicia</i>	<i>ovata</i> var. <i>lanceolata</i>	Lance-leaved Water-willow
<i>Justicia</i>	<i>species</i>	Water-willow
<i>Krigia</i>	<i>cespitosa</i>	Common Dwarf Dandelion
<i>Lechea</i>	<i>species</i>	Pin Weed
<i>Leersia</i>	<i>lenticularis</i>	Catchflygrass
<i>Leersia</i>	<i>virginica</i>	Whitegrass
<i>Lespedeza</i>	<i>stuevei</i>	Stueve Lespedeza
<i>Liatris</i>	<i>acidota</i>	Sharp Gayfeather
<i>Ligustrum</i>	<i>sinense</i>	Chinese Privet
<i>Lindernia</i>	<i>dubia</i>	Yellowseed false pimpernel
<i>Linum</i>	<i>species</i>	Flax
<i>Linum</i>	<i>striatum</i>	Rigid Flax
<i>Liquidamber</i>	<i>styraciflua</i>	Sweetgum
<i>Lobelia</i>	<i>appendiculata</i>	Earflower Lobelia

Appendix B: Plant Species List for the Big Sandy Creek Unit, Big Thicket National Preserve		
Genus	Species	Common Name
<i>Lonicera</i>	<i>japonica</i>	Japanese Honeysuckle
<i>Ludwigia</i>	<i>decurrens</i>	Wing-leaf Primrose-willow
<i>Ludwigia</i>	<i>glandulosa</i>	Torrey Seedbox
<i>Ludwigia</i>	<i>peplodes</i>	Smooth floating Primrose-willow
<i>Ludwigia</i>	<i>pilsoa</i>	Hairy Seedbox
<i>Ludwigia</i>	<i>repens</i>	Creeping Seedbox
<i>Ludwigia</i>	<i>species</i>	Seedbox
<i>Lycopus</i>	<i>americanus</i>	American Bugle Weed
<i>Lycopus</i>	<i>species</i>	Bugleweed
<i>Lycopus</i>	<i>virginicus</i>	Virginia Bugleweed
<i>Lygodium</i>	<i>japonicum</i>	Japanese Climbing Fern
<i>Magnolia</i>	<i>grandifolia</i>	Southern Magnolia
<i>Magnolia</i>	<i>virginiana</i>	Sweetbay
<i>Matelea</i>	<i>decipiens</i>	Climbing Milkvine
<i>Matelea</i>	<i>gonocarpa</i>	Angle Pod Milkvine
<i>Matelea</i>	<i>species</i>	Milkvine
<i>Melica</i>	<i>mutica</i>	Twoflower Melic
<i>Mikania</i>	<i>scandens</i>	Climbing Hempweed
<i>Mitchella</i>	<i>repens</i>	Partridge-berry
<i>Morus</i>	<i>rubra</i>	Red Mulberry
<i>Myosotis</i>	<i>macrocarpa</i>	Spring Forget-Me-Not
<i>Myosotis</i>	<i>species</i>	Forget-Me-Not
<i>Myrica</i>	<i>cerifera</i>	Southern Wax Myrtle
<i>Myrica</i>	<i>heterophylla</i>	Wax Myrtle
<i>Nyssa</i>	<i>aquatica</i>	Water Tupelo
<i>Nyssa</i>	<i>biflora</i>	Swamp Black-Gum
<i>Nyssa</i>	<i>species</i>	Black Gum
<i>Nyssa</i>	<i>sylvatica</i>	Black Gum
<i>Onoclea</i>	<i>sensibilis</i>	Sensitivefern
<i>Oplismenus</i>	<i>hirtellus</i>	Basketgrass
<i>Ostrya</i>	<i>virginiana</i>	Eastern Hophornbean
<i>Oxalis</i>	<i>corniculata</i>	Creeping Lady's Sorrel
<i>Oxalis</i>	<i>debilis</i> var. <i>corymbosa</i>	Corymbose Pink Woodsorrel
<i>Oxalis</i>	<i>dillenii</i>	Yellow Woodsorrel
<i>Oxalis</i>	<i>stricta</i>	Yellow Woodsorrel
<i>Panicum</i>	<i>aciculare</i>	Panic Grass
<i>Panicum</i>	<i>anceps</i>	Beaked Panicum
<i>Panicum</i>	<i>boscii</i>	Panic Grass
<i>Panicum</i>	<i>clandestinum</i>	Deertongue
<i>Panicum</i>	<i>commutatum</i>	Rosettegrass
<i>Panicum</i>	<i>dichotomiflorum</i>	Fall Panicum
<i>Panicum</i>	<i>dichotomum</i>	Parted panicum
<i>Panicum</i>	<i>gymnocarpum</i>	Panic Grass
<i>Panicum</i>	<i>lanuginosum</i>	Wooly Rosettegrass
<i>Panicum</i>	<i>laxiflorum</i>	Openflower Panicum
<i>Panicum</i>	<i>scoparium</i>	Panic Grass
<i>Panicum</i>	<i>species</i>	Panic Grass
<i>Parietaria</i>	<i>species</i>	Pellitory
<i>Parthenocissus</i>	<i>quinquefolia</i>	Virginia Creeper

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Genus	Species	Common Name
<i>Paspalum</i>	<i>notatum</i>	Bahia Grass
<i>Paspalum</i>	<i>species</i>	Paspalum
<i>Persea</i>	<i>borbonia</i>	Redbay
<i>Persea</i>	<i>palustris</i>	Swamp Redbay
<i>Phalaris</i>	<i>species</i>	Canarygrass
<i>Pinus</i>	<i>echinata</i>	Shortleaf Pine
<i>Pinus</i>	<i>palustris</i>	Long-Leaf Pine
<i>Pinus</i>	<i>taeda</i>	Loblolly Pine
<i>Pityopsis</i>	<i>graminifolia</i>	Silkgrass
<i>Planera</i>	<i>aquatica</i>	Water Elm
<i>Plantago</i>	<i>aristata</i>	Bottlebrush Plantain
<i>Plantago</i>	<i>species</i>	Plantain
<i>Platanus</i>	<i>occidentalis</i>	American Sycamore
<i>Poa</i>	<i>annua</i>	Annual Bluegrass
<i>Poa</i>	<i>autumnalis</i>	Autumn Bluegrass
<i>Polygonum</i>	<i>hydropiperoides</i>	Smartweed
<i>Polygonum</i>	<i>lapathifolium</i>	Curly-top Smartweed
<i>Polygonum</i>	<i>punctatum</i>	Water Smartweed
<i>Polygonum</i>	<i>virginianum</i>	Jump Seed
<i>Polypremum</i>	<i>procumbens</i>	Juniperleaf
<i>Poncirus</i>	<i>trifoliata</i>	Trifoliate Orange
<i>Prunus</i>	<i>caroliniana</i>	Laurel Cherry
<i>Prunus</i>	<i>serotina</i>	Black cherry
<i>Prunus</i>	<i>species</i>	Prunus Seedling
<i>Prunus</i>	<i>virginiana</i>	Western Choke Cherry
<i>Pteridium</i>	<i>aquilinum</i> var. <i>pseudocaudatum</i>	Bracken Fern
<i>Ptilimnium</i>	<i>capillaceum</i>	Threadleaf Mockbush
<i>Ptilimnium</i>	<i>species</i>	Mock Bishop's Weed
<i>Quercus</i>	<i>alba</i>	White Oak
<i>Quercus</i>	<i>falcata</i>	Southern Red Oak
<i>Quercus</i>	<i>falcata</i> var. <i>pogodaefolia</i>	Cherrybark Oak
<i>Quercus</i>	<i>hemispherica</i>	Durant's Oak
<i>Quercus</i>	<i>incana</i>	Bluejack Oak
<i>Quercus</i>	<i>laurifolia</i>	Laurel Oak
<i>Quercus</i>	<i>lyrata</i>	Overcup Oak
<i>Quercus</i>	<i>marilandica</i>	Blackjack Oak
<i>Quercus</i>	<i>michauxii</i>	Basket Oak
<i>Quercus</i>	<i>nigra</i>	Water Oak
<i>Quercus</i>	<i>phellos</i>	Willow Oak
<i>Quercus</i>	<i>species</i>	Oak
<i>Quercus</i>	<i>stellata</i>	Post Oak
<i>Quercus</i>	<i>velutina</i>	Black Oak
<i>Ranunculus</i>	<i>carolinianus</i>	Carolina Buttercup
<i>Ranunculus</i>	<i>hispidus</i>	Marsh Buttercup
<i>Ranunculus</i>	<i>pusillus</i>	Weak Buttercup
<i>Ranunculus</i>	<i>species</i>	Buttercup
<i>Rhamnus</i>	<i>caroliniana</i>	Carolina Buckthorn
<i>Rhododendron</i>	<i>canescens</i>	Piedmont Azalea
<i>Rhododendron</i>	<i>oblongifolium</i>	Texas Azalea

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Genus	Species	Common Name
<i>Rhododendron</i>	species	Wild Azalea
<i>Rhododendron</i>	<i>viscosum</i>	Swamp Azalea
<i>Rhus</i>	<i>copallina</i>	Flameleaf Sumac
<i>Rhus</i>	<i>microphylla</i>	Littleleaf Sumac
<i>Rhus</i>	species	Sumac
<i>Rhynchosia</i>	<i>senna</i> var. <i>texana</i>	Texas Snoutbean
<i>Rhynchosia</i>	species	Snoutbean
<i>Rhynchospora</i>	<i>divergens</i>	Spreading Beakrush
<i>Rhynchospora</i>	<i>inexpansa</i>	Nodding beakrush
<i>Rhynchospora</i>	<i>latifolia</i>	Broadleaf Snoutbean
<i>Rhynchospora</i>	<i>mixta</i>	Mingled Beakrush
<i>Rhynchospora</i>	species	Beakrush
<i>Rubus</i>	<i>argutus</i>	Highbush Blackberry
<i>Rubus</i>	species	Blackberry
<i>Rubus</i>	<i>trivialis</i>	Southern Dewberry
<i>Ruellia</i>	species	Ruellia
<i>Sabatia</i>	<i>angularis</i>	Squarestem Rosegentian
<i>Sabatia</i>	<i>campestris</i>	Prairie Rosegentian
<i>Sabatia</i>	<i>gentianoides</i>	Pinewoods Rosegentian
<i>Sabatia</i>	species	Rose-Gentian
<i>Saccharum</i>	<i>baldwinii</i>	Baldwin's Plume Grass
<i>Sagittaria</i>	<i>graminea</i>	Grassy Arrowhead
<i>Sagittaria</i>	<i>latifolia</i>	Common Arrowhead
<i>Sagittaria</i>	<i>papillosa</i>	Nipplebract Arrowhead
<i>Salvia</i>	<i>lyrata</i>	Lyreleaf Sage
<i>Sambucus</i>	<i>canadensis</i>	American Elderberry
<i>Sanicula</i>	<i>canadensis</i>	Canada Sanicle
<i>Sapium</i>	<i>sebiferum</i>	Chinese Tallow Tree
<i>Sarracenia</i>	<i>alata</i>	Pitcher Plant
<i>Sassaras</i>	<i>albidum</i>	Common Sassafras
<i>Saururus</i>	<i>cernuus</i>	Common Lizardtail
<i>Schizachyrium</i>	<i>scoparium</i>	Little Bluestem
<i>Scleria</i>	<i>oligantha</i>	Littlehead Nutrush
<i>Scleria</i>	<i>reticularis</i>	Hairy Reticulated Nutrush
<i>Scleria</i>	species	Nutrush
<i>Scleria</i>	<i>triglomerata</i>	Whip nutrush
<i>Scutellaria</i>	<i>integrefolia</i>	Hyssop Skullcap
<i>Sebastiana</i>	<i>fruticosa</i>	Sebastian Bush
<i>Selaginella</i>	species	Selaginella
<i>Senecio</i>	<i>ampullaceus</i>	Texas Groundsel
<i>Senecio</i>	<i>glabellus</i>	Butterweed
<i>Sideroxylon</i>	<i>lanuginosa</i>	Coma
<i>Smilax</i>	<i>bona-nox</i>	Saw Greenbrier
<i>Smilax</i>	<i>glauca</i>	Cat Greenbrier
<i>Smilax</i>	<i>laurifolia</i>	Laurel Greenbrier
<i>Smilax</i>	<i>pumila</i>	Sarsaparilla Greenbrier
<i>Smilax</i>	<i>rotundifolia</i>	Common Greenbrier
<i>Smilax</i>	<i>smallii</i>	Small's Greenbrier
<i>Smilax</i>	species	Common Greenbrier

Appendix B: Plant Species List for the Big Sandy Creek Unit, Big Thicket National Preserve		
Genus	Species	Common Name
<i>Smilax</i>	<i>tamnoides</i>	Bristly Greenbrier
<i>Smilax</i>	<i>walteri</i>	Redbead Greenbrier
<i>Solanum</i>	<i>carolinense</i>	Carolina Horsenettle
<i>Solanum</i>	<i>species</i>	Nightshade
<i>Solidago</i>	<i>species</i>	Goldenrod
<i>Sparganium</i>	<i>americanum</i>	American Burreed
<i>Sphagnum</i>	<i>species</i>	Sphagnum Moss
<i>Sphenopholis</i>	<i>obtusata</i>	Prairie Wedgescale
<i>Spilanthus</i>	<i>americana</i>	Creeping Spotflower
<i>Spiranthes</i>	<i>praecox</i>	Leaved ladies' tresses
<i>Stachys</i>	<i>tenuifolia</i>	Slender-leaf Betony
<i>Stylosanthes</i>	<i>biflora</i>	Pencilflower
<i>Styrax</i>	<i>americana</i>	American Snowbell
<i>Styrax</i>	<i>grandifolia</i>	Bigleaf Snowbell
<i>Symplocos</i>	<i>tinctoria</i>	Common Sweetleaf
<i>Taxodium</i>	<i>distichum</i>	Baldcypress
<i>Thelypteris</i>	<i>kunthii</i>	Southern Shield Fern
<i>Tilia</i>	<i>americana</i>	American Basswood
<i>Tovara</i>	<i>virginiana</i>	Virginia Jumpseed
<i>Toxicodendron</i>	<i>radicans</i>	Poison Ivy
<i>Trachelosperum</i>	<i>difforme</i>	American Star Jasmine
<i>Trepocarpus</i>	<i>aethusae</i>	White Nymph
<i>Triadenum</i>	<i>walteri</i>	Walter's St. John's Wort
<i>Trifolium</i>	<i>caroliniana</i>	Carolina Clover
<i>Triodanis</i>	<i>perfolia</i>	Clasping Venus looking-glass
<i>Ulmus</i>	<i>alata</i>	Winged Elm
<i>Ulmus</i>	<i>americana</i>	American Elm
<i>Ulmus</i>	<i>crassifolia</i>	Cedar Elm
<i>Ulmus</i>	<i>rubra</i>	Slippery Elm
<i>Ulmus</i>	<i>species</i>	Elm Seedling
<i>Vaccinium</i>	<i>arboreum</i>	Farkleberry
<i>Vaccinium</i>	<i>corymbosum</i>	Highbush Blueberry
<i>Vaccinium</i>	<i>fuscatum</i>	Thick-leaf Blueberry
<i>Vaccinium</i>	<i>species</i>	Blueberry Seedling
<i>Vaccinium</i>	<i>stamineum</i>	Common Deerberry
<i>Valerianella</i>	<i>species</i>	Cornsalad
<i>Valerianella</i>	<i>texana</i>	Texas Cornsalad
<i>Viburnum</i>	<i>acerifolium</i>	Arrowwood
<i>Viburnum</i>	<i>dentatum</i>	Arrowwood
<i>Viburnum</i>	<i>nudum</i>	Possumhaw Viburnum
<i>Viburnum</i>	<i>prunifolium</i>	Black-Haw
<i>Viburnum</i>	<i>rafinesquianum</i>	Rafinesque Viburnum
<i>Viburnum</i>	<i>rufidulum</i>	Downy Viburnum
<i>Vicia</i>	<i>minutiflora</i>	Smallflower Vetch
<i>Viola</i>	<i>lanceolata s. vittata</i>	Lanceleaf violet
<i>Viola</i>	<i>missouriensis</i>	Missouri Violet
<i>Viola</i>	<i>palmata</i>	Early Blue Grape
<i>Viola</i>	<i>primulifolia</i>	Primrose-leaf Violet
<i>Viola</i>	<i>sororia</i>	Sisterly Violet

Appendix B: Plant Species List for the Big Sandy Creek Unit, Big Thicket National Preserve		
Genus	Species	Common Name
<i>Viola</i>	<i>species</i>	Violet
<i>Viola</i>	<i>triloba</i>	Trilobe violet
<i>Vitis</i>	<i>cinerea</i>	Sweet grape
<i>Vitis</i>	<i>riparia</i>	Riverbank Grape
<i>Vitis</i>	<i>rotundifolia</i>	Muscadine Grape
<i>Vitis</i>	<i>aestivalis</i>	Summer Grape
<i>Woodwardia</i>	<i>areolata</i>	Netted Chainfern
<i>Woodwardia</i>	<i>species</i>	Chainfern
<i>Zizia</i>	<i>aurea</i>	Golden Alexanders

Appendix C

Pre- and Post-Operational Assessment Vegetation Summaries for the Woody and Herbaceous Strata

**Table 10B. Summary of the Herbaceous Stratum in the *Paspalum notatum* Herbaceous Alliance in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Liatris</i>	<i>acidota</i>	1	3.45	22	27.24	30.69	10.23
<i>Paspalum</i>	<i>notatum</i>	1	3.45	21.5	26.63	30.07	10.02
<i>Pityopsis</i>	<i>gramifolia</i>	1	3.45	7	8.67	12.12	4.04
<i>Andropogon</i>	<i>virginicus</i>	1	3.45	6	7.43	10.88	3.63
<i>Croton</i>	<i>argenteus</i>	1	3.45	4.25	5.26	8.71	2.9
<i>Gymnopogon</i>	<i>ambiguus</i>	1	3.45	3	3.72	7.16	2.39
<i>Pinus</i>	<i>taeda</i>	1	3.45	2.25	2.79	6.23	2.08
<i>Erigeron</i>	<i>philadelphicus</i>	1	3.45	1.75	2.17	5.62	1.87
<i>Stylosanthes</i>	<i>biflora</i>	1	3.45	1.75	2.17	5.62	1.87
<i>Heterotheca</i>	<i>latifolia</i>	1	3.45	1.5	1.86	5.31	1.77
<i>Gamochaeta</i>	<i>pennsylvanica</i>	1	3.45	1	1.24	4.69	1.56
<i>Panicum</i>	<i>species</i>	1	3.45	1	1.24	4.69	1.56
<i>Quercus</i>	<i>falcata</i> var. <i>pogodaefolia</i>	1	3.45	1	1.24	4.69	1.56
<i>Lechea</i>	<i>species</i>	1	3.45	0.75	0.93	4.38	1.46
<i>Rhyncosia</i>	<i>senna</i> var. <i>texana</i>	1	3.45	0.75	0.93	4.38	1.46
<i>Elephantopus</i>	<i>tomentosus</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Euphorbia</i>	<i>corollata</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Heterotheca</i>	<i>pilosa</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Persea</i>	<i>palustris</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Rhus</i>	<i>copallina</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Rhynchospora</i>	<i>latifolia</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Smilax</i>	<i>smallii</i>	1	3.45	0.5	0.62	4.07	1.36
<i>Aira</i>	<i>caryophyllea</i>	1	3.45	0.25	0.31	3.76	1.25
<i>Berlaniera</i>	<i>betonicifolia</i>	1	3.45	0.25	0.31	3.76	1.25
<i>Hedera</i>	<i>helix</i>	1	3.45	0.25	0.31	3.76	1.25
<i>Helianthus</i>	<i>georgianum</i>	1	3.45	0.25	0.31	3.76	1.25
<i>Panicum</i>	<i>scoparium</i>	1	3.45	0.25	0.31	3.76	1.25
<i>Plantago</i>	<i>aristata</i>	1	3.45	0.25	0.31	3.76	1.25
<i>Rhyncosia</i>	<i>senna</i> var. <i>texana</i>	1	3.45	0.25	0.31	3.76	1.25
Totals			100	80.75	100	200	66.67

**Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Ilex</i>	<i>vomitorea</i>	0.71	3.12	2.12	7.66	10.77	3.59
<i>Persia</i>	<i>palustris</i>	0.46	2.02	1.3177	4.76	6.78	2.26
<i>Mitchella</i>	<i>repens</i>	0.58	2.57	0.8125	2.93	5.5	1.83
<i>Chasmanthium</i>	<i>laxum</i>	0.31	1.37	1.1302	4.08	5.46	1.82
<i>Quercus</i>	<i>laurifolia</i>	0.38	1.65	1.0156	3.67	5.32	1.77
<i>Chasmanthium</i>	<i>latifolia</i>	0.19	0.82	1.0838	3.91	4.74	1.58
<i>Smilax</i>	<i>glauca</i>	0.67	2.93	0.3802	1.37	4.31	1.44
<i>Callicarpa</i>	<i>americanum</i>	0.5	2.2	0.4948	1.79	3.99	1.33
<i>Smilax</i>	<i>smallii</i>	0.58	2.57	0.3125	1.13	3.7	1.23
<i>Vitis</i>	<i>rotundifolia</i>	0.5	2.2	0.401	1.45	3.65	1.22
<i>Parthenocissus</i>	<i>quinquefolia</i>	0.42	1.83	0.4479	1.62	3.45	1.15
<i>Sebastiania</i>	<i>fruticosa</i>	0.25	1.1	0.625	2.26	3.36	1.12
<i>Smilax</i>	<i>pumila</i>	0.33	1.47	0.5104	1.84	3.31	1.1
<i>Toxicodendron</i>	<i>radicans</i>	0.4	1.74	0.4323	1.56	3.3	1.1
<i>Arundinaria</i>	<i>gigantea</i>	0.15	0.64	0.625	2.26	2.9	0.97
<i>Ilex</i>	<i>opaca</i>	0.38	1.65	0.2969	1.07	2.72	0.91
<i>Ilex</i>	<i>coriacea</i>	0.1	0.46	0.6146	2.22	2.68	0.89
<i>Sphagnum</i>	<i>species</i>	0.08	0.37	0.6198	2.24	2.61	0.87
<i>Acer</i>	<i>rubrum</i>	0.42	1.83	0.1667	0.6	2.44	0.81
<i>Berchemia</i>	<i>scandens</i>	0.4	1.74	0.1719	0.62	2.36	0.79
<i>Myrica</i>	<i>heterophylla</i>	0.1	0.46	0.5312	1.92	2.38	0.79
<i>Polygonum</i>	<i>punctatum</i>	0.04	0.18	0.526	1.9	2.08	0.69
<i>Bignonia</i>	<i>capreolata</i>	0.27	1.19	0.2292	0.83	2.02	0.67
<i>Vaccinium</i>	<i>arboreum</i>	0.15	0.64	0.3698	1.34	1.98	0.66
<i>Quercus</i>	<i>nigra</i>	0.25	1.1	0.2188	0.79	1.89	0.63
<i>Carex</i>	<i>abscondia</i>	0.21	0.92	0.2604	0.94	1.86	0.62
<i>Panicum</i>	<i>commutatum</i>	0.25	1.1	0.2135	0.77	1.87	0.62
<i>Juncus</i>	<i>effusus</i>	0.04	0.18	0.4531	1.64	1.82	0.61
<i>Quercus</i>	<i>hemispherica</i>	0.1	0.46	0.3802	1.37	1.83	0.61
<i>Ranunculus</i>	<i>species</i>	0.04	0.18	0.4271	1.54	1.73	0.58
<i>Rhododendron</i>	<i>oblongifolium</i>	0.06	0.27	0.375	1.35	1.63	0.54
<i>Scleria</i>	<i>oligantheses</i>	0.21	0.92	0.1719	0.62	1.54	0.51
<i>Smilax</i>	<i>hispida</i>	0.25	1.1	0.099	0.36	1.46	0.49
<i>Poa</i>	<i>autumnalis</i>	0.06	0.27	0.3125	1.13	1.4	0.47
<i>Gelsemium</i>	<i>sempervirens</i>	0.23	1.01	0.1042	0.38	1.38	0.46

Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Saururus</i>	<i>cernuus</i>	0.08	0.37	0.276	1	1.36	0.45
<i>Sassafras</i>	<i>albidum</i>	0.23	1.01	0.0885	0.32	1.33	0.44
<i>Ostrya</i>	<i>virginiana</i>	0.17	0.73	0.1458	0.53	1.26	0.42
<i>Vaccinium</i>	<i>species</i>	0.17	0.73	0.1354	0.49	1.22	0.41
<i>Carex</i>	<i>debilis</i>	0.12	0.55	0.1771	0.64	1.19	0.4
<i>Quercus</i>	<i>albus</i>	0.19	0.82	0.1042	0.38	1.2	0.4
<i>Carpinus</i>	<i>caroliniana</i>	0.19	0.82	0.0938	0.34	1.16	0.39
<i>Paspalum</i>	<i>notatum</i>	0.02	0.09	0.2969	1.07	1.16	0.39
<i>Asimina</i>	<i>parviflora</i>	0.17	0.73	0.1094	0.4	1.13	0.38
<i>Carex</i>	<i>species</i>	0.12	0.55	0.151	0.55	1.1	0.37
<i>Vaccinium</i>	<i>corymbosum</i>	0.1	0.46	0.1771	0.64	1.1	0.37
<i>Boehmeria</i>	<i>cylindrica</i>	0.15	0.64	0.1198	0.43	1.07	0.36
<i>Carex</i>	<i>corrugata</i>	0.12	0.55	0.1354	0.49	1.04	0.35
<i>Panicum</i>	<i>species</i>	0.12	0.55	0.1302	0.47	1.02	0.34
<i>Carex</i>	<i>leptalea</i>	0.08	0.37	0.1615	0.58	0.95	0.32
<i>Nyssa</i>	<i>sylvatica</i>	0.15	0.64	0.0885	0.32	0.96	0.32
<i>Smilax</i>	<i>rotundifolia</i>	0.15	0.64	0.0885	0.32	0.96	0.32
<i>Galium</i>	<i>trifidum</i>	0.15	0.64	0.0833	0.3	0.94	0.31
<i>Chasmanthium</i>	<i>sessileflorum</i>	0.15	0.64	0.0729	0.26	0.9	0.3
<i>Liquidambar</i>	<i>styraciflua</i>	0.15	0.64	0.0677	0.24	0.89	0.3
<i>Saccharum</i>	<i>baldwinii</i>	0.12	0.55	0.0938	0.34	0.89	0.3
<i>Carex</i>	<i>atlantica</i>	0.06	0.27	0.1562	0.56	0.84	0.28
<i>Justicia</i>	<i>ovata</i> var. <i>lanceolata</i>	0.08	0.37	0.1302	0.47	0.84	0.28
<i>Woodwardia</i>	<i>areolata</i>	0.08	0.37	0.1198	0.43	0.8	0.27
<i>Cornus</i>	<i>florida</i>	0.08	0.37	0.1042	0.38	0.74	0.25
<i>Quercus</i>	<i>falcata</i>	0.12	0.55	0.0521	0.19	0.74	0.25
<i>Rubus</i>	<i>argudus</i>	0.06	0.27	0.1354	0.49	0.76	0.25
<i>Polygonum</i>	<i>virginianum</i>	0.02	0.09	0.1719	0.62	0.71	0.24
<i>Rubus</i>	<i>trivialis</i>	0.08	0.37	0.099	0.36	0.72	0.24
<i>Fraxinus</i>	<i>pennsylvania</i>	0.08	0.37	0.0885	0.32	0.69	0.23
<i>Pinus</i>	<i>taeda</i>	0.12	0.55	0.0417	0.15	0.7	0.23
<i>Quercus</i>	<i>species</i>	0.1	0.46	0.0677	0.24	0.7	0.23
<i>Scleria</i>	<i>species</i>	0.1	0.46	0.0677	0.24	0.7	0.23
<i>Carex</i>	<i>longii</i>	0.08	0.37	0.0781	0.28	0.65	0.22
<i>Carex</i>	<i>nigromarginata</i>	0.1	0.46	0.0573	0.21	0.67	0.22

Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey

Big Sandy Creek Unit, Big Thicket National Preserve

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Prunus</i>	<i>serotina</i>	0.1	0.46	0.0573	0.21	0.67	0.22
<i>Viburnum</i>	<i>nudum</i>	0.04	0.18	0.1302	0.47	0.65	0.22
<i>Acer</i>	<i>barbatum</i>	0.08	0.37	0.0729	0.26	0.63	0.21
<i>Leersia</i>	<i>lenticulris</i>	0.08	0.37	0.0729	0.26	0.63	0.21
<i>Carex</i>	<i>flaccosperma</i>	0.1	0.46	0.0365	0.13	0.59	0.2
<i>Carex</i>	<i>leavenworthii</i>	0.08	0.37	0.0677	0.24	0.61	0.2
<i>Oxalis</i>	<i>stricta</i>	0.1	0.46	0.0365	0.13	0.59	0.2
<i>Allium</i>	<i>canadense</i>	0.06	0.27	0.0781	0.28	0.56	0.19
<i>Hamamelis</i>	<i>virginiana</i>	0.08	0.37	0.0573	0.21	0.57	0.19
<i>Itea</i>	<i>virginica</i>	0.06	0.27	0.0781	0.28	0.56	0.19
<i>Carex</i>	<i>caroliniana</i>	0.08	0.37	0.0521	0.19	0.55	0.18
<i>Carex</i>	<i>cherokeensis</i>	0.02	0.09	0.125	0.45	0.54	0.18
<i>Carex</i>	<i>digitalis</i>	0.08	0.37	0.0521	0.19	0.55	0.18
<i>Nyssa</i>	<i>biflora</i>	0.08	0.37	0.0469	0.17	0.54	0.18
<i>Opilsmenus</i>	<i>hirtellus</i>	0.08	0.37	0.0469	0.17	0.54	0.18
<i>Triadenum</i>	<i>walteri</i>	0.06	0.27	0.0729	0.26	0.54	0.18
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	0.06	0.27	0.0677	0.24	0.52	0.17
<i>Linum</i>	<i>striatum</i>	0.08	0.37	0.0417	0.15	0.52	0.17
<i>Rhamnus</i>	<i>caroliniana</i>	0.08	0.37	0.0417	0.15	0.52	0.17
<i>Viola</i>	<i>sorrensus</i>	0.06	0.27	0.0677	0.24	0.52	0.17
<i>Brunnichia</i>	<i>ovata</i>	0.08	0.37	0.0312	0.11	0.48	0.16
<i>Carex</i>	<i>nigromarginata</i>	0.08	0.37	0.0312	0.11	0.48	0.16
<i>Oxalis</i>	<i>dillenii</i>	0.06	0.27	0.0573	0.21	0.48	0.16
<i>Viola</i>	<i>lanceolata</i> s. <i>vittata</i>	0.04	0.18	0.0781	0.28	0.47	0.16
<i>Elephantopus</i>	<i>carolinianus</i>	0.06	0.27	0.0521	0.19	0.46	0.15
<i>Myrica</i>	<i>cerifera</i>	0.08	0.37	0.026	0.09	0.46	0.15
<i>Panicum</i>	<i>gymnocarpum</i>	0.06	0.27	0.0469	0.17	0.44	0.15
<i>Pityopsis</i>	<i>graminifolia</i>	0.02	0.09	0.099	0.36	0.45	0.15
<i>Vaccinium</i>	<i>stamineum</i>	0.04	0.18	0.0729	0.26	0.45	0.15
<i>Viola</i>	<i>pruniflorum</i>	0.04	0.18	0.0729	0.26	0.45	0.15
<i>Arisaema</i>	<i>dracontium</i>	0.06	0.27	0.0365	0.13	0.41	0.14
<i>Carex</i>	<i>tribuloides</i>	0.06	0.27	0.0417	0.15	0.43	0.14
<i>Elephantopus</i>	<i>species</i>	0.06	0.27	0.0365	0.13	0.41	0.14
<i>Carex</i>	<i>basiantha</i>	0.04	0.18	0.0573	0.21	0.39	0.13
<i>Carya</i>	<i>texensis</i>	0.06	0.27	0.0312	0.11	0.39	0.13

Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Myosotis</i>	<i>macrocarpa</i>	0.06	0.27	0.0312	0.11	0.39	0.13
<i>Quercus</i>	<i>phellos</i>	0.06	0.27	0.0312	0.11	0.39	0.13
<i>Smilax</i>	<i>walteri</i>	0.06	0.27	0.0312	0.11	0.39	0.13
<i>Ascyrum</i>	<i>hyperoides</i>	0.06	0.27	0.026	0.09	0.37	0.12
<i>Carex</i>	<i>blanda</i>	0.06	0.27	0.0208	0.08	0.35	0.12
<i>Carex</i>	<i>intumescens</i>	0.02	0.09	0.0729	0.26	0.36	0.12
<i>Elephantopus</i>	<i>tomentosa</i>	0.06	0.27	0.0208	0.08	0.35	0.12
<i>Onoclea</i>	<i>sensibilis</i>	0.06	0.27	0.0208	0.08	0.35	0.12
<i>Panicum</i>	<i>boscii</i>	0.06	0.27	0.026	0.09	0.37	0.12
<i>Panicum</i>	<i>dicantherium</i>	0.06	0.27	0.026	0.09	0.37	0.12
<i>Prunus</i>	<i>caroliniana</i>	0.06	0.27	0.0208	0.08	0.35	0.12
<i>Quercus</i>	<i>lyrata</i>	0.06	0.27	0.026	0.09	0.37	0.12
<i>Scleria</i>	<i>triglomerata</i>	0.04	0.18	0.0521	0.19	0.37	0.12
<i>Symplocus</i>	<i>tinctoria</i>	0.02	0.09	0.0729	0.26	0.36	0.12
<i>Acer</i>	<i>negundo</i>	0.04	0.18	0.0365	0.13	0.32	0.11
<i>Ambrosia</i>	<i>artemusiifolia</i>	0.06	0.27	0.0156	0.06	0.33	0.11
<i>Carex</i>	<i>frankii</i>	0.04	0.18	0.0365	0.13	0.32	0.11
<i>Carex</i>	<i>involucrata</i>	0.04	0.18	0.0417	0.15	0.33	0.11
<i>Dioscorea</i>	<i>villosa</i>	0.04	0.18	0.0365	0.13	0.32	0.11
<i>Ilex</i>	<i>decidua</i>	0.04	0.18	0.0417	0.15	0.33	0.11
<i>Lycopus</i>	<i>species</i>	0.04	0.18	0.0417	0.15	0.33	0.11
<i>Magnolia</i>	<i>granifolia</i>	0.04	0.18	0.0365	0.13	0.32	0.11
<i>Morus</i>	<i>rubra</i>	0.06	0.27	0.0156	0.06	0.33	0.11
<i>Sabatia</i>	<i>campestris</i>	0.06	0.27	0.0156	0.06	0.33	0.11
<i>Sabatia</i>	<i>species</i>	0.06	0.27	0.0156	0.06	0.33	0.11
<i>Carex</i>	<i>louisianica</i>	0.04	0.18	0.0312	0.11	0.3	0.1
Unknown	grass2	0.02	0.09	0.0542	0.2	0.29	0.1
<i>Celtis</i>	<i>laeviagata</i>	0.04	0.18	0.026	0.09	0.28	0.09
<i>Dicanthelium</i>	<i>lanuginosum</i>	0.04	0.18	0.0208	0.08	0.26	0.09
<i>Gymnopogon</i>	<i>ambiguus</i>	0.02	0.09	0.0521	0.19	0.28	0.09
<i>Hypericum</i>	<i>hypericoides</i>	0.02	0.09	0.0469	0.17	0.26	0.09
<i>Juncus</i>	<i>acuminstis</i>	0.02	0.09	0.0521	0.19	0.28	0.09
<i>Ludwigia</i>	<i>species</i>	0.04	0.18	0.0208	0.08	0.26	0.09
<i>Matelea</i>	<i>gonocarpa</i>	0.04	0.18	0.026	0.09	0.28	0.09
<i>Pteridium</i>	<i>aquilinum var. pseudocau</i>	0.04	0.18	0.0208	0.08	0.26	0.09

**Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Rhynchospora</i>	<i>species</i>	0.04	0.18	0.0208	0.08	0.26	0.09
<i>Sagittaria</i>	<i>graminea</i>	0.04	0.18	0.026	0.09	0.28	0.09
<i>Senecio</i>	<i>glabellus</i>	0.04	0.18	0.026	0.09	0.28	0.09
Unknown	herb4	0.04	0.18	0.026	0.09	0.28	0.09
<i>Viola</i>	<i>missouriensis</i>	0.02	0.09	0.0521	0.19	0.28	0.09
<i>Callirhoe</i>	<i>involucrata</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Carex</i>	<i>striatula</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Eleocharis</i>	<i>species</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Justicia</i>	<i>species</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Magnolia</i>	<i>virginiana</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Mikania</i>	<i>scandens</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Myrica</i>	<i>heterophylla</i>	0.02	0.09	0.0417	0.15	0.24	0.08
<i>Oxalis</i>	<i>corniculata</i>	0.02	0.09	0.0417	0.15	0.24	0.08
<i>Quercus</i>	<i>michauxii</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Rubus</i>	<i>species</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Triodanis</i>	<i>perfolia</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Viburnum</i>	<i>dentatum</i>	0.04	0.18	0.0156	0.06	0.24	0.08
<i>Acer</i>	<i>rubrum</i> var. <i>triloba</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Andropogon</i>	<i>virginicus</i>	0.02	0.09	0.0365	0.13	0.22	0.07
<i>Aristolochia</i>	<i>serpentaria</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Botrychium</i>	<i>dissectum</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Carex</i>	<i>lurida</i>	0.02	0.09	0.0312	0.11	0.2	0.07
<i>Cocculus</i>	<i>carolinus</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Crataegus</i>	<i>spathulata</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Dicanthelium</i>	<i>clandestinum</i>	0.02	0.09	0.0312	0.11	0.2	0.07
<i>Eriogonum</i>	<i>annuum</i>	0.02	0.09	0.0312	0.11	0.2	0.07
<i>Galium</i>	<i>species</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Hydrocotyl</i>	<i>verticillata</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Hygrophila</i>	<i>lacustris</i>	0.02	0.09	0.0365	0.13	0.22	0.07
<i>Juncus</i>	<i>species</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Justicia</i>	<i>species</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Lygodium</i>	<i>japonicum</i>	0.02	0.09	0.0365	0.13	0.22	0.07
<i>Ranunculus</i>	<i>hispudus</i>	0.02	0.09	0.0312	0.11	0.2	0.07
<i>Smilax</i>	<i>laurifolia</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Taxodium</i>	<i>distichum</i>	0.04	0.18	0.0104	0.04	0.22	0.07

**Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
Unknown	herb2	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Ulmus</i>	<i>rubra</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Viburnum</i>	<i>acerifolium</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Viola</i>	<i>palmata</i>	0.04	0.18	0.0104	0.04	0.22	0.07
<i>Viola</i>	<i>triloba</i>	0.02	0.09	0.0312	0.11	0.2	0.07
<i>Acer</i>	<i>rubrum</i> var. <i>triloba</i>	0.02	0.09	0.0208	0.08	0.17	0.06
<i>Aralia</i>	<i>spinosa</i>	0.02	0.09	0.0208	0.08	0.17	0.06
<i>Aster</i>	<i>lateriflorus</i>	0.02	0.09	0.026	0.09	0.19	0.06
<i>Gamochaeta</i>	<i>pensylvanica</i>	0.02	0.09	0.026	0.09	0.19	0.06
<i>Juniperus</i>	<i>virginiana</i>	0.02	0.09	0.0208	0.08	0.17	0.06
<i>Pinus</i>	<i>echinata</i>	0.02	0.09	0.0208	0.08	0.17	0.06
<i>Polypremum</i>	<i>procumbens</i>	0.02	0.09	0.0208	0.08	0.17	0.06
<i>Sanicula</i>	<i>canadensis</i>	0.02	0.09	0.0208	0.08	0.17	0.06
<i>Schizachyrium</i>	<i>scoparium</i>	0.02	0.09	0.026	0.09	0.19	0.06
<i>Viburnum</i>	<i>prunifolium</i>	0.02	0.09	0.026	0.09	0.19	0.06
<i>Viburnum</i>	<i>rafinesquianum</i>	0.02	0.09	0.026	0.09	0.19	0.06
<i>Vicia</i>	<i>minutiflora</i>	0.02	0.09	0.026	0.09	0.19	0.06
<i>Viola</i>	species	0.02	0.09	0.026	0.09	0.19	0.06
<i>Athyrium</i>	<i>filix-femina</i>	0.02	0.09	0.0156	0.06	0.15	0.05
<i>Chaerophyllum</i>	<i>tainturieri</i>	0.02	0.09	0.0156	0.06	0.15	0.05
<i>croton</i>	<i>argyranthemus</i>	0.02	0.09	0.0156	0.06	0.15	0.05
<i>Ruellia</i>	species	0.02	0.09	0.0156	0.06	0.15	0.05
<i>Stylosanthes</i>	<i>biflora</i>	0.02	0.09	0.0156	0.06	0.15	0.05
<i>Acer</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Allium</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Arenaria</i>	<i>drummondii</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Arnoglossum</i>	<i>ovatum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Athyrium</i>	<i>filix-femina</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Baccharis</i>	<i>halimifolia</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Bacopa</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Berchemia</i>	<i>scandens</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Berlandiera</i>	<i>betonicifolia</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Bignonia</i>	<i>capreolata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Boehmeria</i>	<i>cylindrica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Botrychium</i>	<i>biterdatum</i>	0.02	0.09	0.0052	0.02	0.11	0.04

Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Brunnichia</i>	<i>ovata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Capsicum</i>	<i>annuum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Carex</i>	<i>blanda</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	<i>caroliniana</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Carex</i>	<i>complanta</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	<i>complanta</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	<i>crebiflora</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	<i>oxlepis</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Carex</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carex</i>	<i>triangularis</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Carex</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carya</i>	<i>aquatica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carya</i>	<i>cordiformis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carya</i>	<i>glabra</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Carya</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Centella</i>	<i>erecta</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Chasmanthium</i>	<i>laxum</i> var. <i>laxum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Chasmanthium</i>	<i>laxum</i> var. <i>sessiliflorum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Chionathus</i>	<i>virginica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Ciclosperma</i>	<i>leptophyllum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Citrus</i>	<i>trifoliata</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Claytonia</i>	<i>virginica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Clitoria</i>	<i>mariana</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Coelorachis</i>	<i>cylindrica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Commelina</i>	<i>virginica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Crataegus</i>	species	0.02	0.09	0.0104	0.04	0.13	0.04
<i>croton</i>	<i>willdenowii</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Dicanthelium</i>	<i>commutatum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Dicanthelium</i>	<i>scoparium</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Dicanthelium</i>	species	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Dysodiopsis</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Eragrostis</i>	<i>elliotti</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Erigeron</i>	<i>philadelphicus</i>	0.02	0.09	0.0052	0.02	0.11	0.04

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Big Sandy Creek Unit, Big Thicket National Preserve**

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<i>Eriogonum</i>	<i>alatum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Eriogonum</i>	<i>annuum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Eupatorium</i>	<i>compositifolium</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Eupatorium</i>	<i>sertinum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Fagus</i>	<i>grandifolia</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Fraxinus</i>	<i>caroliniana</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Fraxinus</i>	<i>species</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Geranium</i>	<i>carolinianum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Gledisia</i>	<i>triacanthos</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Heterotheca</i>	<i>canescens</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Hydrocotyl</i>	<i>umbellata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Hypericum</i>	<i>crus-andreae</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Hypoxis</i>	<i>hirsuta</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Ilex</i>	<i>species</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Ilex</i>	<i>vomitaria</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Iris</i>	<i>virginica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Juncus</i>	<i>coriaceus</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Juncus</i>	<i>tenuis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Juncus</i>	<i>tenuis</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Justicia</i>	<i>ovata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Krigia</i>	<i>cespitosa</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Krigia</i>	<i>cespitosa</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Krigia</i>	<i>cespitosa</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Linum</i>	<i>species</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Lonicera</i>	<i>japonica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Matelea</i>	<i>decipiens</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Matelea</i>	<i>species</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Melica</i>	<i>mutica</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Myosotis</i>	<i>species</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Nyssa</i>	<i>species</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Oxalis</i>	<i>species</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Panicum</i>	<i>aciculare</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Panicum</i>	<i>dicotomum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Panicum</i>	<i>laxiflorum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Paspalum</i>	<i>species</i>	0.02	0.09	0.0052	0.02	0.11	0.04

**Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Parietaria</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Plantago</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Poa</i>	<i>annua</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Poncirus</i>	<i>trifoliata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Prunus</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Pteridium</i>	<i>aquilinum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Quercus</i>	<i>marilandica</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Ranunculus</i>	<i>carolinianus</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Ranunculus</i>	<i>pusillus</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Rhododendron</i>	<i>oblongifolium</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Rhus</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Rhynchospora</i>	<i>divergens</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Rhynchospora</i>	<i>inexpansa</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Rhynchospora</i>	<i>latifolia</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Rubus</i>	<i>argudus</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Rubus</i>	species	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Rubus</i>	<i>trivialis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Sabatia</i>	<i>angularis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Salvia</i>	<i>lyrata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Sambucus</i>	<i>canadensis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Sapium</i>	<i>sebiferum</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Sarracenia</i>	<i>alata</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>scleria</i>	<i>reticularis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Selaginella</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Smilax</i>	species	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Smilax</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Smilax</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Smilax</i>	<i>tamnoides</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Solanum</i>	<i>carolinense</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Solidago</i>	species	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Stachys</i>	<i>tenuifolia</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Styrax</i>	<i>americana</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Ptilimnium</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Thelypteris</i>	<i>kunthii</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Trachelosperum</i>	<i>difforme</i>	0.02	0.09	0.0052	0.02	0.11	0.04

Table 1A. Summary of the Herbaceous Stratum in All Alliances in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Trepocarpus</i>	<i>aethusae</i>	0.02	0.09	0.0052	0.02	0.11	0.04
Unknown	grass1	0.02	0.09	0.0052	0.02	0.11	0.04
Unknown	herb1	0.02	0.09	0.0052	0.02	0.11	0.04
Unknown	herb3	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Ulmus</i>	<i>alata</i>	0.02	0.09	0.0104	0.04	0.13	0.04
<i>Ulmus</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Viburnum</i>	<i>rufidulum</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Vitis</i>	<i>aestivalis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Vitis</i>	<i>aestivalis</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Vitis</i>	<i>cinerea</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Vitis</i>	<i>riparia</i>	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Woodwardia</i>	species	0.02	0.09	0.0052	0.02	0.11	0.04
<i>Zizia</i>	<i>aurea</i>	0.02	0.09	0.0104	0.04	0.13	0.04
Totals			100	27.685	100	200	66.67

**Table 2D. Summary of the Woody Strata in the *Nyssa aquatica* - *Taxodium distichum* Semi-Permanently Flooded Forest Alliance
in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
Shrub Class									
<i>Sebastiana</i>	<i>fruticosa</i>	0.17	11.11	200	31.25	0.0105	19.66	62.02	20.67
<i>Liquidambar</i>	<i>styraciflua</i>	0.17	11.11	66.6667	10.42	0.0209	39.31	60.84	20.28
<i>Berchemia</i>	<i>scandens</i>	0.17	11.11	133.3333	20.83	0.0065	12.29	44.23	14.74
<i>Viburnum</i>	<i>nudum</i>	0.17	11.11	66.6667	10.42	0.0065	12.29	33.81	11.27
<i>Parthenocissus</i>	<i>quinquefolia</i>	0.17	11.11	66.6667	10.42	0.0052	9.83	31.36	10.45
<i>Toxicodendron</i>	<i>radicans</i>	0.17	11.11	66.6667	10.42	0.0013	2.46	23.98	7.99
<i>Myrica</i>	<i>heterophylla</i>	0.17	11.11	20	3.13	0.0004	0.74	14.97	4.99
<i>Myrica</i>	<i>cerifera</i>	0.17	11.11	13.3333	2.08	0.0007	1.23	14.42	4.81
<i>Symplocos</i>	<i>tinctoria</i>	0.17	11.11	6.6667	1.04	0.0012	2.21	14.36	4.79
Totals			100	640	100	0.0533	100	300	100
Midstory Class									
<i>Fraxinus</i>	<i>caroliniana</i>	0.17	2.56	206.6667	25.41	1.1126	33.06	61.03	20.34
<i>Nyssa</i>	<i>biflora</i>	0.83	12.82	126.6667	15.57	0.5113	15.19	43.59	14.53
<i>Carpinus</i>	<i>caroliniana</i>	0.67	10.26	133.3333	16.39	0.5676	16.86	43.51	14.5
<i>Ilex</i>	<i>opaca</i>	0.5	7.69	60	7.38	0.2204	6.55	21.62	7.21
<i>Liquidambar</i>	<i>styraciflua</i>	0.5	7.69	40	4.92	0.1634	4.85	17.46	5.82
<i>Ilex</i>	<i>vomitaria</i>	0.5	7.69	46.6667	5.74	0.0454	1.35	14.78	4.93
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	0.33	5.13	13.3333	1.64	0.1479	4.4	11.16	3.72
<i>Fraxinus</i>	<i>pensylvanica</i>	0.33	5.13	20	2.46	0.1128	3.35	10.94	3.65
<i>Nyssa</i>	<i>aquatica</i>	0.17	2.56	20	2.46	0.1066	3.17	8.19	2.73
<i>Magnolia</i>	<i>virginiana</i>	0.17	2.56	26.6667	3.28	0.0391	1.16	7.01	2.34
<i>Celtis</i>	<i>occidentalis</i>	0.17	2.56	13.3333	1.64	0.0545	1.62	5.82	1.94
<i>Ulmus</i>	<i>americana</i>	0.17	2.56	13.3333	1.64	0.0359	1.07	5.27	1.76
<i>Planera</i>	<i>aquatica</i>	0.17	2.56	6.6667	0.82	0.042	1.25	4.63	1.54
<i>Styrax</i>	<i>americana</i>	0.17	2.56	6.6667	0.82	0.0386	1.15	4.53	1.51
<i>Acer</i>	<i>rubrum</i>	0.17	2.56	6.6667	0.82	0.0378	1.12	4.51	1.5
<i>Parthenocissus</i>	<i>quinquefolia</i>	0.17	2.56	13.3333	1.64	0.0065	0.19	4.4	1.47
<i>Vitis</i>	<i>rotundifolia</i>	0.17	2.56	13.3333	1.64	0.0065	0.19	4.4	1.47
<i>Acer</i>	<i>rubrum</i> var. <i>trilobum</i>	0.17	2.56	6.6667	0.82	0.0257	0.76	4.15	1.38
<i>Taxodium</i>	<i>distichum</i>	0.17	2.56	6.6667	0.82	0.0257	0.76	4.15	1.38
<i>Ulmus</i>	<i>alata</i>	0.17	2.56	6.6667	0.82	0.0257	0.76	4.15	1.38
<i>Toxicodendron</i>	<i>radicans</i>	0.17	2.56	6.6667	0.82	0.0188	0.56	3.94	1.31
<i>Myrica</i>	<i>heterophylla</i>	0.17	2.56	6.6667	0.82	0.0122	0.36	3.75	1.25
<i>Rhodoendron</i>	<i>oblongifolium</i>	0.17	2.56	6.6667	0.82	0.0038	0.11	3.5	1.17
<i>Sapium</i>	<i>sebiferum</i>	0.17	2.56	6.6667	0.82	0.0047	0.14	3.52	1.17

**Table 2D. Summary of the Woody Strata in the *Nyssa aquatica* - *Taxodium distichum* Semi-Permanently Flooded Forest Alliance
in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
Totals			100	813.3333	100	3.3656	100	300	100
Overstory Class									
<i>Nyssa</i>	<i>aquatica</i>	0.5	11.11	146.6667	23.66	19.1989	32.55	67.32	22.44
<i>Nyssa</i>	<i>biflora</i>	0.83	18.52	106.6667	17.2	11.0735	18.77	54.5	18.17
<i>Taxodium</i>	<i>distichum</i>	0.67	14.81	93.3333	15.05	14	23.74	53.6	17.87
<i>Liquidambar</i>	<i>styraciflua</i>	0.67	14.81	60	9.68	2.9693	5.03	29.53	9.84
<i>Fraxinus</i>	<i>caroliniana</i>	0.17	3.7	86.6667	13.98	2.5813	4.38	22.06	7.35
<i>Carpinus</i>	<i>caroliniana</i>	0.5	11.11	46.6667	7.53	1.5784	2.68	21.31	7.1
<i>Magnolia</i>	<i>virginiana</i>	0.17	3.7	26.6667	4.3	2.9632	5.02	13.03	4.34
<i>Quercus</i>	<i>laurifolia</i>	0.17	3.7	13.3333	2.15	2.3819	4.04	9.89	3.3
<i>Quercus</i>	<i>nigra</i>	0.17	3.7	13.3333	2.15	0.9002	1.53	7.38	2.46
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	0.17	3.7	6.6667	1.08	0.7173	1.22	6	2
<i>Acer</i>	<i>rubrum</i>	0.17	3.7	6.6667	1.08	0.22	0.37	5.15	1.72
<i>Ulmus</i>	<i>alata</i>	0.17	3.7	6.6667	1.08	0.22	0.37	5.15	1.72
<i>Ulmus</i>	<i>crassifolia</i>	0.17	3.7	6.6667	1.08	0.1792	0.3	5.08	1.69
Totals			100	620	100	58.9833	100	300	100

**Table 3D. Summary of the Woody Strata in the *Fraxinus pennsylvanica* - *Ulmus americana* - *Celtis (occidentalis, laevigata)*
Temporarily Flooded Forest Alliance in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
Shrub Class									
No shrubs recorded									
Midstory Class									
<i>Fraxinus</i>	<i>pennsylvanica</i>	1	14.29	3639.9999	91.92	7.6568	84.41	190.61	63.54
<i>Liquidambar</i>	<i>styraciflua</i>	1	14.29	120	3.03	1.0132	11.17	28.48	9.49
<i>Carya</i>	<i>aquatica</i>	1	14.29	40	1.01	0.1539	1.7	16.99	5.66
<i>Ulmus</i>	<i>rubra</i>	1	14.29	40	1.01	0.0785	0.87	16.16	5.39
<i>Sapium</i>	<i>sebiferum</i>	1	14.29	40	1.01	0.0636	0.7	16	5.33
<i>Celtis</i>	<i>laevigata</i>	1	14.29	40	1.01	0.0636	0.7	16	5.33
<i>Poncirus</i>	<i>trifoliata</i>	1	14.29	40	1.01	0.0416	0.46	15.75	5.25
Totals			100	3959.9999	100	9.0713	100	300	100
Overstory Class									
<i>Fraxinus</i>	<i>pennsylvanica</i>	1	33.33	240	75	4.2773	73.73	182.07	60.69
<i>Ulmus</i>	<i>rubra</i>	1	33.33	40	12.5	0.9079	15.65	61.48	20.49
<i>Liquidambar</i>	<i>styraciflua</i>	1	33.33	40	12.5	0.6158	10.61	56.45	18.82
Totals			100	320	100	5.801	100	300	100

**Table 4D. Summary of the Woody Strata in the *Quercus alba* - (*Quercus nigra*) Seasonally Flooded Forest Alliance
in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
Shrub Class									
<i>Ilex</i>	<i>vomitorea</i>	0.78	25	2044.4444	53.43	0.2086	69.99	148.41	49.47
<i>Persea</i>	<i>palustris</i>	0.33	10.71	488.8889	12.78	0.0183	6.15	29.64	9.88
<i>Ostrya</i>	<i>virginiana</i>	0.22	7.14	177.7778	4.65	0.0323	10.83	22.62	7.54
<i>Ilex</i>	<i>opaca</i>	0.33	10.71	222.2222	5.81	0.0044	1.46	17.99	6
<i>Liquidambar</i>	<i>styraciflua</i>	0.22	7.14	177.7778	4.65	0.0131	4.39	16.18	5.39
<i>Quercus</i>	<i>laurifolia</i>	0.22	7.14	133.3333	3.48	0.0026	0.88	11.51	3.84
<i>Persia</i>	<i>borbonia</i>	0.11	3.57	177.7778	4.65	0.0035	1.17	9.39	3.13
<i>Symplocos</i>	<i>tinctoria</i>	0.11	3.57	88.8889	2.32	0.0044	1.46	7.36	2.45
<i>Callicarpa</i>	<i>americana</i>	0.11	3.57	88.8889	2.32	0.0017	0.59	6.48	2.16
<i>Magnolia</i>	<i>grandiflora</i>	0.11	3.57	44.4444	1.16	0.0035	1.17	5.9	1.97
<i>Bidens</i>	<i>mitis</i>	0.11	3.57	44.4444	1.16	0.0009	0.29	5.03	1.68
<i>Gelsemium</i>	<i>sempervirens</i>	0.11	3.57	44.4444	1.16	0.0009	0.29	5.03	1.68
<i>Nyssa</i>	<i>biflora</i>	0.11	3.57	44.4444	1.16	0.0009	0.29	5.03	1.68
<i>Sebastiania</i>	<i>fruticosa</i>	0.11	3.57	44.4444	1.16	0.0009	0.29	5.03	1.68
<i>Fraxinus</i>	<i>americana</i>	0.11	3.57	4.4444	0.12	0.0022	0.73	4.42	1.47
Totals			100	3826.6666	100	0.298	100	300	100
Midstory Class									
<i>Ilex</i>	<i>vomitorea</i>	0.89	10.81	582.2222	44.11	0.8701	28.5	83.42	27.81
<i>Nyssa</i>	<i>sylvatica</i>	0.89	10.81	97.7778	7.41	0.3059	10.02	28.24	9.41
<i>Pinus</i>	<i>taeda</i>	0.22	2.7	120	9.09	0.3431	11.24	23.03	7.68
<i>Ostrya</i>	<i>virginiana</i>	0.56	6.76	66.6667	5.05	0.2788	9.13	20.94	6.98
<i>Ilex</i>	<i>opaca</i>	0.56	6.76	57.7778	4.38	0.1523	4.99	16.12	5.37
<i>Quercus</i>	<i>alba</i>	0.44	5.41	44.4444	3.37	0.1936	6.34	15.11	5.04
<i>Callicarpa</i>	<i>americana</i>	0.22	2.7	62.2222	4.71	0.1728	5.66	13.08	4.36
<i>Liquidambar</i>	<i>styraciflua</i>	0.44	5.41	40	3.03	0.0945	3.1	11.53	3.84
<i>Cornus</i>	<i>florida</i>	0.33	4.05	26.6667	2.02	0.1051	3.44	9.52	3.17
<i>Chionanthus</i>	<i>virginica</i>	0.33	4.05	17.7778	1.35	0.0979	3.21	8.61	2.87
<i>Quercus</i>	<i>falcata</i>	0.22	2.7	22.2222	1.68	0.0846	2.77	7.16	2.39
<i>Quercus</i>	<i>hemispherica</i>	0.22	2.7	31.1111	2.36	0.0546	1.79	6.85	2.28
<i>Vitis</i>	<i>rotundifolia</i>	0.33	4.05	17.7778	1.35	0.0097	0.32	5.72	1.91
<i>Ulmus</i>	<i>alata</i>	0.22	2.7	8.8889	0.67	0.0371	1.21	4.59	1.53
<i>Vaccinium</i>	<i>arboreum</i>	0.22	2.7	13.3333	1.01	0.0249	0.81	4.53	1.51
<i>Fagus</i>	<i>grandifolia</i>	0.22	2.7	8.8889	0.67	0.0305	1	4.37	1.46

**Table 4D. Summary of the Woody Strata in the *Quercus alba* - (*Quercus nigra*) Seasonally Flooded Forest Alliance
in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Persea</i>	<i>palustris</i>	0.22	2.7	13.3333	1.01	0.0173	0.57	4.28	1.43
<i>Acer</i>	<i>rubrum</i>	0.22	2.7	8.8889	0.67	0.0239	0.78	4.16	1.39
<i>Prunus</i>	<i>serotina</i>	0.22	2.7	13.3333	1.01	0.0109	0.36	4.07	1.36
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	0.11	1.35	13.3333	1.01	0.0135	0.44	2.8	0.93
<i>Acer</i>	<i>barbatum</i>	0.11	1.35	13.3333	1.01	0.0075	0.25	2.61	0.87
<i>Fraxinus</i>	<i>americana</i>	0.11	1.35	4.4444	0.34	0.0283	0.93	2.61	0.87
<i>Magnolia</i>	<i>grandiflora</i>	0.11	1.35	4.4444	0.34	0.0283	0.93	2.61	0.87
<i>Ulmus</i>	<i>rubra</i>	0.11	1.35	4.4444	0.34	0.0171	0.56	2.25	0.75
<i>Viburnum</i>	<i>rufidulum</i>	0.11	1.35	4.4444	0.34	0.0157	0.51	2.2	0.73
<i>Quercus</i>	<i>michauxii</i>	0.11	1.35	4.4444	0.34	0.0126	0.41	2.1	0.7
<i>Nyssa</i>	<i>biflora</i>	0.11	1.35	4.4444	0.34	0.0106	0.35	2.03	0.68
<i>Quercus</i>	<i>falcata</i> var. <i>pogodaefolia</i>	0.11	1.35	4.4444	0.34	0.0056	0.18	1.87	0.62
<i>Quercus</i>	<i>laurifolia</i>	0.11	1.35	4.4444	0.34	0.0043	0.14	1.83	0.61
<i>Hamamelis</i>	<i>virginiana</i>	0.11	1.35	4.4444	0.34	0.0022	0.07	1.76	0.59
Totals			100	1320	100	3.0532	100	300	100
Overstory Class									
<i>Quercus</i>	<i>alba</i>	0.78	15.91	124.4444	30.11	5.7042	20.83	66.85	22.28
<i>Liquidambar</i>	<i>styraciflua</i>	0.56	11.36	62.2222	15.05	4.5215	16.51	42.93	14.31
<i>Nyssa</i>	<i>sylvatica</i>	0.44	9.09	53.3333	12.9	3.6683	13.4	35.39	11.8
<i>Pinus</i>	<i>taeda</i>	0.44	9.09	31.1111	7.53	4.3037	15.72	32.33	10.78
<i>Acer</i>	<i>rubrum</i>	0.33	6.82	26.6667	6.45	0.9479	3.46	16.73	5.58
<i>Ostrya</i>	<i>virginiana</i>	0.44	9.09	22.2222	5.38	0.4671	1.71	16.17	5.39
<i>Quercus</i>	<i>falcata</i> var. <i>pogodaefolia</i>	0.33	6.82	13.3333	3.23	1.189	4.34	14.39	4.8
<i>Ulmus</i>	<i>rubra</i>	0.11	2.27	4.4444	1.08	1.6379	5.98	9.33	3.11
<i>Ilex</i>	<i>opaca</i>	0.22	4.55	13.3333	3.23	0.2863	1.05	8.82	2.94
<i>Quercus</i>	<i>phellos</i>	0.11	2.27	8.8889	2.15	1.0675	3.9	8.32	2.77
<i>Callicarpa</i>	<i>americana</i>	0.22	4.55	8.8889	2.15	0.3373	1.23	7.93	2.64
<i>Quercus</i>	<i>laurifolia</i>	0.11	2.27	4.4444	1.08	0.9621	3.51	6.86	2.29
<i>Quercus</i>	<i>michauxii</i>	0.11	2.27	4.4444	1.08	0.7386	2.7	6.05	2.02
<i>Quercus</i>	<i>hemispherica</i>	0.11	2.27	8.8889	2.15	0.2405	0.88	5.3	1.77
<i>Quercus</i>	<i>nigra</i>	0.11	2.27	8.8889	2.15	0.2351	0.86	5.28	1.76
<i>Quercus</i>	<i>falcata</i>	0.11	2.27	4.4444	1.08	0.4035	1.47	4.82	1.61
<i>Quercus</i>	species	0.11	2.27	4.4444	1.08	0.3917	1.43	4.78	1.59
<i>Pinus</i>	<i>echinata</i>	0.11	2.27	4.4444	1.08	0.1539	0.56	3.91	1.3

**Table 4D. Summary of the Woody Strata in the *Quercus alba* - (*Quercus nigra*) Seasonally Flooded Forest Alliance
in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Carya</i>	<i>tomentosa</i>	0.11	2.27	4.4444	1.08	0.126	0.46	3.81	1.27
Totals			100	413.3333	100	27.3823	100	300	100

**Table 5A. Summary of the Herbaceous Stratum in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance
in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Ilex</i>	<i>vomitorea</i>	0.78	3.39	1.9306	7.35	10.74	3.58
<i>Quercus</i>	<i>laurifolia</i>	0.5	2.18	2.0139	7.66	9.84	3.28
<i>Chasmanthium</i>	<i>latifolium</i>	0.22	0.97	2.015	7.67	8.64	2.88
<i>Ilex</i>	<i>coriacea</i>	0.17	0.73	1.5	5.71	6.43	2.14
<i>Persea</i>	<i>palustris</i>	0.61	2.66	0.9167	3.49	6.15	2.05
<i>Mitchella</i>	<i>repens</i>	0.5	2.18	0.7917	3.01	5.19	1.73
<i>Vitis</i>	<i>rotundifolia</i>	0.61	2.66	0.6528	2.48	5.15	1.72
<i>Arundinaria</i>	<i>gigantea</i>	0.17	0.73	1.0278	3.91	4.64	1.55
<i>Smilax</i>	<i>glauca</i>	0.61	2.66	0.5	1.9	4.57	1.52
<i>Callicarpa</i>	<i>americana</i>	0.61	2.66	0.4861	1.85	4.51	1.5
<i>Parthenocissus</i>	<i>quinquefolia</i>	0.44	1.94	0.4583	1.74	3.68	1.23
<i>Acer</i>	<i>rubrum</i>	0.61	2.66	0.25	0.95	3.61	1.2
<i>Sebastiania</i>	<i>fruticosa</i>	0.17	0.73	0.7222	2.75	3.47	1.16
<i>Quercus</i>	<i>nigra</i>	0.39	1.69	0.4167	1.59	3.28	1.09
<i>Rhodoendron</i>	<i>oblongifolium</i>	0.06	0.24	0.7917	3.01	3.25	1.08
<i>Ilex</i>	<i>opaca</i>	0.44	1.94	0.3194	1.22	3.15	1.05
<i>Smilax</i>	<i>smallii</i>	0.5	2.18	0.25	0.95	3.13	1.04
<i>Vaccinium</i>	<i>arboreum</i>	0.11	0.48	0.6806	2.59	3.07	1.02
<i>Vaccinium</i>	<i>corymbosum</i>	0.22	0.97	0.4444	1.69	2.66	0.89
<i>Smilax</i>	<i>pumila</i>	0.39	1.69	0.2222	0.85	2.54	0.85
<i>Toxicodendron</i>	<i>radicans</i>	0.28	1.21	0.3333	1.27	2.48	0.83
<i>Smilax</i>	<i>tamnoides</i>	0.39	1.69	0.1389	0.53	2.22	0.74
<i>Myrica</i>	<i>heterophylla</i>	0.11	0.48	0.4167	1.59	2.07	0.69
<i>Polygonum</i>	<i>virginianum</i>	0.06	0.24	0.4583	1.74	1.99	0.66
<i>Sassafras</i>	<i>albidum</i>	0.33	1.45	0.1111	0.42	1.88	0.63
<i>Chasmanthium</i>	<i>laxum</i>	0.22	0.97	0.2361	0.9	1.87	0.62
<i>Bignonia</i>	<i>capreolata</i>	0.28	1.21	0.1667	0.63	1.84	0.61
<i>Ostrya</i>	<i>virginiana</i>	0.22	0.97	0.2083	0.79	1.76	0.59
<i>Vaccinium</i>	<i>species</i>	0.22	0.97	0.1806	0.69	1.66	0.55
<i>Berchemia</i>	<i>scandens</i>	0.28	1.21	0.0972	0.37	1.58	0.53
<i>Carex</i>	<i>corrugata</i>	0.17	0.73	0.2083	0.79	1.52	0.51
<i>Gelsemium</i>	<i>sempervirens</i>	0.22	0.97	0.1389	0.53	1.5	0.5
<i>Boehmeria</i>	<i>cylindrica</i>	0.17	0.73	0.1944	0.74	1.47	0.49
<i>Leersia</i>	<i>lenticularis</i>	0.17	0.73	0.1806	0.69	1.41	0.47

**Table 5A. Summary of the Herbaceous Stratum in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance
in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Scleria</i>	<i>oligantha</i>	0.22	0.97	0.1111	0.42	1.39	0.46
<i>Carex</i>	<i>caroliniana</i>	0.22	0.97	0.0833	0.32	1.29	0.43
<i>Justicia</i>	<i>ovata</i> var. <i>lanceolata</i>	0.11	0.48	0.2083	0.79	1.28	0.43
<i>Carex</i>	<i>abscondita</i>	0.17	0.73	0.125	0.48	1.2	0.4
<i>Carex</i>	<i>nigromarginata</i>	0.17	0.73	0.1111	0.42	1.15	0.38
<i>Prunus</i>	<i>serotina</i>	0.17	0.73	0.1111	0.42	1.15	0.38
<i>Quercus</i>	<i>alba</i>	0.17	0.73	0.1111	0.42	1.15	0.38
<i>Scleria</i>	<i>species</i>	0.17	0.73	0.1111	0.42	1.15	0.38
<i>Arenaria</i>	<i>drummondii</i>	0.17	0.73	0.0972	0.37	1.1	0.37
<i>Poa</i>	<i>autumnalis</i>	0.11	0.48	0.1667	0.63	1.12	0.37
<i>Quercus</i>	<i>phellos</i>	0.17	0.73	0.0833	0.32	1.04	0.35
<i>Scleria</i>	<i>triglomerata</i>	0.11	0.48	0.1389	0.53	1.01	0.34
<i>Panicum</i>	<i>commutatum</i>	0.17	0.73	0.0694	0.26	0.99	0.33
<i>Saccharum</i>	<i>baldwinii</i>	0.17	0.73	0.0694	0.26	0.99	0.33
<i>Elephantopus</i>	<i>carolinianus</i>	0.11	0.48	0.125	0.48	0.96	0.32
<i>Viola</i>	<i>sororia</i>	0.11	0.48	0.125	0.48	0.96	0.32
<i>Chasmanthium</i>	<i>sessiliflorum</i>	0.17	0.73	0.0556	0.21	0.94	0.31
<i>Hamamelis</i>	<i>virginiana</i>	0.11	0.48	0.1111	0.42	0.91	0.3
<i>Rubus</i>	<i>trivialis</i>	0.11	0.48	0.1111	0.42	0.91	0.3
<i>Liquidambar</i>	<i>styraciflua</i>	0.17	0.73	0.0417	0.16	0.88	0.29
<i>Pinus</i>	<i>taeda</i>	0.17	0.73	0.0417	0.16	0.88	0.29
<i>Smilax</i>	<i>rotundifolia</i>	0.17	0.73	0.0417	0.16	0.88	0.29
<i>Vaccinium</i>	<i>stamineum</i>	0.06	0.24	0.1667	0.63	0.88	0.29
<i>Acer</i>	<i>negundo</i>	0.11	0.48	0.0972	0.37	0.85	0.28
<i>Magnolia</i>	<i>grandifolia</i>	0.11	0.48	0.0972	0.37	0.85	0.28
<i>Saururus</i>	<i>cernuus</i>	0.11	0.48	0.0972	0.37	0.85	0.28
<i>Carex</i>	<i>tribuloides</i>	0.11	0.48	0.0833	0.32	0.8	0.27
<i>Viola</i>	<i>missouriensis</i>	0.06	0.24	0.1389	0.53	0.77	0.26
<i>Matelea</i>	<i>gonocarpa</i>	0.11	0.48	0.0694	0.26	0.75	0.25
Unknown	herb species	0.11	0.48	0.0694	0.26	0.75	0.25
<i>Allium</i>	<i>canadense</i>	0.06	0.24	0.125	0.48	0.72	0.24
<i>Viola</i>	<i>lanceolata</i> s. <i>vittata</i>	0.06	0.24	0.125	0.48	0.72	0.24
<i>Brunnichia</i>	<i>ovata</i>	0.11	0.48	0.0556	0.21	0.7	0.23
<i>Carex</i>	<i>caroliniana</i>	0.11	0.48	0.0556	0.21	0.7	0.23

**Table 5A. Summary of the Herbaceous Stratum in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance
in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Galium</i>	<i>trifidum</i>	0.11	0.48	0.0556	0.21	0.7	0.23
<i>Oxalis</i>	<i>stricta</i>	0.11	0.48	0.0556	0.21	0.7	0.23
<i>Quercus</i>	<i>lyrata</i>	0.11	0.48	0.0556	0.21	0.7	0.23
<i>Oxalis</i>	<i>corniculata</i>	0.06	0.24	0.1111	0.42	0.66	0.22
<i>Callirhoe</i>	<i>involucrata</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Carex</i>	<i>longii</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Carex</i>	<i>striatula</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Magnolia</i>	<i>virginiana</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Myrica</i>	<i>cerifera</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Onoclea</i>	<i>sensibilis</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Oplismenus</i>	<i>hirtellus</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Viburnum</i>	<i>dentatum</i>	0.11	0.48	0.0417	0.16	0.64	0.21
<i>Carex</i>	<i>blanda</i>	0.11	0.48	0.0278	0.11	0.59	0.2
<i>Carex</i>	<i>nigromarginata</i>	0.11	0.48	0.0278	0.11	0.59	0.2
<i>Hydrocotyl</i>	<i>verticillata</i>	0.11	0.48	0.0278	0.11	0.59	0.2
<i>Nyssa</i>	<i>sylvatica</i>	0.11	0.48	0.0278	0.11	0.59	0.2
<i>Sabatia</i>	<i>campestris</i>	0.11	0.48	0.0278	0.11	0.59	0.2
<i>Viola</i>	<i>palmata</i>	0.11	0.48	0.0278	0.11	0.59	0.2
<i>Panicum</i>	<i>clandestinum</i>	0.06	0.24	0.0833	0.32	0.56	0.19
<i>Ranunculus</i>	<i>hispudis</i>	0.06	0.24	0.0833	0.32	0.56	0.19
<i>Viola</i>	<i>triloba</i>	0.06	0.24	0.0833	0.32	0.56	0.19
<i>Carex</i>	<i>basiantha</i>	0.06	0.24	0.0694	0.26	0.51	0.17
<i>Carya</i>	<i>leiodermis</i>	0.06	0.24	0.0694	0.26	0.51	0.17
<i>Ilex</i>	<i>decidua</i>	0.06	0.24	0.0694	0.26	0.51	0.17
<i>Nyssa</i>	<i>biflora</i>	0.06	0.24	0.0694	0.26	0.51	0.17
<i>Viburnum</i>	<i>rafinesquianum</i>	0.06	0.24	0.0694	0.26	0.51	0.17
<i>Acer</i>	<i>rubrum</i> var. <i>triloba</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Aralia</i>	<i>spinosa</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Asimina</i>	<i>parviflora</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Carex</i>	<i>lurida</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Carex</i>	<i>species</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Carya</i>	<i>texana</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Celtis</i>	<i>laevigata</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Myosotis</i>	<i>macrosperma</i>	0.06	0.24	0.0556	0.21	0.45	0.15

**Table 5A. Summary of the Herbaceous Stratum in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance
in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Parthenium</i>	<i>hysterophorus</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Sanicula</i>	<i>canadensis</i>	0.06	0.24	0.0556	0.21	0.45	0.15
<i>Acer</i>	<i>barbatum</i>	0.06	0.24	0.0417	0.16	0.4	0.13
<i>Chaerophyllum</i>	<i>tainturieri</i>	0.06	0.24	0.0417	0.16	0.4	0.13
<i>Sagittaria</i>	<i>graminea</i>	0.06	0.24	0.0417	0.16	0.4	0.13
<i>Ascyrum</i>	<i>hypericoides</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Capsicum</i>	<i>annuum</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Carex</i>	<i>oxylepis</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Carex</i>	<i>triangularis</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Poncirus</i>	<i>trifoliata</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Eleocharis</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Eupatorium</i>	<i>serotinum</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Oxalis</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Panicum</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Pteridium</i>	<i>aquilinum</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Pteridium</i>	<i>aquilinum</i> var. <i>pseudocaudatum</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Quercus</i>	<i>michauxii</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Quercus</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Rhamnus</i>	<i>caroliniana</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Rubus</i>	<i>argudus</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Rubus</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Sapium</i>	<i>sebiferum</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Scleria</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Scleria</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Smilax</i>	<i>species</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Thelypteris</i>	<i>kunthii</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Zizia</i>	<i>aurea</i>	0.06	0.24	0.0278	0.11	0.35	0.12
<i>Ambrosia</i>	<i>artemisiifolia</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Arisaema</i>	<i>dracontium</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Arundinaria</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Bidens</i>	<i>bipinnata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Botrychium</i>	<i>dissectum</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Brunnichia</i>	<i>ovata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Campsis</i>	<i>radicans</i>	0.06	0.24	0.0139	0.05	0.29	0.1

**Table 5A. Summary of the Herbaceous Stratum in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance
in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Carex</i>	<i>debilis</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carex</i>	<i>digitalis</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carex</i>	<i>flaccosperma</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carex</i>	<i>frankii</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carex</i>	<i>leptalea</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carex</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carex</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Carya</i>	<i>cordiformis</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Centella</i>	<i>erecta</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Claytonia</i>	<i>virginica</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Cocculus</i>	<i>carolinus</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Commelina</i>	<i>virginica</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Croton</i>	<i>willdenowii</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Dysodiopsis</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Elephantopus</i>	<i>tomentosus</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Fagus</i>	<i>grandifolia</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Fraxinus</i>	<i>pensylvanica</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Germanium</i>	<i>carolinianum</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Hydrocotyl</i>	<i>umbellata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Hyptis</i>	<i>alata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Ilex</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Justicia</i>	<i>ovata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Lonicera</i>	<i>japonica</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Melica</i>	<i>mutica</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Morus</i>	<i>rubra</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Panicum</i>	<i>boscii</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Panicum</i>	<i>capillare</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Panicum</i>	<i>laxiflorum</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Paspalum</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Poa</i>	<i>annua</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Polygonum</i>	<i>punctatum</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Poncirus</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Quercus</i>	<i>falcata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Sabatia</i>	<i>angularis</i>	0.06	0.24	0.0139	0.05	0.29	0.1

**Table 5A. Summary of the Herbaceous Stratum in the *Quercus (laurifolia, phellos)* Seasonally Flooded Forest Alliance
in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Sabatia</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Salvia</i>	<i>lyrata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Sambucus</i>	<i>canadensis</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Senecio</i>	<i>glabellus</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Smilax</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Smilax</i>	<i>species</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Trachelospermum</i>	<i>difforme</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Ulmus</i>	<i>rubra</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Viburnum</i>	<i>acerifolium</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Vitis</i>	<i>riparia</i>	0.06	0.24	0.0139	0.05	0.29	0.1
<i>Woodwardia</i>	<i>areolata</i>	0.06	0.24	0.0139	0.05	0.29	0.1
Totals			100	26.2789	100	200	66.67

**Table 6A. Summary of the Herbaceous Stratum in the *Magnolia virginiana* - *Nyssa biflora* (*Quercus laurifolia*)
Saturated Forest Alliance in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Sphagnum</i>	<i>species</i>	0.5	2.22	13.5	25.78	28	9.33
<i>Juncus</i>	<i>effusus</i>	0.5	2.22	10.375	19.81	22.03	7.34
<i>Myrica</i>	<i>heterophylla</i>	1	4.44	5.5	10.5	14.95	4.98
<i>Rhodoendrom</i>	<i>oblongifolium</i>	1	4.44	1.875	3.58	8.02	2.67
<i>Rubus</i>	<i>argudus</i>	0.5	2.22	2.75	5.25	7.47	2.49
<i>Itea</i>	<i>virginica</i>	1	4.44	1.25	2.39	6.83	2.28
<i>Carex</i>	<i>atlantica</i>	0.5	2.22	2.375	4.53	6.76	2.25
<i>Woodwardia</i>	<i>areolata</i>	0.5	2.22	2.25	4.3	6.52	2.17
<i>Carex</i>	<i>leavenworthii</i>	1	4.44	0.75	1.43	5.88	1.96
<i>Viola</i>	<i>pruniflorum</i>	0.5	2.22	1.5	2.86	5.09	1.7
<i>Myrica</i>	<i>species</i>	0.5	2.22	1	1.91	4.13	1.38
<i>Ilex</i>	<i>coriacea</i>	0.5	2.22	1	1.91	4.13	1.38
<i>Saururus</i>	<i>cernuus</i>	0.5	2.22	0.875	1.67	3.89	1.3
<i>Lycopus</i>	<i>species</i>	0.5	2.22	0.875	1.67	3.89	1.3
<i>Chasmanthium</i>	<i>laxum</i>	0.5	2.22	0.875	1.67	3.89	1.3
<i>Carex</i>	<i>lupulina</i>	0.5	2.22	0.75	1.43	3.65	1.22
<i>Carex</i>	<i>debilis</i>	0.5	2.22	0.625	1.19	3.42	1.14
<i>Vitis</i>	<i>rotundifolia</i>	0.5	2.22	0.5	0.95	3.18	1.06
<i>Ludwigia</i>	<i>species</i>	0.5	2.22	0.375	0.72	2.94	0.98
<i>Boehmeria</i>	<i>cylindrica</i>	0.5	2.22	0.375	0.72	2.94	0.98
<i>Rhododendron</i>	<i>oblongifolium</i>	0.5	2.22	0.25	0.48	2.7	0.9
<i>Smilax</i>	<i>smallii</i>	0.5	2.22	0.25	0.48	2.7	0.9
<i>Baccharis</i>	<i>halimifolia</i>	0.5	2.22	0.25	0.48	2.7	0.9
<i>Viburnum</i>	<i>nudum</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Triadenum</i>	<i>walteri</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Toxicodendron</i>	<i>radicans</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Telimum</i>	<i>species</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Stachys</i>	<i>tenuifolia</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Smilax</i>	<i>laurifolia</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Smilax</i>	<i>tamnoides</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Smilax</i>	<i>walteri</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Rubus</i>	<i>argudus</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Rhynchospora</i>	<i>species</i>	0.5	2.22	0.125	0.24	2.46	0.82

**Table 6A. Summary of the Herbaceous Stratum in the *Magnolia virginiana* - *Nyssa biflora* (*Quercus laurifolia*)
Saturated Forest Alliance in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Juncus</i>	species	0.5	2.22	0.125	0.24	2.46	0.82
<i>Eleocharis</i>	species	0.5	2.22	0.125	0.24	2.46	0.82
<i>Carya</i>	<i>texana</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Berchemia</i>	<i>scandens</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Bacopa</i>	species	0.5	2.22	0.125	0.24	2.46	0.82
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Acer</i>	<i>rubrum</i> var. <i>trilobum</i>	0.5	2.22	0.125	0.24	2.46	0.82
<i>Acer</i>	species	0.5	2.22	0.125	0.24	2.46	0.82
Totals			100	52.375	100	200	66.67

**Table 7A. Summary of the Herbaceous Stratum in *Cyrilla racemiflora* - *Ilex coriacea* - (*Cliftonia monophylla*)
Saturated Shrubland Alliance in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Ilvo</i>	<i>vomitorea</i>	1	3.03	7.25	20.28	23.31	7.77
<i>Smilax</i>	<i>pumilia</i>	1	3.03	5.75	16.08	19.11	6.37
<i>Ilvo</i>	<i>opaca</i>	1	3.03	3	8.39	11.42	3.81
<i>Persia</i>	<i>palustris</i>	1	3.03	2.75	7.69	10.72	3.57
<i>Cornus</i>	<i>florida</i>	1	3.03	1.5	4.2	7.23	2.41
<i>Asimina</i>	<i>parviflora</i>	1	3.03	1.25	3.5	6.53	2.18
<i>Mitchella</i>	<i>repens</i>	1	3.03	1.25	3.5	6.53	2.18
<i>Quercus</i>	<i>falcata</i>	1	3.03	1.25	3.5	6.53	2.18
<i>Smilax</i>	<i>glauc</i>	1	3.03	1.25	3.5	6.53	2.18
<i>Juniperus</i>	<i>virginiana</i>	1	3.03	1	2.8	5.83	1.94
<i>Rhamus</i>	<i>caroliniana</i>	1	3.03	1	2.8	5.83	1.94
<i>Sassafras</i>	<i>albidum</i>	1	3.03	1	2.8	5.83	1.94
<i>Callicarpa</i>	<i>americanum</i>	1	3.03	0.75	2.1	5.13	1.71
<i>Quercus</i>	<i>albus</i>	1	3.03	0.75	2.1	5.13	1.71
<i>Carex</i>	<i>species</i>	1	3.03	0.5	1.4	4.43	1.48
<i>Chasmanthium</i>	<i>laxum</i>	1	3.03	0.5	1.4	4.43	1.48
<i>Parthenocissus</i>	<i>quinquefolia</i>	1	3.03	0.5	1.4	4.43	1.48
<i>Prunus</i>	<i>serotina</i>	1	3.03	0.5	1.4	4.43	1.48
<i>Smilax</i>	<i>walterii</i>	1	3.03	0.5	1.4	4.43	1.48
<i>Acer</i>	<i>rubrum</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Berchemia</i>	<i>scandens</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Galium</i>	<i>species</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Ilvo</i>	<i>species</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Morus</i>	<i>rubra</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Myrica</i>	<i>cerifera</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Panicum</i>	<i>communtatum</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Quercus</i>	<i>laurifolia</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Sabatia</i>	<i>species</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Spiranthes</i>	<i>species</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Smilax</i>	<i>smallii</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Toxicodendron</i>	<i>radicans</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Vaccinium</i>	<i>species</i>	1	3.03	0.25	0.7	3.73	1.24
<i>Vitis</i>	<i>aestivalis</i>	1	3.03	0.25	0.7	3.73	1.24
Totals			100	35.75	100	200	66.67

**Table 8A. Summary of the Herbaceous Stratum in the *Pinus taeda* - *Quercus (alba, falcata, stellata)*
Forest Alliance in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Ilex</i>	<i>vomitorea</i>	0.92	5.53	4.0217	21.5	27.02	9.01
<i>Persea</i>	<i>palustris</i>	0.67	4.02	3.1458	16.81	20.83	6.94
<i>Quercus</i>	<i>hemispherica</i>	0.42	2.51	1.5208	8.13	10.64	3.55
<i>Smilax</i>	<i>smallii</i>	0.83	5.03	0.5208	2.78	7.81	2.6
<i>Mitchella</i>	<i>repens</i>	0.58	3.52	0.6667	3.56	7.08	2.36
<i>Smilax</i>	<i>glauca</i>	0.83	5.03	0.3542	1.89	6.92	2.31
<i>Callicarpa</i>	<i>americana</i>	0.42	2.51	0.5208	2.78	5.3	1.77
<i>Smilax</i>	<i>pumila</i>	0.42	2.51	0.4167	2.23	4.74	1.58
<i>Toxicodendron</i>	<i>radicans</i>	0.33	2.01	0.4792	2.56	4.57	1.52
<i>Berchemia</i>	<i>scandens</i>	0.42	2.51	0.25	1.34	3.85	1.28
<i>Vaccinium</i>	<i>arboreum</i>	0.33	2.01	0.3333	1.78	3.79	1.26
<i>Asimina</i>	<i>parviflora</i>	0.42	2.51	0.2292	1.22	3.74	1.25
<i>Myrica</i>	<i>heterophylla</i>	0.08	0.5	0.5833	3.12	3.62	1.21
<i>Parthenocissus</i>	<i>quinquefolia</i>	0.25	1.51	0.3542	1.89	3.4	1.13
<i>Vitis</i>	<i>rotundifolia</i>	0.42	2.51	0.125	0.67	3.18	1.06
<i>Cornus</i>	<i>florida</i>	0.25	1.51	0.2917	1.56	3.07	1.02
<i>Smilax</i>	<i>rotundifolia</i>	0.25	1.51	0.25	1.34	2.84	0.95
<i>Gelsemium</i>	<i>sempervirens</i>	0.33	2.01	0.125	0.67	2.68	0.89
<i>Nyssa</i>	<i>sylvatica</i>	0.25	1.51	0.2083	1.11	2.62	0.87
<i>Panicum</i>	<i>species</i>	0.25	1.51	0.2083	1.11	2.62	0.87
<i>Acer</i>	<i>rubrum</i>	0.33	2.01	0.1042	0.56	2.57	0.86
<i>Chasmanthium</i>	<i>latifolium</i>	0.25	1.51	0.1875	1	2.51	0.84
<i>Quercus</i>	<i>falcata</i>	0.33	2.01	0.0833	0.45	2.46	0.82
<i>Liquidmbar</i>	<i>straciflua</i>	0.25	1.51	0.1667	0.89	2.4	0.8
<i>Quercus</i>	<i>alba</i>	0.25	1.51	0.1042	0.56	2.06	0.69
<i>Sassafras</i>	<i>albidum</i>	0.25	1.51	0.0833	0.45	1.95	0.65
<i>Panicum</i>	<i>commutatum</i>	0.17	1.01	0.1667	0.89	1.9	0.63
<i>Chasmanthium</i>	<i>laxum</i>	0.08	0.5	0.25	1.34	1.84	0.61
<i>Sebastiana</i>	<i>fruticosa</i>	0.17	1.01	0.125	0.67	1.67	0.56
<i>Ilex</i>	<i>opaca</i>	0.17	1.01	0.1042	0.56	1.56	0.52
<i>Linum</i>	<i>striatum</i>	0.17	1.01	0.1042	0.56	1.56	0.52
<i>Carex</i>	<i>abscondita</i>	0.17	1.01	0.0833	0.45	1.45	0.48
<i>Quercus</i>	<i>laurifolia</i>	0.08	0.5	0.1667	0.89	1.39	0.46
<i>Pinus</i>	<i>taeda</i>	0.17	1.01	0.0625	0.33	1.34	0.45

**Table 8A. Summary of the Herbaceous Stratum in the *Pinus taeda* - *Quercus (alba, falcata, stellata)*
Forest Alliance in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Prunus</i>	<i>caroliniana</i>	0.17	1.01	0.0625	0.33	1.34	0.45
<i>Quercus</i>	<i>nigra</i>	0.17	1.01	0.0625	0.33	1.34	0.45
<i>Panicum</i>	<i>dichotomiflorum</i>	0.17	1.01	0.0417	0.22	1.23	0.41
<i>Quercus</i>	<i>species</i>	0.17	1.01	0.0417	0.22	1.23	0.41
<i>Acer</i>	<i>barbatum</i>	0.08	0.5	0.125	0.67	1.17	0.39
<i>Bignonia</i>	<i>capreolata</i>	0.08	0.5	0.125	0.67	1.17	0.39
<i>Saccharum</i>	<i>baldwinii</i>	0.08	0.5	0.125	0.67	1.17	0.39
<i>Scleria</i>	<i>oligantha</i>	0.08	0.5	0.125	0.67	1.17	0.39
<i>Scutellaria</i>	<i>integrifolia</i>	0.08	0.5	0.1042	0.56	1.06	0.35
<i>Ostrya</i>	<i>virginiana</i>	0.08	0.5	0.0833	0.45	0.95	0.32
<i>Pinus</i>	<i>echinata</i>	0.08	0.5	0.0833	0.45	0.95	0.32
<i>Scleria</i>	<i>species</i>	0.08	0.5	0.0833	0.45	0.95	0.32
<i>Galium</i>	<i>trifidum</i>	0.08	0.5	0.0625	0.33	0.84	0.28
<i>Ilex</i>	<i>decidua</i>	0.08	0.5	0.0625	0.33	0.84	0.28
<i>Ruellia</i>	<i>species</i>	0.08	0.5	0.0625	0.33	0.84	0.28
<i>Smilax</i>	<i>walteri</i>	0.08	0.5	0.0625	0.33	0.84	0.28
<i>Carex</i>	<i>nigromarginata</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Dichanthelium</i>	<i>lanuginosum</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Matelea</i>	<i>decipens</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Pteridium</i>	<i>aqualinum</i> var. <i>pseudocaudatum</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Quercus</i>	<i>macrocarpa</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Sebastiania</i>	<i>fruticosa</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Vaccinium</i>	<i>stamineum</i>	0.08	0.5	0.0417	0.22	0.73	0.24
<i>Allium</i>	<i>canadense</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Aristolochia</i>	<i>serpentaria</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Ascyrum</i>	<i>hypericoides</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Berchemia</i>	<i>species</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Botrychium</i>	<i>dissectum</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Carya</i>	<i>aquatica</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Carex</i>	<i>caroliniana</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Carex</i>	<i>corrugata</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Celtis</i>	<i>laevigata</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Chasmanthium</i>	<i>sessiliflorum</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Chionanthus</i>	<i>virginica</i>	0.08	0.5	0.0208	0.11	0.61	0.2

**Table 8A. Summary of the Herbaceous Stratum in the *Pinus taeda* - *Quercus (alba, falcata, stellata)*
Forest Alliance in the Pre-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Dominance (ground coverage %)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Cocculus</i>	<i>carolinus</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Dichanthelium</i>	<i>scoparium</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Eupatorium</i>	<i>compositifolium</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Hypericum</i>	<i>crus-andreae</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Morus</i>	<i>rubra</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Myrica</i>	<i>cerifera</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Oplismenus</i>	<i>hirtellus</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Prunus</i>	<i>species</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Ranunculus</i>	<i>carolinianus</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Rhamnus</i>	<i>caroliniana</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Rhynchospora</i>	<i>inexpansa</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Rhus</i>	<i>species</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Rubus</i>	<i>species</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Rubus</i>	<i>species</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Rubus</i>	<i>trivialis</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Sabatia</i>	<i>campestris</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Scleria</i>	<i>reticularis</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Smilax</i>	<i>hispida</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Smilax</i>	<i>laurifolia</i>	0.08	0.5	0.0208	0.11	0.61	0.2
Unknown	herb species	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Viburnum</i>	<i>acerifolium</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Viburnum</i>	<i>rufidulum</i>	0.08	0.5	0.0208	0.11	0.61	0.2
<i>Boehmeria</i>	<i>cylindrica</i>	0.08	0.5	0.0208	0.11	0.61	0.2
Totals			100	18.7092	100	200	66.67

**Table 9D. Summary of the the Woody Strata in the *Nyssa (aquatica, biflora, ogeche)* Floodplain
Seasonally Flooded Forest Alliance in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
Shrub Class									
<i>Sebastiania</i>	<i>fruticosa</i>	0.5	16.67	500	29.07	0.0098	10.99	56.73	18.91
<i>Ostrya</i>	<i>virginiana</i>	0.25	8.33	100	5.81	0.0314	35.16	49.31	16.44
<i>Berchemia</i>	<i>scandens</i>	0.25	8.33	200	11.63	0.0196	21.98	41.94	13.98
<i>Symplocos</i>	<i>tinctoria</i>	0.25	8.33	300	17.44	0.0059	6.59	32.37	10.79
<i>Vitis</i>	<i>rotundifolia</i>	0.25	8.33	100	5.81	0.0079	8.79	22.94	7.65
<i>Bignonia</i>	<i>capreolata</i>	0.25	8.33	100	5.81	0.002	2.2	16.35	5.45
<i>Carpinus</i>	<i>caroliniana</i>	0.25	8.33	100	5.81	0.002	2.2	16.35	5.45
<i>Magnolia</i>	<i>virginiana</i>	0.25	8.33	100	5.81	0.002	2.2	16.35	5.45
<i>Nyssa</i>	<i>biflora</i>	0.25	8.33	100	5.81	0.002	2.2	16.35	5.45
<i>Vaccinium</i>	<i>corymbosum</i>	0.25	8.33	100	5.81	0.002	2.2	16.35	5.45
<i>Quercus</i>	<i>laurifolia</i>	0.25	8.33	20	1.16	0.0049	5.49	14.99	5
Totals			100	1720	100	0.0893	100	300	100
Midstory Class									
<i>Carpinus</i>	<i>caroliniana</i>	0.75	10	190	14.07	1.0998	29.1	53.17	17.72
<i>Cyrilla</i>	<i>racemiflora</i>	0.25	3.33	300	22.22	0.5633	14.91	40.46	13.49
<i>Quercus</i>	<i>laurifolia</i>	0.25	3.33	180	13.33	0.6193	16.39	33.05	11.02
<i>Ilex</i>	<i>vomitorea</i>	0.75	10	130	9.63	0.3825	10.12	29.75	9.92
<i>Vitis</i>	<i>rotundifolia</i>	0.75	10	80	5.93	0.097	2.57	18.49	6.16
<i>Ilex</i>	<i>opaca</i>	0.75	10	70	5.19	0.064	1.69	16.88	5.63
<i>Acer</i>	<i>rubrum</i>	0.5	6.67	60	4.44	0.1074	2.84	13.95	4.65
<i>Bignonia</i>	<i>capreolata</i>	0.25	3.33	60	4.44	0.1512	4	11.78	3.93
<i>Magnolia</i>	<i>virginiana</i>	0.25	3.33	60	4.44	0.1512	4	11.78	3.93
<i>Quercus</i>	<i>nigra</i>	0.25	3.33	30	2.22	0.1492	3.95	9.5	3.17
<i>Fraxinus</i>	<i>pensylvanica</i>	0.25	3.33	40	2.96	0.1084	2.87	9.16	3.05
<i>Ostrya</i>	<i>virginiana</i>	0.25	3.33	40	2.96	0.0452	1.19	7.49	2.5
<i>Berchemia</i>	<i>scandens</i>	0.25	3.33	30	2.22	0.0475	1.26	6.81	2.27
<i>Carya</i>	<i>cordiformis</i>	0.25	3.33	10	0.74	0.0785	2.08	6.15	2.05
<i>Persea</i>	<i>palustris</i>	0.25	3.33	10	0.74	0.0332	0.88	4.95	1.65
<i>Symplocos</i>	<i>tinctoria</i>	0.25	3.33	10	0.74	0.0238	0.63	4.7	1.57
<i>Liquidambar</i>	<i>styraciflua</i>	0.25	3.33	10	0.74	0.019	0.5	4.58	1.53
<i>Quercus</i>	<i>michauxii</i>	0.25	3.33	10	0.74	0.0126	0.33	4.41	1.47
<i>Carpinus</i>	<i>aquatica</i>	0.25	3.33	10	0.74	0.0096	0.25	4.33	1.44

**Table 9D. Summary of the the Woody Strata in the *Nyssa (aquatica, biflora, ogeche)* Floodplain
Seasonally Flooded Forest Alliance in the Post-Operational Survey
Big Sandy Creek Unit, Big Thicket National Preserve**

Genus	Species	Frequency	Relative Frequency [%]	Density (# individuals/ha)	Relative Density [%]	Dominance (sq m/ha)	Relative Dominance [%]	Importance Value	Relative Importance Value [%]
<i>Toxicodendron</i>	<i>radicans</i>	0.25	3.33	10	0.74	0.0096	0.25	4.33	1.44
<i>Parthenocissus</i>	<i>quinquefolia</i>	0.25	3.33	10	0.74	0.0071	0.19	4.26	1.42
Totals			100	1350	100	3.7793	100	300	100
Overstory Class									
<i>Liquidambar</i>	<i>styraciflua</i>	0.5	10	50	12.82	5.7381	19.16	41.98	13.99
<i>Nyssa</i>	<i>biflora</i>	0.5	10	40	10.26	4.2302	14.13	34.38	11.46
<i>Quercus</i>	<i>lyrata</i>	0.25	5	20	5.13	6.412	21.41	31.54	10.51
<i>Fraxinus</i>	<i>pensylvanica</i>	0.5	10	50	12.82	1.8274	6.1	28.92	9.64
<i>Carpinus</i>	<i>caroliniana</i>	0.5	10	40	10.26	1.0304	3.44	23.7	7.9
<i>Fagus</i>	<i>grandifolia</i>	0.25	5	30	7.69	2.7585	9.21	21.91	7.3
<i>Quercus</i>	<i>lyrata</i>	0.25	5	20	5.13	3.441	11.49	21.62	7.21
<i>Bignonia</i>	<i>capreolata</i>	0.25	5	30	7.69	1.3293	4.44	17.13	5.71
<i>Magnolia</i>	<i>virginiana</i>	0.25	5	30	7.69	1.3293	4.44	17.13	5.71
<i>Ilex</i>	<i>opaca</i>	0.5	10	20	5.13	0.4885	1.63	16.76	5.59
<i>Quercus</i>	<i>laurifolia</i>	0.25	5	20	5.13	0.4339	1.45	11.58	3.86
<i>Ulmus</i>	<i>americana</i>	0.25	5	10	2.56	0.3464	1.16	8.72	2.91
<i>Cyrilla</i>	<i>racemiflora</i>	0.25	5	10	2.56	0.2688	0.9	8.46	2.82
<i>Persea</i>	<i>palustris</i>	0.25	5	10	2.56	0.1651	0.55	8.12	2.71
<i>Acer</i>	<i>rubrum</i> var. <i>drummondii</i>	0.25	5	10	2.56	0.1431	0.48	8.04	2.68
Totals			100	390	100	29.9421	100	300	100

Appendix D

Photo Gallery for the Big Sandy Creek Unit Post-Operational Vegetation and Impact Assessment

Appendix D: Photo Gallery for the Big Sandy Creek Unit Post-Operational Vegetation and Impact Assessment



Photo 1. *Nyssa aquatica* – *Taxodium distichum* Semipermanently Flooded Forest Alliance



Photo 3. *Quercus alba* – (*Quercus nigra*) Seasonally Flooded Forest Alliance



Photo 2. *Fraxinus pennsylvanica* – *Ulmus Americana* – *Celtis (occidentalis, laevigata)* Temporarily Flooded Forest Alliance



Photo 4. *Quercus (laurifolia, phellos)* Forest Alliance

Appendix D: Photo Gallery for the Big Sandy Creek Unit Post-Operational Vegetation and Impact Assessment



Photo 5. *Magnolia virginiana* – *Nyssa biflora* – (*Quercus laurifolia*) Saturated Forest Alliance



Photo 6. *Cyrilla racemiflora* – *Ilex coriacea* – (*Cliftonia monophylla*) Saturated Shrubland Alliance



Photo 7. *Pinus taeda* – *Quercus* (*alba*, *falcata*, *stellata*) Forest Alliance



Photo 8. *Nyssa* (*aquatica*, *biflora*, *ogeche*) Floodplain Seasonally Flooded Forest Alliance

Appendix D: Photo Gallery for the Big Sandy Creek Unit Post-Operational Vegetation and Impact Assessment



Photo 9. *Paspalum notatum* Herbaceous Alliance



Photo 11. Looking east on a source rack in the Alliance



Photo 10. Looking south on a receiver line in the ... Alliance



Photo 12. Receiver line used as a game trail near Big Sandy Creek

Appendix D: Photo Gallery for the Big Sandy Creek Unit Post-Operational Vegetation and Impact Assessment



Photo 13. Burned plot in the *Pinus taeda* – *Quercus* (*alba*, *falcata*, *stellata*) Forest Alliance



Photo 14. Burned plot in the *Pinus taeda* – *Quercus* (*alba*, *falcata*, *stellata*) Forest Alliance



Photo 15. Canebrake rattlesnake (*Crotalus horridus*) observed near the intersection of Monroe-Lilley and Sunflower roads.