



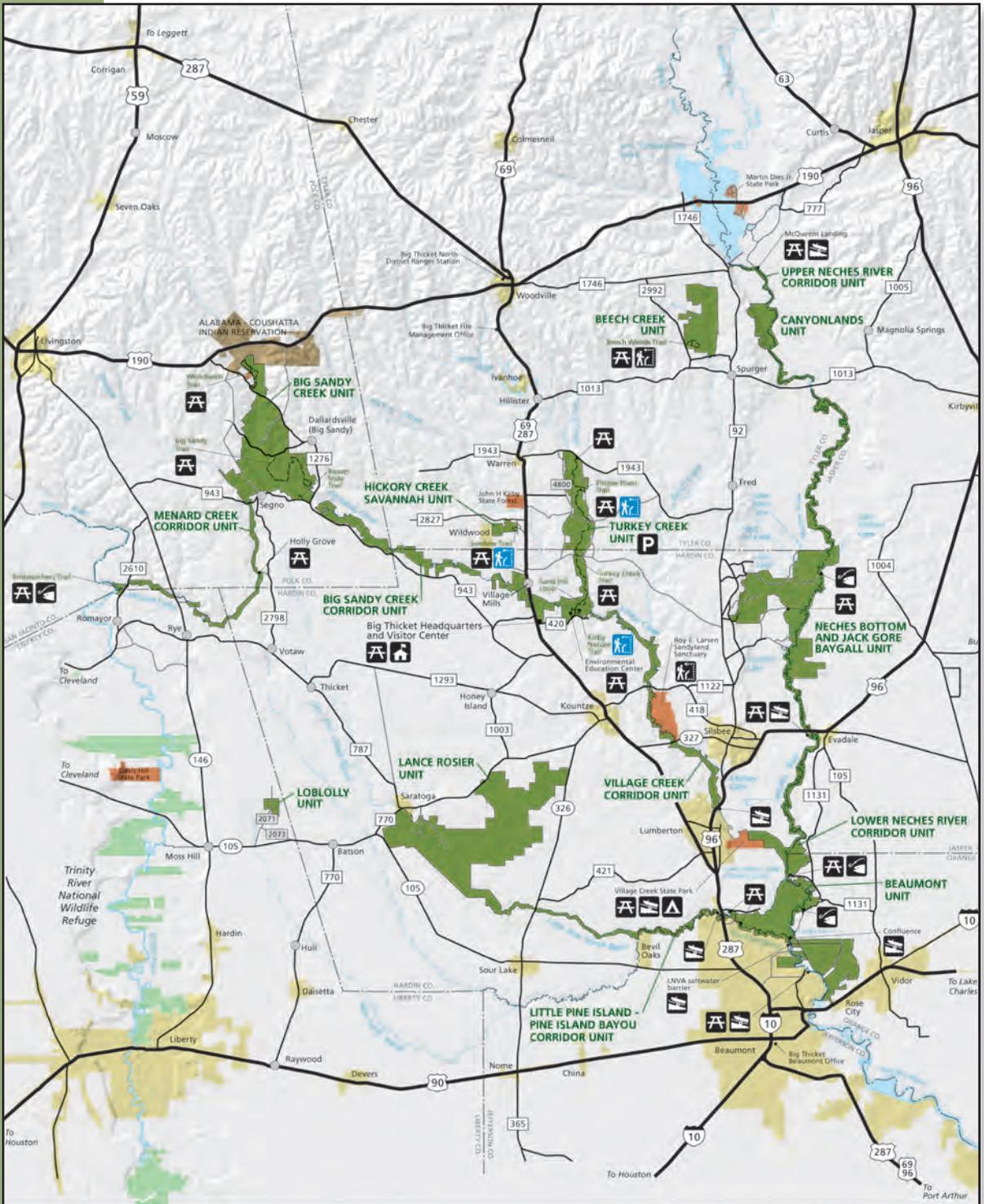
Foundation Document

Big Thicket National Preserve

Texas

May 2014





Camping	Self-guiding trail	Parking
Public boat launch	Wheelchair-accessible self-guiding trail	Trail
River access (no boat launching)	State road	Big Thicket National Preserve
Ranger station	Farm-market road	Other conservation areas (non NPS)
Picnic area and parking	County road	Trinity River National Wildlife Refuge
	Unpaved road	

Big Thicket National Preserve

North

0 5 Kilometers
0 5 Miles

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Mission of the National Park Service

The National Park Service (NPS) preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The National Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The NPS core values are a framework in which the National Park Service accomplishes its mission. They express the manner in which, both individually and collectively, the National Park Service pursues its mission. The NPS core values are:

- **Shared stewardship:** We share a commitment to resource stewardship with the global preservation community.
- **Excellence:** We strive continually to learn and improve so that we may achieve the highest ideals of public service.
- **Integrity:** We deal honestly and fairly with the public and one another.
- **Tradition:** We are proud of it; we learn from it; we are not bound by it.
- **Respect:** We embrace each other's differences so that we may enrich the well-being of everyone.

The National Park Service is a bureau within the Department of the Interior. While numerous national park system units were created prior to 1916, it was not until August 25, 1916, that President Woodrow Wilson signed the National Park Service Organic Act formally establishing the National Park Service.

The national park system continues to grow and comprises 401 park units covering more than 84 million acres in every state, the District of Columbia, American Samoa, Guam, Puerto Rico, and the Virgin Islands. These units include, but are not limited to, national parks, monuments, battlefields, military parks, historical parks, historic sites, lakeshores, seashores, recreation areas, scenic rivers and trails, and the White House. The variety and diversity of park units throughout the nation require a strong commitment to resource stewardship and management to ensure both the protection and enjoyment of these resources for future generations.



The arrowhead was authorized as the official National Park Service emblem by the Secretary of the Interior on July 20, 1951. The sequoia tree and bison represent vegetation and wildlife, the mountains and water represent scenic and recreational values, and the arrowhead represents historical and archeological values.

Introduction

Every unit of the national park system will have a foundational document to provide basic guidance for planning and management decisions—a foundation for planning and management. The core components of a foundation document include a brief description of the park as well as the park’s purpose, significance, fundamental resources and values (FRVs), other important resources and values (OIRVs), and interpretive themes. The foundation document also includes special mandates and administrative commitments, an assessment of planning and data needs that identifies planning issues, planning products to be developed, and the associated studies and data required for park planning. Along with the core components, the assessment provides a focus for park planning activities and establishes a baseline from which planning documents are developed.

A primary benefit of developing a foundation document is the opportunity to integrate and coordinate all kinds and levels of planning from a single, shared understanding of what is most important about the park. The process of developing a foundation document begins with gathering and integrating information about the park. Next, this information is refined and focused to determine what the most important attributes of the park are. The process of preparing a foundation document aids park managers, staff, and the public in identifying and clearly stating in one document the essential information that is necessary for park management to consider when determining future planning efforts, outlining key planning issues, and protecting resources and values that are integral to park purpose and identity.

While not included in this document, a park atlas is also part of a foundation project. The atlas is a series of maps compiled from available geographic information system (GIS) data on natural and cultural resources, visitor use patterns, facilities, and other topics. It serves as a GIS-based support tool for planning and park operations. The atlas is published as a (hard copy) paper product and as geospatial data for use in a web mapping environment. The park atlas for Big Thicket National Preserve can be accessed online at: <http://insideparkatlas.nps.gov/>.



Part 1: Core Components

The core components of a foundation document include a brief description of the park, park purpose, significance statements, fundamental resources and values, other important resources and values, and interpretive themes. These components are core because they typically do not change over time. Core components are expected to be used in future planning and management efforts.

Brief Description of the Preserve

Big Thicket National Preserve is in southeast Texas just north of Beaumont and 75 miles northeast of Houston. The preserve consists of nine land units and six water corridors encompassing more than 108,208 acres scattered across a 3,500-square-mile area. The Big Thicket, often referred to as a “biological crossroads,” is a transition zone between four distinct vegetation types—the moist eastern hardwood forest, the southwestern desert, the southeastern swamp, and the central prairie. Species from all of these different vegetation types come together in the thicket, exhibiting a variety of vegetation and wildlife that has received national interest.

The ecological area represented by the preserve once covered more than 3 million acres of southeast Texas and contained large quantities of natural resources such as gas, oil, and timber. Since the late 1800s, widespread logging and oil production have reduced the original area to approximately 300,000 acres, little of which remains in a pristine state. In 1974 concern that the unique ecological values of the thicket would eventually be completely lost led to the designation of representative segments of the thicket as the first national preserve in the national park system.

Historically, the area was wilderness with limited occupation by American Indian tribes until the early 1800s and 1890s when cattle ranching, timber industry, and railroads moved into the region. An oil well was drilled at Saratoga in 1866. This pioneer effort preceded the east Texas oil boom, which developed between 1901 and 1903, when Spindle Top (Beaumont) and Hooks 7 (Saratoga) came into production. In the three decades after 1900, a wave of new settlers poured into the new oil boom towns in Hardin, Polk, and Tyler counties. Many sawmill communities also experienced renewed prosperity.

Today, forest products and petrochemical industries remain major contributors to the region’s economy. Forest lands are dwindling due to land conversion from forested to pasturelands or development. Housing developments are pressing on the margins of the thicket and creating countless openings through its interior. However, the Big Thicket is also an area where visitors may choose to experience outdoor solitude as well as a variety of recreational opportunities.

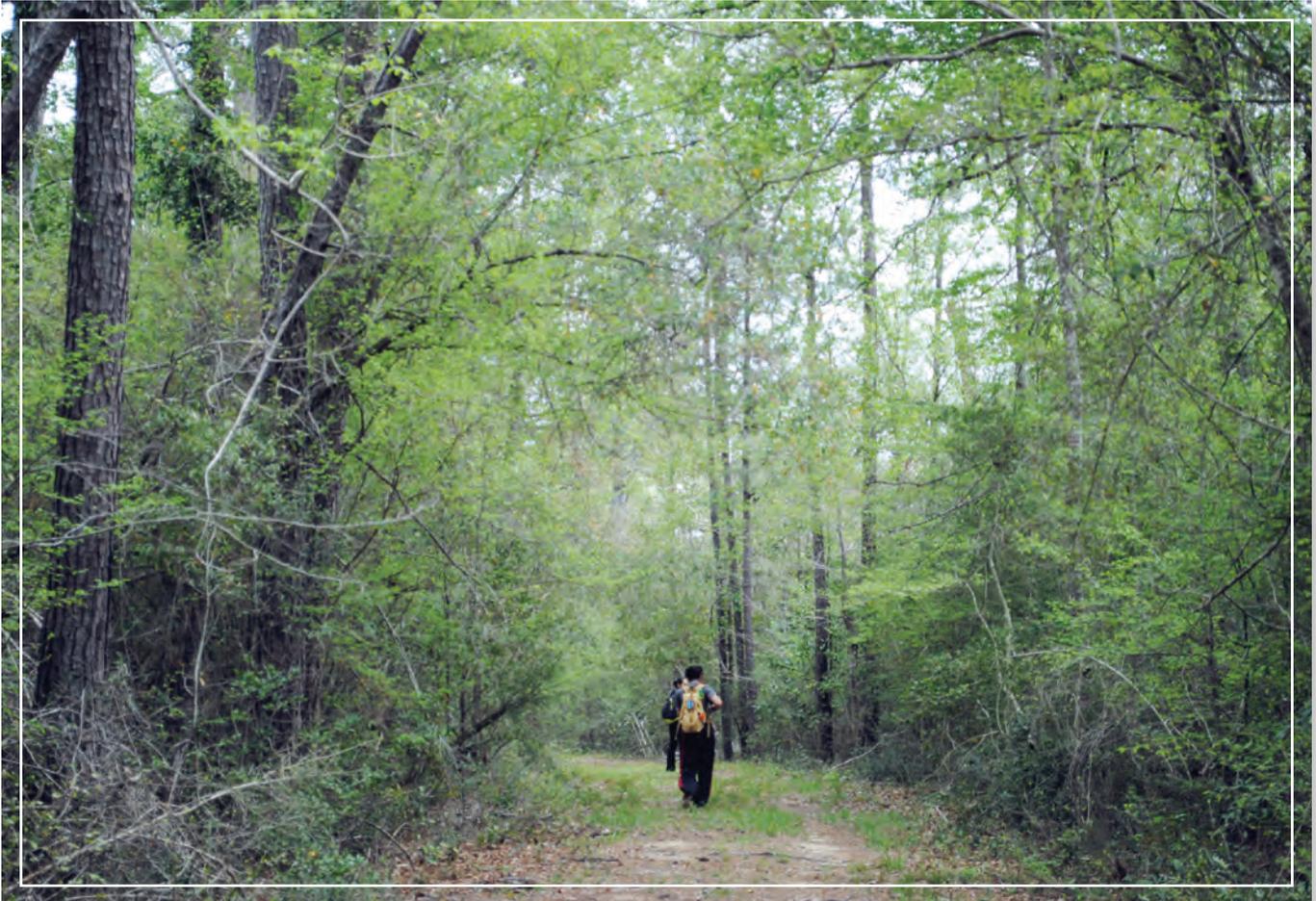


Park Purpose

The purpose statement identifies the specific reason(s) for establishment of a particular park unit. The purpose statement for Big Thicket National Preserve was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The preserve was established when the enabling legislation adopted by Congress was signed into law on October 11, 1974 (see appendix A for enabling legislation and subsequent amendments). The purpose statement lays the foundation for understanding what is most important about the park unit.

The purpose of Big Thicket National Preserve is:

BIG THICKET NATIONAL PRESERVE represents a portion of “the Big Thicket” in southeast Texas, which is known for its extensive biological diversity. The Big Thicket National Preserve is dedicated to preserving, conserving, protecting, and enhancing the integrity of the natural and ecological systems in the Big Thicket. The preserve offers both scientific and recreational values and provides for public enjoyment.



Park Significance

Significance statements express why a park's resources and values are important enough to merit designation as a unit of the national park system. These statements are linked to the purpose of Big Thicket National Preserve, and are supported by data, research, and consensus. Statements of significance describe the distinctive nature of the park and why an area is important within a global, national, regional, and systemwide context. They focus on the most important resources and values that will assist in park planning and management.

The following significance statements have been identified for Big Thicket National Preserve. (Please note that the sequence of the statements do not reflect the level of significance.)

- 1. Extraordinary Combination of Habitats and Species and Their Scientific Value.** Big Thicket National Preserve, the first national preserve, was in essence set aside for its biodiversity. The preserve contains remnants of the Big Thicket of Texas and its diverse units are representative of the larger biogeographic region. The preserve serves as a refuge for a combination of plants, animals, and natural communities that include elements from the four distinct vegetation types: the distinct southwestern desert, central plain, eastern forest, and southeastern swamp. The preserve is the only park unit with this combination of resources. The opportunities for scientific research at the preserve include the study of biodiversity and disturbance resulting from land uses and natural phenomena (e.g., hurricanes and fires).
- 2. Flowing Water and Dependent Systems.** Big Thicket National Preserve has an extensive, dynamic system of hydrologic processes and associated dependent systems important to maintain the diverse yet specific ecological make-up of the Big Thicket. These include contiguous riverine and wetland systems. The preserve provides examples of blackwater systems, which are not typically found outside of the Amazon Basin and southeastern United States, and of rare baygall wetlands that exemplify the original and seemingly impenetrable Big Thicket.
- 3. National and International Designations.** Big Thicket National Preserve has received both national and international recognition. The preserve was designated an international biosphere reserve in 1981 by the United Nations Educational, Scientific, and Cultural Organization to promote cooperation with neighboring communities, individuals, agencies, and institutions to “ensure the preservation of the biological diversity, provide for research, and promote the use of the Big Thicket National Preserve for environmental education, training, and solutions to common problems.” The preserve was also designated a Globally Important Bird Area in 2001 by the American Bird Conservancy because it provides critical cover and forage to migrant neotropical birds using the Central and Mississippi flyways.
- 4. Visitor Experience.** In a state where public lands are not widely available, Big Thicket National Preserve offers the visitor a wide array of recreational and educational opportunities in a natural setting within close proximity to large urban areas.
- 5. Cultural Resources.** Big Thicket National Preserve has a rich cultural history spanning centuries and cultures—prehistoric to modern American Indians, Spanish explorers, and early settlers to today's modern users. Resources include remnants of historic land use activities and structures, traces of travel corridors, and archeological sites.



Fundamental Resources and Values

Fundamental resources and values (FRVs) are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. Fundamental resources and values are closely related to a park's legislative purpose and are more specific than significance statements.

Fundamental resources and values help focus planning and management efforts on what is truly significant about the park. One of the most important responsibilities of NPS managers is to ensure the conservation and public enjoyment of those qualities that are essential (fundamental) to achieving the purpose of the park and maintaining its significance. If fundamental resources and values are allowed to deteriorate, the park purpose and/or significance could be jeopardized.

The following fundamental resources and values have been identified for Big Thicket National Preserve:

Visitor Experience in a Natural Setting

- Big Thicket National Preserve provides access to the natural world in a region with very little public land, a growing population, and a sprawling development pattern. The public has an opportunity to make meaningful connections with the resources at the preserve through an array of traditional, educational, and recreational experiences that are compatible with the preservation of the natural setting and resources in the preserve.

Free-flowing Water and Dependent Systems

- Water is one of the pervasive resources in the preserve. Most of the preserve units either contain or are directly adjacent to high-order, perennial streams. Six of the existing 15 management units are river or stream corridor units. In addition to these major river and stream reaches, the preserve contains a wide variety of minor hydrologic features: floodplains, sloughs, oxbows, baygalls, acid bogs, and low-order tributary streams. The majority of the streams within the preserve are perennial, free-flowing, and nonchannelized watercourses. The preserve provides examples of blackwater systems and rare baygall wetlands.
- Fluvial features and processes (channel migration, erosion, and flooding) dominate the landscape at Big Thicket and substantially influence vegetation community structure and composition.
- The management units of the preserve lie within four watersheds, the lower reaches of the main stem of the Neches River, Big Sandy or Village Creek, and Pine Island Bayou. With the exception of the Menard Creek unit, following water from almost anywhere in the preserve will lead to the Neches River, from which organic material from the preserve is carried by the river into the marshes below Beaumont, nourishing shrimp larvae and mussels.
- At least 40% of the preserve is composed of wetlands.
- Riparian areas exist throughout the preserve and are ecologically important because they reduce floods, improve water quality, provide a vital groundwater recharge area, provide shade, and provide key resources that support biological diversity.
- Floodplains account for roughly 50% of the preserve and are where most of the preserve's wetlands are located. The water corridor units and riparian corridors are in floodplains and consist primarily of floodplain forests.

Biodiversity

- Big Thicket National Preserve was in essence set aside for its biodiversity. The incorporation of diverse plant communities and habitats, including representative terrestrial units connected by linear aquatic corridors, was a central principle of the preserve's establishment, designed in the hopes of protecting the ecosystems, communities, and processes needed to support the native biological diversity of the region amidst a rapidly developing landscape.

Compositional Diversity

- **Biome Level:** The Big Thicket region lies near the intersection of several major biomes that influence the plant and animal communities. Eastern hardwood forest, Gulf coastal plains, Midwest prairies, and southwest deserts contribute to assemblages and combinations of landforms, species, and climate that are uncommon elsewhere.
- **Community Level:** The preserve includes examples of rare and vulnerable natural communities such as arid sand hills, longleaf pine forests, beech-magnolia forests, wetland baygall shrub thickets, bald cypress-tupelo swamps, and other communities.
- **Species Level:** The preserve is species-rich, including 290 birds, 54 amphibians and reptiles, and 52 mammals that have been identified from incomplete surveys. Diggs et al. (2006)¹ estimated that there are 1,826 species of vascular plants in 174 families in the Big Thicket region—and that this is an underestimate. The “Thicket of Diversity” All Taxa Biological Inventory has begun to catalog species diversity in several taxonomic groups including terrestrial and aquatic invertebrates, fungi, and slime molds. Rare species include federal-endangered Texas trailing phlox, five reptile species, and several bird species.
- **Genetic Level:** Species that occur at the limits of their range may possess genetic variation that is beneficial for survival and growth in the ecological conditions that occur at these margins. In the Big Thicket region, many eastern species of plants occur at the western and southern limits of their range, including American beech and swamp titi. Smaller numbers of western species find their eastern limit here, too. Research on genetic variation (the basis of adaptation) and gene flow at environmental margins may provide insight into the ability of species to adapt to climate change or track suitable habitat as it changes in response to climate.

Structural Diversity

- Spatial and temporal patterns (i.e., how biodiversity is distributed in space and time) are important elements of diversity. Diggs et al. (2006)² notes that the close proximity of “radically different habitats and communities” is one of the most striking features of the Big Thicket. Broad landscape-scale matrix communities embed smaller patches that have dominant species or other characters that contrast markedly with their surroundings. Disturbances such as hurricanes and fire, or local influences of soil, topography, and hydrology help to create and maintain this diversity. Soil texture gradients are a particularly important factor influencing the vegetation mosaic of the Big Thicket. For example, flat terrain and tight clay soils contribute to the formation of wetland pine savannas, which retard the growth of woody plants and foster carnivorous plant species that are absent from surrounding upland plant communities. Wetland pine savannas contain some of the richest plant diversity in the preserve.

1. G. M. Diggs, B. L. Lipscomb, M. D. Reed, and R. J. O’Kennon (2006). *Illustrated Flora of East Texas*. Sida, Bot. Misc. 26: 1–1594.
 2. G. M. Diggs, B. L. Lipscomb, M. D. Reed, and R. J. O’Kennon (2006). *Illustrated Flora of East Texas*. Sida, Bot. Misc. 26: 1–1594.



Processes and Functional Diversity

- Fire, floods, and tropical storms are three major ecological drivers of Big Thicket that reveal their evidence in numerous ways, particularly in vegetative structure and composition and fluvial landforms. High productivity and growth and decay are also important functions that result from the long growing season, abundant and evenly distributed rainfall, and frost-free climatic conditions that prevail over the entire Big Thicket landscape. Other important ecosystem-level functions in the Big Thicket include river meanders, erosion, sediment transport and deposition, anthropogenic forces (land use changes, deforestation, hydrologic response changes, environmental releases and spills to air, water, and soil, sound, and light pollution), infestation and disease (e.g., southern pine beetle), and invasive species.

Scientific Value

- The preserve provides the largest protected area in the Big Thicket region for the scientific study of biodiversity. Scientific research at the preserve, including the “Thicket of Diversity” All Taxa Biological Inventory, holds great promise for the discovery of new species and within-species genetic diversity; improving the understanding of the role of biological corridors for the maintenance of populations and genetic diversity; and understanding the response, resilience, and recovery of plant and animal communities to natural and anthropogenic disturbances.

The Thicket

- The Big Thicket has long been a forbidding landscape, with dense jungle-like forests, bayous and swamps, and innumerable streams deterring attempts to settle it. The thicket remained largely impenetrable and unknown until widespread logging by railroads began in the 1880s.
- The diversity of the thicket has made it a challenge to define. Various interpretations and maps of the thicket have been offered by scientists since the 1930s and continue to spark debate and study.
- A reasonably concise definition of the thicket is “the biological boundary area at the southwestern extreme of the southeastern U.S., humid subtropical in climate, geologically and hydrologically complex, rich in species, and characterized by a loblolly pine-white oak-beech-magnolia forest with many associated and often very distinct vegetation types.”
- The exact boundaries of the thicket may always be imprecise but the Big Thicket is a rich and unique part of Texas and North American ecology that warrants long-term protection and preservation.

Other Important Resources and Values

Big Thicket National Preserve contains other resources and values that are not fundamental to the purpose of the preserve and may be unrelated to its significance, but are important to consider in planning processes. These resources and values have been selected because they are important in the operation and management of the preserve and warrant special consideration in preserve planning.

The following other important resources and values have been identified for Big Thicket National Preserve:

Cultural Resources

- Several archeological sites have been identified within the preserve providing evidence of prehistoric and historic American Indians use and occupation, and evidence of European American activities primarily from the latter half of the 19th and first half of the 20th centuries (e.g., homesteads, logging camps and mills, roads or trails, steamboat landings, and oil and gas production sites).
- The Big Thicket retains important cultural and ethnographic values, resources, and connections for traditionally associated peoples including the Alabama-Coushatta Tribe of Texas (e.g., the Alabama Trace bisects the Big Sandy unit) and other groups such as the descendants of European American farmers and stock raisers who settled the area.
- Character-defining elements of the Big Thicket's diverse cultural landscape provide tangible evidence of the area's historical development: land use systems, circulation features and patterns (trails, wagon, and lumber roads; the Alabama Trace; ferry routes), and vegetation patterns such as those of former farm sites and pine plantations.



Interpretive Themes

Interpretive themes are often described as the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit. Themes are derived from, and should reflect, park purpose, significance, resources, and values. The set of interpretive themes is complete when it provides the structure necessary for park staff to develop opportunities for visitors to explore and relate to all park significance statements and fundamental and other important resources and values.

Interpretive themes are an organizational tool that reveal and clarify meaning, concepts, contexts, and values represented by park resources. Sound themes are accurate and reflect current scholarship and science. They encourage exploration of the context in which events or natural processes occurred and the effects of those events and processes. Interpretive themes go beyond a mere description of the event or process to foster multiple opportunities to experience and consider the park and its resources. These themes help explain why a park story is relevant to people who may otherwise be unaware of connections they have to an event, time, or place associated with the park.

The following interpretive themes have been identified for Big Thicket National Preserve:

- By preserving remnants of the unique Big Thicket of Texas, the preserve offers opportunities to better understand and appreciate the interdependence of ecological systems. The amazingly rich biological diversity of Big Thicket National Preserve includes rare and endangered species and habitats in an unusual assemblage of common animals and plants.
- Big Thicket National Preserve’s intimate landscape and its unique combination of distinct and diverse ecosystems prompts a slower-paced exploration of its many wonders and enables opportunities for peaceful reflection, recreation, and a personal sense of discovery.
- The relationships of people with Big Thicket National Preserve prompts us to consider how past, present, and future land-use decisions will continue to influence those relationships.



Part 2: Dynamic Components

The dynamic components of a foundation document include special mandates and administrative commitments and an assessment of planning and data needs. These components are dynamic because they will change over time. New special mandates can be established and new administrative commitments made. As conditions and trends of fundamental and other important resources and values change over time, the analysis of planning and data needs will need to be revisited and revised, along with key issues. Therefore, this part of the foundation document will be updated accordingly.

Special Mandates and Administrative Commitments

Many management decisions for a park unit are directed or influenced by special mandates and administrative commitments with other federal agencies, state and local governments, utility companies, partnering organizations, and other entities. Special mandates are requirements specific to a park that must be fulfilled. Mandates can be expressed in enabling legislation, in separate legislation following the establishment of the park, or through a judicial process. They may expand on park purpose or introduce elements unrelated to the purpose of the park. Administrative commitments are, in general, agreements that have been reached through formal, documented processes, often through memoranda of agreement. Examples include easements, rights-of-way, arrangements for emergency service responses, etc. Special mandates and administrative commitments can support, in many cases, a network of partnerships that help fulfill the objectives of the park and facilitate working relationships with other organizations. They are an essential component of managing and planning for Big Thicket National Preserve.

Special Mandates

The following special mandates have been summarized. Full text of the relevant legislation is in “Appendix A: Enabling Legislation and Legislative Acts for Big Thicket National Preserve.”

PUBLIC LAW 93-439 as amended (October 11, 1974)

Sec. 1 (c), authorizes the Secretary to acquire lands that make a significant contribution to the preserve, even if the lands are located outside the preserve boundary.

Sec. 2 (a), authorizes the Secretary to acquire lands located within boundaries, excluding mineral estates, or easements for public utilities, pipelines, or railroads, unless the NPS determines that if the parcel is not acquired, the purposes and objectives of the preserve are threatened.

Sec. 4 (b), limits construction of roads, campgrounds, and facilities. Authorizes the Secretary of the Interior to promulgate rules in respect to

1. motorized land and water vehicles;
2. exploration for, and extraction of, oil, gas, and other minerals;
3. new construction of any kind;
4. grazing and agriculture; and
5. such other uses as the Secretary of the Interior determines must be limited or controlled in order to carry out the purpose of this act.

Sec. 4 (c), allows hunting, fishing, and trapping within the preserve, excluding designation zones because of health and safety concerns and resource considerations. The NPS will consult with the appropriate State agency, as required.

Special Designations

United Nations Education, Scientific and Cultural Organization Man and the Biosphere

On December 14, 1981, the preserve was designated an International Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization Man and the Biosphere program. The Big Thicket, often referred to as a “biological crossroad,” is a transition zone where southeastern swamps, eastern deciduous forest, central plains, pine savannas, and dry sandhills meet and intermingle. This giant ecotone provides habitat for rare species and favors unusual combinations of plants and animals.

Globally Important Bird Area

On July 26, 2001, the American Bird Conservancy recognized the preserve as a Globally Important Bird Area joining thousands of others around the world. This designation underscores the significance of the Big Thicket and the importance of preserving habitat for avifauna in this region of Texas.

Texas State Paddling Trail

Village Creek is an official Texas State Paddling Trail and attracts canoeists and kayakers year-round. The Texas Paddling Trails is a program to develop public inland and coastal paddling trails throughout the state.

Staley Cabin

Built in 1936, the Staley cabin is a significant example of homesteading in the Big Thicket area of east Texas in the early 20th century. The Staley Cabin is a low-pitched, eave-oriented gable-roofed building that can be classified a 20th-century vernacular log structure. The National Park Service received concurrence from the Texas State Historical Commission on a Determination of Eligibility to the National Register of Historic Places for the Staley Cabin. This determination states that the Staley Cabin is potentially eligible for the national register under criterion A for its association with agriculture (homesteading) and criterion C as a significant example of a 20th-century log cabin in the Big Thicket area of Texas.

Big Thicket National Preserve Parkway

Most visitors to Southeast Texas are unaware that a unit of the National Park Service has been established in the region. Due to the dispersed nature of Big Thicket National Preserve, 15 units scatter over seven counties; it was proposed that a portion of U.S. Highway 69, which runs through the heart of the Big Thicket, be designated as a state parkway. The purpose for designating the highway that transects the preserve as the Big Thicket National Preserve Parkway is to “enhance eco-tourism opportunities for the area” (SRC-BWC H.B. 2334 77(R)). The Big Thicket National Preserve Parkway is designated as those sections of “U.S. Highway 69 between Interstate Highway 10 in Beaumont and Loop 287 in Lufkin” (Texas Transportation Code – Section 225.052). The designation occurred on June 15, 2001.

Administrative Commitments

For more information about the existing administrative commitments for Big Thicket National Preserve, please see appendix B.

Assessment of Planning and Data Needs

Once the core components of part 1 of the foundation document have been identified, it is important to gather and evaluate existing information about the park's fundamental and other important resources and values, and develop a full assessment of the park's planning and data needs. The assessment of planning and data needs section presents planning issues, the planning projects that will address these issues, and the associated information requirements for planning, such as resource inventories and data collection, including GIS data.

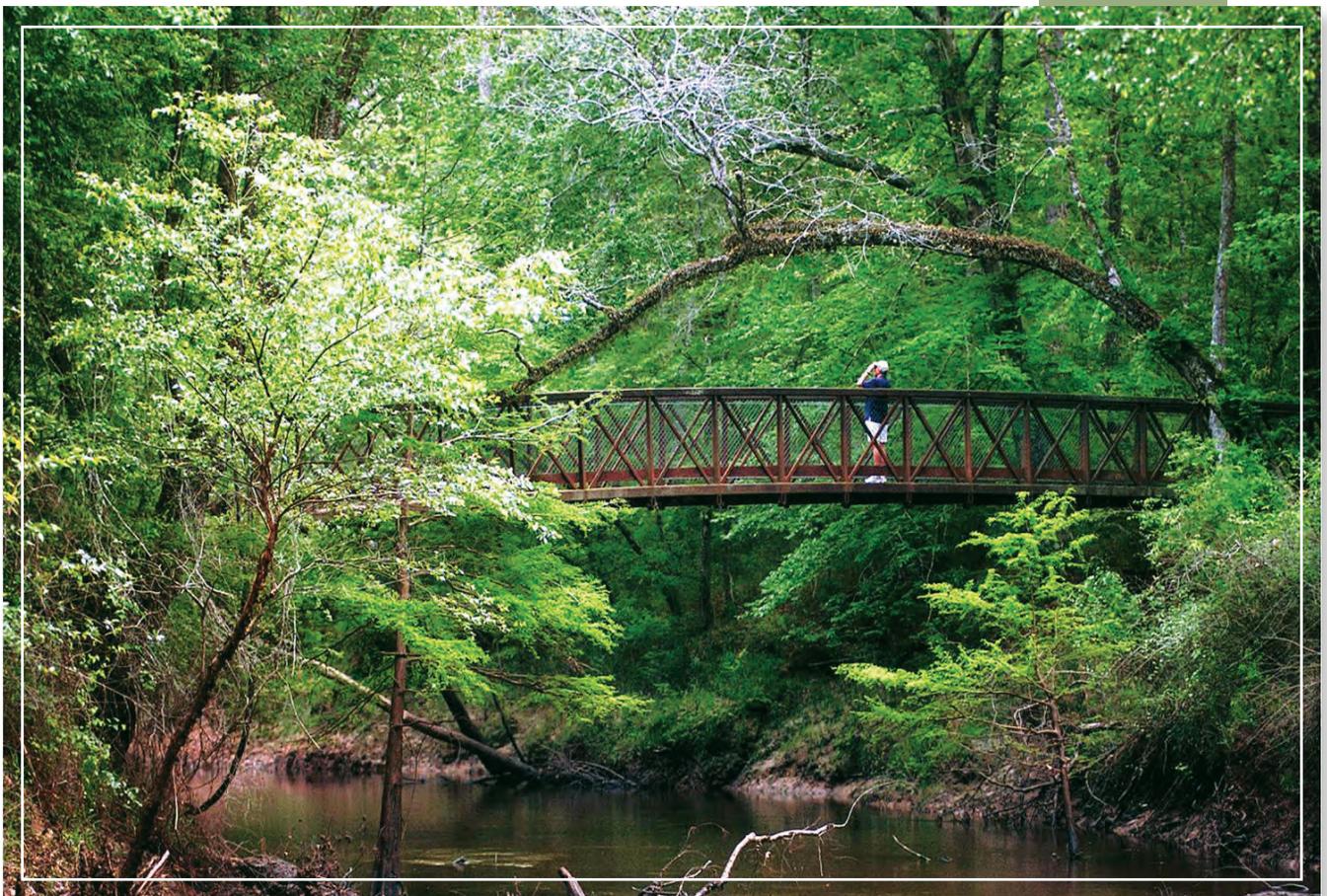
There are three sections in the assessment of planning and data needs:

1. analysis of fundamental and other important resources and values
2. identification of key issues and associated planning and data needs
3. identification of planning and data needs (including spatial mapping activities or GIS maps)

The analysis of fundamental and other important resources and values and identification of key issues leads up to and supports the identification of planning and data collection needs.

Analysis of Fundamental Resources and Values

The fundamental resource or value analysis table includes current conditions, potential threats and opportunities, planning and data needs, and selected laws and NPS policies related to management of the identified resource or value.

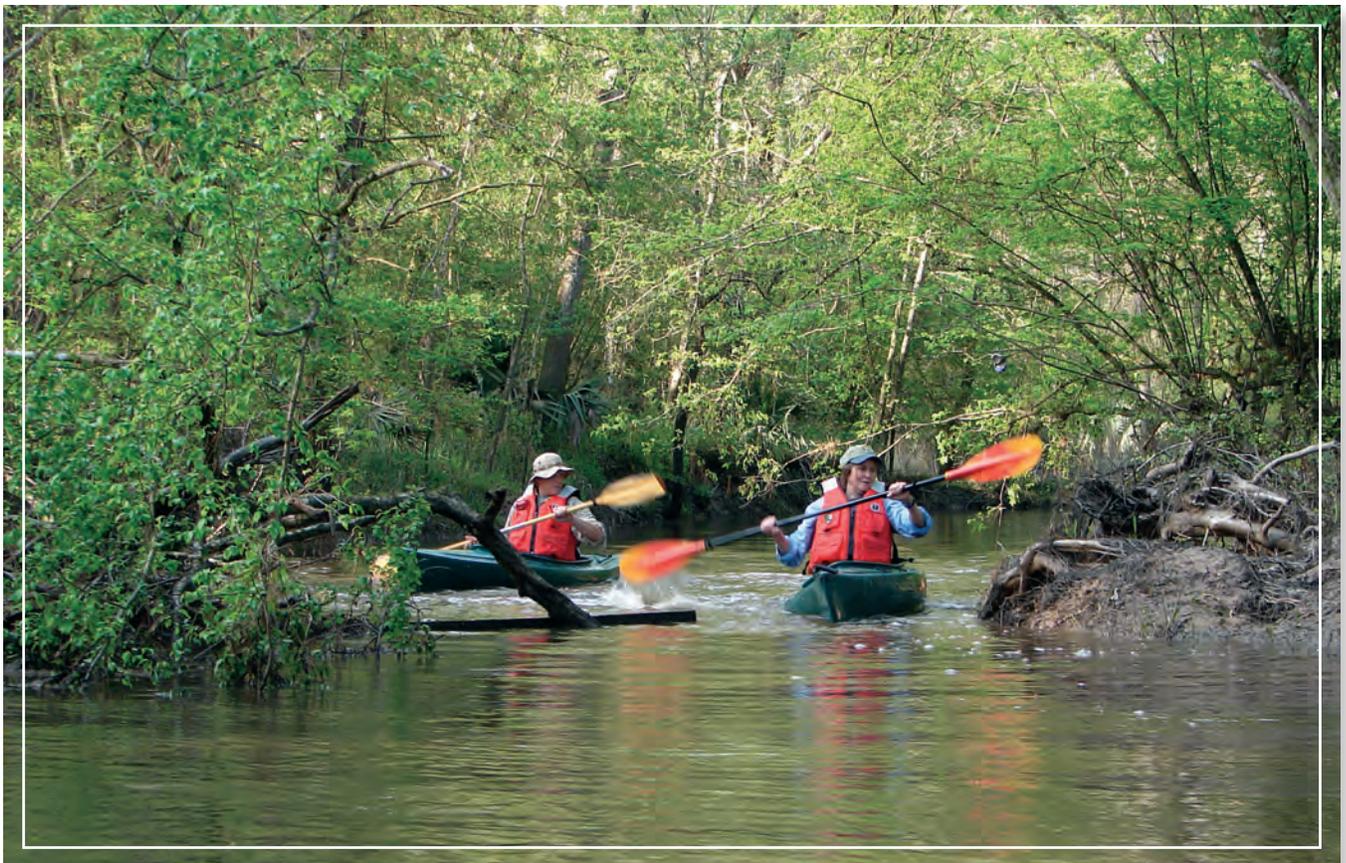


Fundamental Resource or Value	Visitor Experience in a Natural Setting
Related Significance Statements	<p>In a state where public lands are not widely available, Big Thicket National Preserve offers the visitor a wide array of recreational and educational opportunities in a natural setting within close proximity to large urban areas.</p>
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Big Thicket National Preserve offers a variety of recreational outdoor opportunities within a seven-county area in Southeast Texas, which has a population of 558,563. Less than 89 miles immediately west of the preserve sits the Houston metropolitan area, which is the sixth largest metropolitan area in the United States with a population of 5,946,800. • Visitors can often enjoy the quiet surroundings of the preserve without the presence of large crowds. • The diversity of wildlife and plants contributes to the appealing scenery of the preserve. • Year-round, Village Creek continues to be one of the most popular canoe streams in Texas and is designated a “Texas Paddling Trail.” During long holiday weekends, up to 10,000 people canoe or kayak the creek. • The Teacher-Ranger-Teacher program has been extremely effective at Big Thicket National Preserve. Typically, the preserve has hired four teachers each summer to develop and present numerous educational programs in the preserve and at local schools, museums, and summer camps. • The public minimally perceives NPS presence, due to distribution of 15 preserve units across seven counties. • Other than the main trail heads near the Visitor Center, it can be difficult to navigate the preserve due to the number of smaller county roads (paved and unpaved) required to access preserve units. • Accessibility: The Staley Cabin and the Sundew, Pitcher Plant, and Kirby Nature trails are accessible. All picnic tables and restrooms are universally accessible. • Large amounts of trash can be common in popular fishing and day use areas. • The preserve issues approximately 2,000 hunting permits per year, allowing free public hunting in an area where most hunting is private. • Hunting and trapping can cause conflicts between user groups (i.e., hunters and nonhunters, motorboats and paddle sports, birdwatcher and waterfowl hunters, etc.). • Two major hurricanes and an extensive drought in 2011 have caused a notable change in the landscape of Southeast Texas. Many large old growth trees were lost. Blow-downs make trail travel very difficult for visitors (i.e., hikers, hunters, paddlers, etc.). • Homemade houseboats continue to contribute to water-quality degradation on the Neches River. • Annually, programs such as the Jason Project continue to help the preserve reach more than 10,000 youth of Southeast Texas. • The preserve continues to attract visitors from all over the world. • The preserve’s educational programs are currently curriculum-based. • The visitor center offers a dynamic opportunity to educate the public while providing a natural setting. • The visitor center Discovery Room has great potential for engaging visitors with hands-on, state-of-the-art exhibits on research, biodiversity, and more.

Fundamental Resource or Value	Visitor Experience in a Natural Setting
<p>Current Conditions and Trends</p>	<p>Trends</p> <ul style="list-style-type: none"> • Technological advances will change the way future generations approach the preserve. Visitors are becoming more and more self-reliant and using various websites to obtain information to plan their trips. Travel blogs are commonly used. • Staffing is limited and turnover is high, which breaks the continuity of projects and programs, inhibits the transfer of staff knowledge, and limits the breadth of staff understanding of the preserve. • The timber companies in Southeast Texas have been divesting their lands. In the past, many of the timber companies leased their land for hunting, which provided leasees year-round access and use of the property for other recreational purposes. Due to less land available for lease, illegal activities on the preserve, such as all-terrain vehicle use, have increased. • Over the last 26 years, the number of trappers applying for a permit has declined more than 95%, which illustrates a change in visitor use patterns. • The public continues to use the day use areas in the preserve; however, illegal and incompatible uses are also on the rise. • Hiking, biking, and canoeing/kayaking clubs are beginning to use the preserve's trails and waterways more frequently. • Fishing continues to be a popular sport in Southeast Texas. • During the last 10 years, fewer boating and/or land patrols are conducted due to a significant decrease in law enforcement staff. • Kayaking is the fastest-growing recreational activity in the U.S., and local canoe outfitters are seeing increases in the demand for shuttles for kayakers. • Mountain biking continues to increase in use in the region. The preserve has one biking trail, which is open for seven months of the year. • As the population of Southeast Texas continues to grow, there will be increased demand for recreational areas and for curriculum-based school programs.
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Low interpretative and educational staffing levels limit the number of visitor interactions, thereby limiting the opportunity to educate the public about the purpose and need of the preserve and its relevancy. • Low maintenance staffing levels limit trail and facility upkeep, which will degrade visitor experience and safety. • During the last 10 years, fewer boating and/or land patrols are conducted due to a significant decrease in law enforcement staff, which limits the preserve's ability to protect visitors and natural and cultural resources of the preserve. • Many GPS-based navigational systems provide inaccurate maps and directions to the preserve visitor center and units, causing many potential visitors to become lost and frustrated. • Unless the visitor stops at the visitor center, there is no sense of an NPS presence in the area of the preserve. • Some hunters do not feel that they need to obtain hunting permits because they rarely see law enforcement staff in the preserve. • Limited interpretive programs are offered due to lack of available staff, which limits visitor understanding of the purpose and significance of the preserve. • During hunting season it is difficult to warn all visitors (less than 10% of the visitors go to the visitor center) about hiking in an area open to hunting. • The continued lack of funding of the public education system in the area will limit the ability of teachers to bring their students to the preserve. • The mean annual temperature of the preserve will increase over time. A warmer climate could change visitation patterns with the potential to affect the visitor experience. • Elevated ozone levels can impact human health, causing respiratory irritation in preserve visitors and staff, limiting activities and jeopardizing the visitor experience when it reaches unhealthy levels.

Fundamental Resource or Value	Visitor Experience in a Natural Setting
Threats and Opportunities	<p>Opportunities</p> <ul style="list-style-type: none"> • An increase in interpretative staff would allow NPS interpretative rangers to interpret historic structures, archeological sites, and cultural landscapes. • An increase in protection staff would allow both an increase in chance encounters of NPS staff and visitors and increased protection of the preserve’s cultural and natural resources. • The Protection Division will continue to seek support from a wide array of law enforcement partners to assist the mission of the National Park Service. • The preserve’s enabling legislation permits the preserve’s expansion through donations. The continued sale of land in Southeast Texas will give the preserve an opportunity to increase in size. • The preserve will offer new technological-based programs, such as GPS-based recreational activities like virtual caches or canoe trails. • New technologies could be used to extend the range of low-impact visitor activities. • New auto-tour routes could be developed to link trailheads and hiking trails throughout the preserve. • The preserve could offer workshops to highlight the biological, historical, and cultural resources in the preserve using interpretative staff or subject matter experts. • Interpretation could use a rehabilitated Staley Cabin to provide living history programs. • Significant new and expanded interpretive and educational programming could be developed to help accommodate the increase in visitation, ecotourism, and to engage new audiences. • Curriculum-based programs could be developed to promote the preserve as a learning laboratory. Educational programming would integrate research and interpretive programs into the broader educational goals of communities and schools through partnerships. • Increased opportunities to issue special park use permits and commercial use authorizations could enhance visitor experience. • There are opportunities to use waterways for more interpretive, educational, and natural resource programs to draw youth out into nature. • With the Big Thicket Association’s acquisition of the Cardinal Cruise pontoon boat, the preserve has an opportunity to work with their friends group to provide educational programs on water quality, aquatic invertebrates, biodiversity, and more. • Increased interpretative and educational programs will teach the public, and especially the young, the value of the biodiversity of the preserve and will create future protectors of the preserve. • Visitors increasingly rely on social media (preserve website, Facebook) for information about the preserve. All social media should be used to increase awareness of the preserve. • Work with companies providing GPS-based information about the preserve. • Develop a Discovery Room that is dynamic and engaging. • Eastward expansion of the Houston metropolis will allow the preserve to serve more urban visitors. • The influences from climate change on natural and cultural resources present an opportunity to educate visitors on those influences through interpretive programs and exhibits at the preserve.
Existing Information About the Resource or Value	<ul style="list-style-type: none"> • The internet is a primary source of information. • The visitor center is a secondary source of information. • The preserve’s enabling legislation. • General management plan.

Fundamental Resource or Value	Visitor Experience in a Natural Setting
Data and/or GIS Needs	<ul style="list-style-type: none"> • Census information to answer questions such as “how many people are we reaching?” and “what low-income and minority populations can we better serve nearby?”
Planning Needs	<ul style="list-style-type: none"> • Trail management plan. • Wild and scenic river suitability study. • Park operations centralization plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Americans with Disabilities Act of 1990 (28 CFR 36) • Architectural Barriers Act of 1968 • Architectural Barriers Act Accessibility Standards 2006 • Clean Air Act of 1970, as amended • National Park Service Organic Act of 1916 • Rehabilitation Act of 1973 • NPS Concessions Management Improvement Act of 1998 • Resource Protection, Public Use and Recreation: Fishing (36 CFR 2.3) <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapters 4, 7, 8, 9, and 10) • NPS <i>Transportation Planning Guidebook</i> • Director's Order 6: <i>Interpretation and Education</i> • Director's Order 42: <i>Accessibility for Visitors with Disabilities in National Park Service Programs, Facilities, and Services</i>



<p>Fundamental Resource or Value</p>	<p>Free-flowing Water and Dependent Systems</p>
<p>Related Significance Statements</p>	<p>Big Thicket National Preserve has an extensive, dynamic system of hydrologic processes and associated dependent systems important to maintain the diverse yet specific ecological make-up of the Big Thicket. These include contiguous riverine and wetland systems. The preserve provides examples of blackwater systems, which are not typically found outside of the Amazon Basin and southeastern United States, and of rare baygall wetlands that exemplify the original and seemingly impenetrable Big Thicket.</p>
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • The preserve contains 240 miles of riparian waterways that are a major force in shaping the unique ecology and diversity of the Big Thicket, and serve as a geographic unifier for the preserve as well. Despite only an insignificant reference to water-oriented terminology in the narrative portion of the preserve’s enabling legislation, water is a dominant and unifying theme of Big Thicket National Preserve. • The presence and rate of flowing water in the preserve is most simply explained as a balance between rainfall and evapotranspiration. River and stream waters typically rise to a winter peak and recede during the summer into a fall baseflow condition on an average-annual basis, despite slightly higher rains in the summer and fall period. • The rise and fall of river stage and flow sets the rhythm of the preserve’s floodplain habitats: its bottomlands, the cypress sloughs, and the baygalls. • Water stage and flow, sediment load within the water column, and its flooding duration and seasonal timing all play important roles in maintaining the structure and function of the riparian corridor. Plants and animals that live in the river and floodplain have adapted to routine floods and the rhythm of soaking and drying out. • Low ridges, backwater sloughs, oxbow lakes, and terraces break up the overall flatness of the floodplain. It is these slight changes in the topography of the floodplain, coupled with the magnitude of the flood pulse that are key determinants to the ecology of the riparian corridor. • Closest to the river’s edge are the bottomland forests. Water moves quickly in and out of the bottomlands, scouring the forest floor and leaving it with a sparse understory. The closed canopy filters sunlight, further discouraging ground cover. • Slightly higher in the floodplain are the swamp forests of cypress and tupelo trees, commonly called cypress sloughs. The sloughs retain water for most or all of the year, but regular flooding flushes away organic debris preventing cypress sloughs from becoming acidic. • Bogs or seeps occur where water sinks through porous sandy soils and then hits an impermeable clay layer causing water to seep out to the surface. Leaching of the saturated soils creates acidic conditions. These acid bogs or acid seeps are usually open, grassy, and rich in plant species, including the four kinds of carnivorous plants that occur in Texas. • Where conditions are right, seep-fed creeks that drain bogs flow into forested swamps thick with evergreen shrubs. Baygalls are the highest-perched of the floodplain wetlands, but are considered a low-lying feature relative to the sandy uplands. • Wetland savannas or wet grasslands occur on claypan soils (Montgomery Formation) that trap rainwater but dry out in the summer, creating unique conditions. In such wetland savannas, stands of longleaf pines grow with evergreen shrubs, sedges and grasses, orchids, and carnivorous plants. • Of the streams in the preserve, Village Creek is most nearly typical of blackwater streams. Flows are unimpeded by diversions or retention along its entire 53-mile length. • Menard Creek and Little Pine Island Bayou are small and of variable flow like blackwater streams, but are more turbid and of higher conductivity like alluvial streams.

Fundamental Resource or Value	Free-flowing Water and Dependent Systems
Current Conditions and Trends	<p>Conditions (continued)</p> <ul style="list-style-type: none"> • Village Creek is a free-flowing stream threading through small sandbars, sloughs, and forest. Deep holes located in the creek are popular for swimming and wading, but visitors swim anywhere that they can access the stream. Year-round, Village Creek is one of the most popular canoe streams in Texas. During long holiday weekend, up to 10,000 people canoe/kayak the creek. • Big Sandy Creek is a free-flowing stream threading through small sandbars and forest. The creek is remote and lightly used. Visitors can enjoy a serene, private, wilderness experience. Deep holes located in the creek are popular for swimming and wading. • There were 13 violations of state water-quality standards and 4 exceedances of the state screening levels documented in calendar year 2012. • In March 2012, the Texas Department of State Health Services issued a fish consumption advisory for the entire reach of Village Creek and the Neches River upstream of Evadale due to elevated levels of mercury. • Impaired stream segments documented on the State of Texas 303(d)-list for the preserve are: (1) Neches River between saltwater barrier and B.A. Steinhagen reservoir and all tributaries—Mercury in fish, (2) Pine Island Bayou from mouth to mile 12.1—low dissolved oxygen and mile 12.1 to mile 35.4—low dissolved oxygen and bacteria, (3) Little Pine Island Bayou lower 25 miles—low dissolved oxygen and bacteria, (4) Village Creek from FM 418 to Lake Kimball—low pH and the entire stream for mercury in fish, (5) Beech Creek lower 20 miles for bacteria, (6) Big Sandy Creek lower 30 miles downstream from U.S. 190 for bacteria, and (7) Turkey Creek lower 25 miles for bacteria. There are also listed water bodies surrounding and draining into the preserve's water corridors listed for low dissolved oxygen, bacteria, and mercury in fish. <p>Trends</p> <ul style="list-style-type: none"> • In general, the preserve is experiencing a reduction of brines (less chloride and sulfate) but an increase in salinity on the Neches River downstream of the salt-water barrier. • In general, data from pH measurements, from 2007–2011, seems to be decreasing across all water-quality locations in the preserve and matching trends at a larger regional scale. • In the past century, both mean annual temperature and precipitation have increased in the region. • There are two primary and separate structures that continue to affect the preserve's interests along the Neches River: Town Bluff Dam and the Neches River Saltwater Barrier. These structures, along with the Sam Rayburn Dam, are operated in concert with each other for the purpose of maintaining a carefully calibrated water flow and stage regime in order to ensure delivery of water necessary to satisfy the water rights of end users and prevent saltwater intrusion from the heavily industrialized and dredged Sabine Lake estuary from fowling fresh water intakes. • Riparian level activities such as stream bed clearing (to lessen local flooding), construction of retention ponds, or erosion and watershed-wide activities such as logging, farming, oil and gas exploration and production, or land development activities may have altered, and continue to alter, the quantity and timing of freshwater flows over time. • The Neches River is especially vulnerable to taking on saltwater during times of low river flow or drought, a situation that has been worsened by dredging towards the river's mouth at Sabine Lake, near Port Arthur.

Fundamental Resource or Value	Free-flowing Water and Dependent Systems
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • New reservoirs could be built on the Neches River north of Big Thicket resulting in water resources being diverted to other basins. Diversions could disrupt native plant communities, affect wildlife, and compromise recreational opportunities. • Increased salinity in the Beaumont unit is a threat to cypress-tupelo swamps. • The U.S. Army Corps of Engineers (USACE) plan to deepen the navigational channel from the Gulf of Mexico to the Port of Beaumont from 40 to 48 feet will magnify the influence of tides and salinity on these preserve wetlands.³ • Overall, the preserve manages 8,250 acres in the Texas coastal zone. These lands are vulnerable to the effects of climate change that have been identified for coastal, riverine, and estuarine ecosystems, and are also subject to human-caused impacts from development and water use. • Basin-level threats: Control and utilization of water is a major issue of statewide importance in Texas. The flashy and unpredictable nature of its rainfall, combined with an uneven distribution of waters across the state—often least abundant where people and commercial needs lie—has resulted in a cycle of periodic floods and droughts in all areas of the state. • Watershed-level threats: The preserve is defined in part by the multiuse nature of its lands and the watershed that surrounds it. The watershed that envelops the preserve units is rapidly changing. Sensitive habitats and visitor experiences along the boundaries of the preserve have been and will be affected as adjoining lands are cleared for a variety of purposes such as pastures and residential yards or are paved for commercial development. • Riparian-level threats: The riparian flood pulse is an integral process to sustaining and protecting the unique aquatic flora and fauna of the preserve. However, the preserve’s desire to maintain the floodplain of Neches (and Trinity) River tributaries in a primitive state often generates negative publicity in the surrounding communities during instances of high flows and extensive overflow of riparian waters into the floodplain. <p>Opportunities</p> <ul style="list-style-type: none"> • Environmental flow standards have been set by rule for the Neches-Sabine watershed. The preserve is involved and needs to continue its involvement in the stakeholder process and technical committees as Texas reopens these rules for consideration and amendments. • The National Park Service and preserve staff needs to develop a working relationship with divisions of the U.S. Army Corps of Engineers in Galveston Island and Town Bluff to stay informed and provide input in decisions being made on the waterways because it directly affects the biodiversity of this preserve. • The preserve needs to develop and maintain relationships with the Texas Commission on Environmental Quality (TCEQ), and its Total Maximum Daily Loads (TMDL) Unit to encourage the state to complete TMDLs on impaired waters in the preserve and enforce water-quality violations.
Existing Information About the Resource or Value	<ul style="list-style-type: none"> • Natural Resources Foundation Report, Big Thicket National Preserve 2010. • Gulf Coast Network Water Quality Report Status of Water Quality of Big Thicket National Preserve, 2012. • Texas Commission on Environmental Quality, Chapter 298—Environmental Flow Standards for Surface Water.
Data and/or GIS Needs	<ul style="list-style-type: none"> • Detailed wetlands inventory of the entire preserve.

3. USACE (2009). *Draft Environmental Impact Statement for Proposed Sabine-Neches Waterway Channel Improvement Project, Southeast Texas and Southwest Louisiana, Volume II*. Galveston, TX. 1565 pp.

Fundamental Resource or Value	Free-flowing Water and Dependent Systems
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Wild and scenic river suitability study. • Resource stewardship strategy. • Watershed management plan. • Consider using scenario planning or other planning tools as appropriate to assess the impacts of climate change on preserve resources.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Wild and Scenic Rivers Act of 1968 • Clean Water Act of 1972 • National Park Service Organic Act of 1916 • Rivers and Harbors Act of 1945 • Executive Order 11514: “Protection and Enhancement of Environmental Quality” • Executive Order 11988, “Floodplain Management” • Executive Order 12088, “Federal Compliance with Pollution Control Standards” • Secretarial Order 3289. “Addressing the Impacts of Climate Change on America’s Water, Land, and other Natural and Cultural Resources” • National Flood Insurance Program (44 CFR 60) <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director’s Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (sections 4.6.1, 4.6.2, 4.6.4 and 4.8.1.1) • Director’s Order 77-1: <i>Wetlands Management</i> • Director’s Order 77-2: <i>Floodplain Management</i> • Special Directive 93-4, “Floodplain Management, Revised Guidelines for National Park Service Floodplain Compliance” (1993) • NPS Natural Resource Management Reference Manual 77



<p>Fundamental Resource or Value</p>	<p>Combined FRV Analysis Table for Biodiversity, Compositional Diversity, Structural Diversity, and Processes and Functional Diversity</p>
<p>Related Significance Statements</p>	<p>Big Thicket National Preserve, the first national preserve, was in essence set aside for its biodiversity. The preserve contains remnants of the Big Thicket of Texas and its diverse units are representative of the larger biogeographic region. The preserve serves as a refuge for a combination of plants, animals, and natural communities that include elements from the four distinct vegetation types: the distinct southwestern desert, central plain, eastern forest, and southeastern swamp. The preserve is the only park unit with this combination of resources. The opportunities for scientific research at the preserve include the study of biodiversity and disturbance resulting from land uses and natural phenomena (e.g., hurricanes and fires).</p>
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • The Big Thicket is a major ecological convergence zone harboring one of the most biologically diverse ecosystems in North America. These ecotonal interactions support unique community assemblages, which are dependent on the intermingling of the big river, small stream, and low gradient/bayou systems. • In recognition of its unique natural resources and diverse wildlife habitats, the United Nations Educational, Scientific and Cultural Organization designated Big Thicket National Preserve as an International Biosphere Reserve in 1981. In 2001, the American Bird Conservancy named the preserve as a Globally Important Bird Area. • The preserve is composed of five main forest types with subcategories within—upland pine forest (pine sandhill, pine forests, pine savanna wetland), slope forest (upper slope pine oak, mid-slope oak pine, lower slope hardwood pine), floodplain forest (stream floodplain forest, river floodplain forest, cypress tupelo swamp), flatland forest (flatland hardwood pine, flatland hardwood), and baygalls. • Currently, 89 different soil types have been recognized within Big Thicket National Preserve, and 131 soil map units are on the comprehensive soils legend. • The diverse soils, supported by the river systems, promote numerous vegetative communities, many of which harbor rare species such as Texas trailing phlox, scarlet catchfly, and Winkler’s gallardia. Subtle changes in topography also influence plant communities, producing unique wetland networks that link acid bogs, baygalls, cypress sloughs, and beech-magnolia hummocks to neighboring waterways. • Natural disturbances such as hurricanes, floods, fires, tornadoes, and fluvial geomorphological processes result in exemplary habitat diversity. • The white sand sandbars present on the creeks are home to a number of xerophytes and mesophytes, which can tolerate the shortage of precipitation and heavy stream flow. • The wide variety of fruit- and nut-bearing trees and shrubs provide an ample food source for the diverse bird and mammal species that reside within the preserve boundary. • Floristic inventories throughout the preserve have documented more than 1,500 vascular plant species. • Within the region, the Big Thicket provides important habitat connectivity in a highly fragmented landscape. The protection of a large portion of the Neches River floodplain and Menard Creek, a portion of the Trinity River system, ensures a dynamic web of habitat remains largely intact. • Many of the species found within the preserve represent glacial refugia—species whose distributions expanded during the last ice age but did not die out following glacial retreat. These populations may have a gene pool similar to that of northern populations. They may have also developed specific adaptations for the region that may not be found in the populations of their northern counterparts. • The entire Big Thicket ecoregion, with exception of some isolated patches, has been logged at least once. However, the preserve still maintains regionally significant tracts of beech-magnolia, floodplain forests, native river cane, palmetto flatwoods, and coastal and inland tracts of cypress.

Fundamental Resource or Value	Combined FRV Analysis Table for Biodiversity, Compositional Diversity, Structural Diversity, and Processes and Functional Diversity
<p>Current Conditions and Trends</p>	<p>Conditions (continued)</p> <ul style="list-style-type: none"> • The preserve is home to 60 mammal species, including cougar, coyotes, bobcats, opossums, mink, armadillo, and river otters.⁴ • The area is also home to 89 species of reptiles and amphibians, including 4 species of venomous snakes. • A total of 303 different species of birds have been documented in the preserve, including rare species such as the swallow-tailed kite, Bachman's sparrow, woodstorks, and roseate spoonbills. • The in-stream structure created by downed woody debris within the preserve's waterways creates ideal habitat for aquatic invertebrates and fish. • The preserve supports 70 known native fish species of which 2 are listed as species of special concern. Notable species of concern include suckers, catfish, minnows, shiners, and darters. The presence of marine transient species, such as needlefish, hogchoker, and striped mullet, moving upriver is unique to unimpounded Gulf Coastal river systems. Some fish species are critical hosts in the reproductive life cycle of mussels, many of which are species-specific. • The Neches River basin supports 42 of the 52 species of freshwater mussels found in the state of Texas. The Neches River basin is more diverse than the neighboring Trinity and Sabine River basins.⁵ Currently, there are 12 state-listed species of freshwater mussels in Texas, 5 of which occur within the Big Thicket. Three of these species (the triangle pigtoe, Louisiana pigtoe, and Texas heelsplitter) are currently under federal review for proposed listing as threatened or endangered. • Hurricanes Rita (2005) and Ike (2008) caused massive damage to preserve vegetation. Gaps were created throughout the canopies of the preserve; these gaps have become footholds for nonnative species invasion (i.e., Chinese tallow and Japanese climbing fern). • Big Thicket National Preserve falls within a county designated by the U.S. Environmental Protection Agency as a nonattainment area (exceeding) for the ground-level ozone standard of an eight-hour average concentration of no more than 75 parts per billion. <p>Trends</p> <ul style="list-style-type: none"> • The expansion of urban and suburban growth up to the preserve boundary will continue to have a substantial impact on regional biodiversity. As forest ecosystems are fragmented and total forest area is lost, changes in air quality, water quantity and quality, wildlife habitat, species composition, biodiversity, and soil quality occur. These changes significantly affect forest health and modify the goods and services provided by forest ecosystems.⁶ • Tropical storms and hurricanes in southeast Texas have caused coastal residents to move inland, which increases habitat fragmentation adjacent to the preserve. • As humans continue to develop the natural landscape, more natural disturbances (i.e., floods) are being mitigated to reduce the impact on neighboring communities. Due to this, the beneficial impacts from these natural "disasters" are not being realized within the preserve (i.e., maintenance of flood pulse-dependent vegetation). • In the past century, both mean annual temperature and precipitation have increased in the region. • Most lands donated to or purchased by the National Park Service are in poor condition, which require ongoing extensive restoration efforts. • Vegetative communities that are impacted by natural disturbances are now being taken over by invasive species. • As in other parts of the world, amphibians are declining at an alarming rate.

4. NPSpecies (2013). "Big Thicket National Preserve. Information on Species in National Parks." Available online at <<http://irma.nps.gov/NPSpecies/Search/SpeciesList/BITH>>. Accessed on November 25, 2013.

5. C. Stevens (USFWS Clear Lake Office) (2012). Big Thicket National Preserve, Personal Communications.

6. W. Zipperer (2002). "Urban Influences on Forest Ecosystems." In: *Human Influences on Forest Ecosystems: The Southern Wildland-Urban Interface Assessment*. E. A. Macie and L. A. Hermansen, eds. 2002. Gen. Tech. Rep. SRS-55. Asheville, NC: US Department of Agriculture Forest Service, Southern Research Station: 73-91.

<p>Fundamental Resource or Value</p>	<p>Combined FRV Analysis Table for Biodiversity, Compositional Diversity, Structural Diversity, and Processes and Functional Diversity</p>
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • Climate change, pollution (industrial and domestic), and encroachment all have the potential to negatively affect the features that contribute to the mosaic of habitats within the preserve. • An overall dryer landscape, which is projected, will influence the composition of the thicket. A reduction of freshwater on the landscape, with projected sea level rise, will contribute to salt water intrusion and threaten the fresh water ecology in parts of the park. • The divesting of buffer zones by timber companies will continue to have a negative impact on the preserve. • Industrial, commercial, and housing developments with their associated agricultural run-off will continue to be a source of contaminants entering the waterways of the preserve. • The presence and proliferation of nonnative species such as Chinese tallow, Japanese climbing fern, and kudzu is a threat to the native vegetation diversity. Salvinia, giant duckweed, and water hyacinth threaten vegetative communities within sloughs and ponds along the river. Feral hogs negatively impact vegetation, wildlife, and general ecosystem structure. Asian clams, common carp, grass carp, and redbreast sunfish, while nonnative, are currently not causing problems. There is also the potential for zebra and quagga mussel invasion. • Global climate change is projected to change weather patterns in the future, leading to greater temperature extremes, floods, and droughts, which will in turn increase the stress on flora and fauna in the preserve. • Development and urban sprawl around the preserve are threatening adjacent habitat, causing increased pressure on preserve wildlife. • The recently acquired lands south of the Lower Neches Valley Authority (LNVA) saltwater barrier are experiencing complications from saltwater intrusion. This floton-marsh and cypress-tupelo swamp is in danger of conversion to a saltwater marsh. • The water management and regulations on the Neches River are preventing high-flow events that lead to over-bank floods. This is endangering the flood pulse-dependent vegetation within the riparian area. • Dredging by the U.S. Army Corps of Engineers in the Neches River south of the preserve will cause nonnatural conditions and add to the impacts of sea level rise and subsidence, worsening saltwater intrusion. • Due to the meandering nature of preserve waterways, the Neches River will move outside of preserve boundaries in some areas, causing a disconnect in preserve resources and providing opportunities for rights-of-way to connect with the river that would not otherwise be available.

Fundamental Resource or Value	Combined FRV Analysis Table for Biodiversity, Compositional Diversity, Structural Diversity, and Processes and Functional Diversity
Threats and Opportunities	<p>Opportunities</p> <ul style="list-style-type: none"> • The sale of land in southeast Texas will continue to give the preserve the opportunity to increase in size as land is donated. • Partnerships with educational institutions, regional zoos, nonprofit environmental groups, and other government entities will allow the preserve to create a shared responsibility to protect biodiversity. • With continued habitat restoration and time, the preserve could be suitable habitat for threatened and endangered species including the Louisiana black bear (specifically the Canyonlands, Beaumont, and Lance Rosier units), the red cockaded woodpecker, and the Louisiana pine snake. • Some of the plant communities within the preserve are rare; this presents an opportunity to preserve them in perpetuity. • The preserve may be able to serve as a refuge for individuals and plant communities impacted by the extremes caused by global climate change. • In areas of dense overstory and midstory vegetation, increased restoration burning would create a well-managed fire-dependent ecosystem within the preserve, lessening the impacts of any future wildfires and increasing species diversity in the herbaceous layer. • There are ongoing opportunities through the regional haze and other air quality programs to work with state and federal air regulatory agencies and other stakeholders to address air quality impacts in parks from sources of air pollution.
Existing Information About the Resource or Value	<ul style="list-style-type: none"> • The preserve has specific point data for all of the collections made through the All Taxa Biodiversity Inventory. • As part of three-dimensional seismic survey compliance, the preserve has vegetation assessments for the Beaumont, Lance Rosier, Big Sandy, and Turkey Creek units. • As part of the fire ecology program, the preserve has mapped all known Texas trailing phlox locations. • As part of three-dimensional seismic survey compliance, the preserve has a complete wetland assessment for the Beaumont Unit. • As part of the Texas Mussel Watch Program, the preserve has location data for several state-listed mussel species. • The Natural Resources Foundation report provides a summary of the resources within the preserve and their current condition. • Data from the National Weather Service, U.S. Geological Survey, and others about floods, fires, hurricanes, and other natural extremes is available to the preserve, but has not been compiled into an easily digestible form. • Research has been conducted in the preserve since the 1970s regarding plant communities, long-term succession, and animal communities.⁷
Data and/or GIS Needs	<ul style="list-style-type: none"> • Vegetation alliance/association mapping for the entire preserve. • Corridor assessment to help the preserve understand the efficacy of the corridors for population connectivity. • Detailed wetlands inventory of the entire preserve. • A summarized weather history and weather outlook report for planning purposes.
Planning Needs	<ul style="list-style-type: none"> • Research prospectus. • Natural resources condition assessment. • Parkwide natural resources restoration planning document to guide restoration efforts. • Resource stewardship strategy.

7. Paul A. Harcombe, Elizabeth N. Hane, Jonathan P. Evans, Rosine W. Hall, Kathy A. Bruce, Keith C. Hoffman, Patrick D. Conant (1996). *Characterization of the Biological Resources of the Water Corridor Units of the Big Thicket National Preserve*. Prepared for the National Park Service, Big Thicket National Preserve.

Fundamental Resource or Value	Combined FRV Analysis Table for Biodiversity, Compositional Diversity, Structural Diversity, and Processes and Functional Diversity
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations that Apply to the FRV</p> <ul style="list-style-type: none"> • Endangered Species Act of 1973, as amended • National Invasive Species Act of 1996 • Federal Noxious Weed Act of 1974, as amended • National Park Service Organic Act of 1916 • Clean Water Act of 1972 • Clean Air Act of 1970, as amended • Executive Order 13112, "Invasive Species" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 (sections 1.6, 4.1, 4.1.4, 4.4.1, 4.7.2) provides general direction for managing park units from an ecosystem perspective • NPS Director's Order 18: <i>Wildland Fire Management</i> • NPS Natural Resource Management Reference Manual 77 • NPS Wildland Fire Management Reference Manual 18



Fundamental Resource or Value	Scientific Value
Related Significance Statements	The opportunities for scientific research at the preserve include the study of biodiversity and disturbance resulting from land uses and natural phenomena (e.g., hurricanes and fires).
Current Conditions and Trends	<p>Conditions</p> <ul style="list-style-type: none"> • Through the All Taxa Biodiversity Inventory initiative, 117,418 individuals have been recorded representing 2,714 species. Of these species, 12 are new to science, 28 are potentially new to science, and 131 are new to the state of Texas. • Development of science is an objective of the United Nations Educational, Scientific and Cultural Organization Biosphere Reserve designation. • The preserve provides access to scientific research in a region where there are few public lands. • The preserve’s status as a collection of protected areas within a working landscape provides opportunities to test numerous hypotheses in conservation biology and ecology. • The types of research that the preserve is particularly amenable to include <ul style="list-style-type: none"> • restoration of communities and ecosystems; nonnative plant biology and ecology • ecosystem resistance and resilience to natural and anthropogenic disturbance; of interest to managers is how resources respond to disturbances; generally, it is helpful to know the range of variation of “natural” disturbances • population ecology of species at the edge of their respective ranges, and in combination with other species within assemblages; this is directly relevant to climate change research and modeling • landscape ecology; this includes analyses of connectedness, fragmentation, corridors, and reserve design • ozone emissions from local (oil and gas development) sources and effects on biota • recreational opportunities and impacts • effects (in both directions) of timber harvest activities and protected area activities • climate change response • flood-pulse concept, natural flows, and flow variability • The NPS Fire Program has been collecting fire effects data, the All Taxa Biological Inventory and status and trend monitoring are underway, and researchers are coming back to the preserve. • Like any NPS unit, management efforts in the preserve are enhanced by a baseline of historical data and hindered to varying degrees by gaps of key resource information. Hydrologic monitoring is relatively robust, and the biological inventory is making progress, but many information gaps and uncertainties require further attention. For example, clear boundary descriptions are needed, as well as information on historic land use. • Many of the classification studies (vegetation, wetlands) have been completed as part of oil and gas compliance. • Two funded projects have supported the All Taxa Biotic Inventory in partnership with the Thicket of Diversity. • The NPS Integrated Resource Management Application has centralized scientific information in one database. <p>Trends</p> <ul style="list-style-type: none"> • Due to the funded projects for the All Taxa Biotic Inventory project, research in the preserve has increased. • Inventory and Monitoring responsibilities are being transferred to the park level as opposed to monitoring networks (i.e., amphibians and water quality).

Fundamental Resource or Value	Scientific Value
<p>Threats and Opportunities</p>	<p>Threats</p> <ul style="list-style-type: none"> • The primary threat to the scientific value of the preserve is the inability of science and conservation to keep up with the rapid pace of agricultural, industrial, residential, and water development growth in the Big Thicket region, and to compete against the economic incentives for this growth. • Decreased research funding and functional changes in the structure of Texas universities could limit future research. • Budget restrictions could lead to lower prioritization for research. For example, the once annual servicewide comprehensive call is now only issued once every three years. • The U.S. Geological Survey measures the streamflow in the region, but as recently as 2011 the agency shut down many of the key sites until local interests gathered funding to turn the gauges back on. • Big Thicket suffers from funding and staffing shortfalls that limit cultural and natural resources research and protection projects. In addition, staff turnover, which is an issue throughout the National Park Service, can result in short-lived projects and a lack of research continuity. <p>Opportunities</p> <ul style="list-style-type: none"> • There is a need to foster a regional outlook for advocating science and conservation within the Big Thicket region, in order to better protect and restore natural areas and processes within the preserve and throughout the Big Thicket region. • The preserve is an ideal genetics laboratory with many populations existing at the margins of their species distributions. These populations could help inform scientists about the rate of spread across the landscape or any landscape barriers that exist for certain species. • The preserve is located in an area where there are few public lands; therefore, the preserve serves as a science lab in a working landscape for research. • The preserve is slated to begin a natural resources condition assessment.
<p>Existing Information About the Resource or Value</p>	<ul style="list-style-type: none"> • Through the Research Permitting and Reporting System, the preserve has a record of all permitted research within the past years. • Natural Resources Foundation Report, Big Thicket National Preserve 2010.
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • None identified.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Research prospectus, including an annotated bibliography of the research done in the preserve (much like the Natural Resources Foundation Report) with a spatial component. This prospectus would also identify the need for many taxa to undergo inventory, such as insects and microbes. • Resource stewardship strategy. • Watershed management plan.
<p>Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Endangered Species Act of 1973, as amended • National Invasive Species Act • Federal Noxious Weed Act of 1974, as amended • National Park Service Organic Act of 1916 • Clean Water Act of 1972 • Clean Air Act of 1970, as amended • Executive Order 13112, "Invasive Species" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • Director's Order 6: <i>Interpretation and Education</i> • NPS Management Policies 2006 (sections 2.3.1.4, 4.2, 5.1)



<p>Fundamental Resource or Value</p>	<p>The Thicket</p>
<p>Related Significance Statements</p>	<p>Big Thicket National Preserve, the first national preserve, was in essence set aside for its biodiversity. The preserve contains remnants of the Big Thicket of Texas and its diverse units are representative of the larger biogeographic region. The preserve serves as a refuge for a combination of plants, animals, and natural communities that include elements from the four distinct vegetation types: the distinct southwestern desert, central plain, eastern forest, and southeastern swamp. The preserve is the only park unit with this combination of resources. The opportunities for scientific research at the preserve include the study of biodiversity and disturbance resulting from land uses and natural phenomena (e.g., hurricanes and fires).</p>

Fundamental Resource or Value	The Thicket
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • The term “thicket” may have developed from early travelers who made accounts of the difficulty in crossing baygall and swampy areas. While these vegetative communities were never so expansive to warrant the name thicket for an entire region, they were probably pervasive enough for travelers to frequently encounter them, leading to the perspective of impenetrable thickets. • Although more recent analyses have determined that species and communities found in Big Thicket are predominantly shared with those of the southeastern coastal plain,⁸ what can be said is that the thicket consists of high alpha- (within patch) and beta- (among patch) diversity,⁹ and that many species and communities are at the edge of their ranges (mostly southern and western edges of ranges).¹⁰ • The region’s varying topography and soils have been significantly influenced by its geologic history and processes, and the surficial geologic processes continue today to shape the landscape, particularly with respect to fluvial geomorphic features along the Neches River and its tributaries. • Taken together, the interplay of geology, topography, climate, water, and soils causes abrupt transitions in vegetation community composition. Topographic and soil conditions powerfully influence the local segregation of this rich concentration of plant species into distinctive plant communities.¹¹ • Although a formal condition assessment has not been conducted, clear indicators of degraded resources exist. At this time, it is estimated that about 3% of the remaining habitat in East Texas is considered intact. Logging and urban development were a major cause of habitat loss in the early part of the 1900s. • Soils and vegetative communities have been degraded in specific locations as a result of nonfederal oil and gas exploration, production, and transportation. • Big Thicket has been used as hunting and foraging ground by several American Indian tribes, including the Atakapa, Caddo, Creek, Alabama, and Coushatta. These tribes did not settle in the region because it was too difficult to farm; however, they created a series of trails and camps to access it for hunting and fishing. • In the mid-19th century, the margins of Big Thicket began to shrink slowly. European American settlers began to form small settlements along the waterways and the fringes of Big Thicket. These settlements typically consisted of a small community joined by a school and church. The early settlers were subsistence hunters, gatherers, and farmers, with a relatively small footprint. • In the post-Civil War era railroads were constructed throughout Big Thicket, which led to a logging boom across the region. Small company-owned communities developed at the railstops. • Following the oil and lumber booms, communities slowly died off, and the remaining inhabitants of Big Thicket largely returned to their lifestyles of hunting, fishing, and farming.

8. Michael H. MacRoberts, and Barbara R. MacRoberts (2007). “Phytogeography of the Big Thicket, East Texas.” *Journal of the Botanical Research Institute of Texas* 1:1149–1155.

9. Marks and Harcombe (1981). “Forest Vegetation of the Big Thicket, Southeast Texas.” *Ecological Monographs*: 287–305.

10. Michael H. MacRoberts, and Barbara R. MacRoberts (2007). “Phytogeography of the Big Thicket, East Texas.” *Journal of the Botanical Research Institute of Texas* 1:1149–1155.

11. J. B. Callicott, M. F. Acevedo, P. Gunter, P. Harcombe, C. Lindquist, M. Monticino (2006). “Biocomplexity in the Big Thicket.” *Ethics, Place and Environment* 9, no. 1:21–45.

Fundamental Resource or Value	The Thicket
Current Conditions and Trends	<p>Trends</p> <ul style="list-style-type: none"> • Urban development was a major cause of habitat loss in the early part of the 20th century, as was logging. • Bottomland forests along many rivers have been completely converted. • Longleaf pine areas have been converted to loblolly or slash pine plantations or severely fire suppressed. • Large timber companies have recently been selling their lands to developers as companies look for sources of revenue. This has caused the preserve to lose its pine plantation buffers that provided habitat adjacent to the preserve's narrow corridors. • Positive trends include the establishment of invasive plant control, reestablishment of fire on portions of the fire-adapted landscape, the reinvigoration of science manifested in resource inventories (including the All Taxa Biological Inventory), and status and trend monitoring of select resources.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • Poaching, illegal dumping in the Neches River and other streams, and all-terrain vehicle use are concerns through Big Thicket. • With respect to fluvial geomorphic processes occurring along the Neches River, NPS staff have observed that bank erosion and stream channel migration at specific locations has caused the river to encroach upon, and in some cases transgress, boundaries of the preserve. • Biological invasions represent a significant threat to the preserve, as they can not only negatively affect individual species, but can influence ecosystem properties such as fire, and thereby change the entire nature of Big Thicket. • Fragmentation of the landscape is a continued threat. Landscape processes such as fires and floods, and predation and herbivory patterns of wide-ranging species will not occur within a natural range of variation. • Atmospheric deposition of mercury has the potential to harm fish and wildlife in the preserve. • Nitrates, ammonium, and sulfates from the atmosphere can deposit into ecosystems through rain or dryfall, and cause acidification or eutrophication (unnatural enrichment) of waters and soils. <p>Opportunities</p> <ul style="list-style-type: none"> • There is an opportunity to interpret the historic condition of Big Thicket. • There is an opportunity for interpretive staff to use documented oral histories about Big Thicket.
Existing Information About the Resource or Value	<ul style="list-style-type: none"> • Existing information about this value is summarized nicely in the Natural Resources Foundation Report, 2010.
Data and/or GIS Needs	<ul style="list-style-type: none"> • None identified.
Planning Needs	<ul style="list-style-type: none"> • None identified.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	<p>Laws, Executive Orders, and Regulations That Apply to the FRV</p> <ul style="list-style-type: none"> • Executive Order 13112, "Invasive Species" • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS Management Policies 2006 • Director's Order 75: <i>Civic Engagement and Public Involvement</i>

Analysis of Other Important Resources and Values

Other Important Resource or Value	Cultural Resources
<p>Related Significance Statements</p>	<p>Big Thicket National Preserve has a rich cultural history spanning centuries and cultures—prehistoric to modern American Indians, Spanish explorers, and early settlers to today’s modern users. Resources include remnants of historic land use activities and structures, traces of travel corridors, and archeological sites.</p>
<p>Current Conditions and Trends</p>	<p>Conditions</p> <ul style="list-style-type: none"> • Big Thicket National Preserve has archeological and ethnographic resources, as well as cultural landscapes and historic properties. • Archeological and other cultural resources have been identified, documenting the presence of early prehistoric peoples, American Indian inhabitants, and European Americans who settled and pursued industrial activities in the area primarily during the latter 19th and early 20th centuries. • The preserve retains prehistoric encampments, historic homesteads, logging camps and mills, roads and trails, oil and gas production sites, and other sites and material remains that document patterns of historic land use and adaptations to the regional environment. Many of these resources retain cultural importance for traditionally associated peoples, such as the Alabama-Coushatta Tribe of Texas and the descendants of European American settlers. • A complete inventory of archeological resources within Big Thicket National Preserve has not been conducted, although, several surveys have been conducted in recent years ahead of oil and gas 3-D seismic surveys in the Beaumont, Neches Bottom and Jack Gore Baygall, Big Sandy Creek, Turkey Creek, and Lance Rosier units. New discoveries are frequently found and formally documented through oil and gas development and not through research directed at answering specific questions or developing the prehistoric and historic archaeological context of the preserve. • More than 30 archeological sites are documented within the preserve. • Prehistoric sites, although not numerous, do occur within the preserve. • Historical sites occur throughout the preserve and consist of material remains of European American occupation of the Big Thicket from early 1800s through the mid-20th century. No archeological sites from these early historic periods are known, but many remains from the latter half of the 19th and first half of the 20th century can be found throughout the preserve. • The preserve has a potentially significant historic structure eligible for the National Register of Historic Places—the Staley Cabin—a significant example of homesteading in the Big Thicket area of east Texas in the early 20th century. The cabin was determined to be eligible on September 20, 2013. The cabin is not in its original location and the interior has been modified and was once used as a visitor contact station. The interior modifications include indoor plumbing sheetrock, and carpeting. • The preserve is made up of 15 units that all share some historical and ethnographic properties. Of the five Indian tribes (Atakapa, Caddo, Creek, Alabama, and Coushatta) that had historic-era associations with the region, only the Alabama and Coushatta remain in the region. The Alabama-Coushatta Reservation adjoins Big Sandy Creek Unit.¹² • Though Big Thicket National Preserve has not been inventoried parkwide for cultural landscapes, a phase I cultural landscape inventory and associated map¹³ was completed for historic tram routes in Big Thicket National Preserve. • Preserve staff has not completed a survey of ethnographic resources.

12. S. W. Moss (1998). *Communities Affiliated with the Big Thicket National Preserve*. Austin, TX.

13. Shapins Associates (2004). *Historic Tram Routes: Cultural Landscape Inventory, Big Thicket National Preserve, National Park Service*. Cultural landscape Inventories. NPS Intermountain Regional Office; Shapins Associates. Big Thicket National Preserve, Texas/ Intermountain Regional Office.

Other Important Resource or Value	Cultural Resources
Current Conditions and Trends	<p>Trends</p> <ul style="list-style-type: none"> • The population of long-time members of the community is aging. Over time, oral histories could be lost. • Because of the climate in the region, cultural resources that are above ground are deteriorating quickly.
Threats and Opportunities	<p>Threats</p> <ul style="list-style-type: none"> • The primary challenge of cultural resources stewardship is the preserve's lack of any cultural resource specialists. As a result, cultural resources do not get adequate attention, and many are at risk of not being discovered and appropriately documented. • Funding shortages make it difficult for regional staff to assist with preserve cultural needs and the backlog of cultural work. • Nearby development and boundary trespass as well as other illegal activities, particularly when the ground is disturbed, could damage or remove cultural resources from the preserve. • Among the anticipated consequences of climate change are the heightened intensity and frequency of severe storms and hurricanes. These factors present potential threats to buried archeological resources in the preserve as storms contribute to rising water levels, perhaps inundating sites in low-lying areas, or along streams, and rivers. Intensified storm-related floodwaters may also accelerate soil erosion, leading to the disturbance and loss of vulnerable sites. • Cultural resources could be inadvertently damaged because a comprehensive survey has not been completed. • Adjacent land uses, such as oil and gas and timber operations, could have negative impacts on cultural resources in the preserve. • Lack of a consistent NPS presence increases the probability of illegal activity related to cultural resources. <p>Opportunities</p> <ul style="list-style-type: none"> • Submit a formal nomination to the National Register of Historic Places for the Staley Cabin. • Return the exterior of the Staley Cabin to historic conditions by removing additions and replacing rotten exterior materials with comparable materials to maintain its appearance. • The Voth Mill site is significant for its association with the lumber industry but it has lost sufficient historic integrity to be eligible for the National Register of Historic Places. However, the site still holds interpretive opportunities for a typical east Texas sawmill during the first half of the 20th century. • Increase collaboration with the Alabama-Coushatta Tribes of Texas in interpretative programing. • Increase collaboration with local historic societies. • Although the visitor center provides literature for sale, there is an opportunity to have established exhibits on local cultures. • Inventory entire preserve for cultural landscapes.
Existing Information About the Resource or Value	<ul style="list-style-type: none"> • The first professional archeological survey of Big Thicket National Preserve was conducted by Texas A&M University in 1974–1975, with surface investigations conducted in all preserve units established at that time. No subsurface shovel testing was conducted. Although limited in scope, the investigations established a valuable regional context for the preserve's archeological resources.

Other Important Resource or Value	Cultural Resources
<p>Existing Information About the Resource or Value</p>	<ul style="list-style-type: none"> • There are seven landscapes listed in the cultural landscape inventory database, including Big Thicket National Preserve parkwide. An additional cultural landscape—Historic Tram Routes—is not listed. Two cultural landscape inventory projects have been completed at the preserve: 1) the inventory for Voth Mill (which found this landscape ineligible as a historic district); and 2) phase I of the Historic Tram Routes inventory. Phase II is needed to determine eligibility.
<p>Data and/or GIS Needs</p>	<ul style="list-style-type: none"> • Cultural landscape report as needed for the cultural landscape inventories in the preserve. • Cultural resource management data. • Ethnographic overview and assessment. • Parkwide cultural landscape inventory. • Parkwide archeological assessment. • Update museum collection catalog.
<p>Planning Needs</p>	<ul style="list-style-type: none"> • Historical American Buildings Survey stabilization and management plan for Staley Cabin. • Cultural resource management plan. • Resource stewardship strategy.
<p>Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance</p>	<p>Laws, Executive Orders, and Regulations That Apply to the OIRV</p> <ul style="list-style-type: none"> • The Antiquities Act of 1906 • National Historic Preservation Act of 1966, as amended (16 USC 470) • Archeological and Historic Preservation Act of 1974 • Archeological Resources Protection Act of 1979 • American Indian Religious Freedom Act of 1978 • Historic Sites Act of 1935 • Museum Act of 1955, as amended • Native American Graves Protection and Repatriation Act of 1990 • Executive Order 13007, "Indian Sacred Sites" • Executive Order 11593, "Protection and Enhancement of the Cultural Environment" • Secretarial Order 3289. "Addressing the Impacts of Climate Change on America's Water, Land, and other Natural and Cultural Resources" • <i>The Secretary of the Interior's Standards for Archeological Documentation</i> • <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> • <i>The Secretary of the Interior's Standards for the Treatment of Historic Properties</i> • 36 CFR 79 "Curation of Federally Owned and Administered Archeological Collection" • 36 CFR 800 "Protection of Historic Properties" <p>NPS Policy-level Guidance (NPS Management Policies 2006 and Director's Orders)</p> <ul style="list-style-type: none"> • NPS <i>Management Policies 2006</i> (chapter 5) • NPS <i>Museum Handbook</i>, parts I, II, and III • Director's Order 24: <i>NPS Museum Collections Management</i> • Director's Order 28: <i>Cultural Resource Management</i> (1998) • Director's Order 28A: <i>Archeology</i> (2004) • Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (2008)

Identification of Key Issues and Associated Planning and Data Needs

This section considers key issues to be addressed in planning and management, and therefore takes a broader view over the primary focus of part 1. A key issue focuses on a question that is important for a park. Key issues often raise questions regarding park purpose and significance, and fundamental and other important resources and values. For example, a key issue may pertain to the potential for a fundamental or other important resource or value in a park to be detrimentally affected by discretionary management decisions. A key issue may also address crucial questions not directly related to purpose and significance, but still indirectly affects them. Usually a key issue is one that a future planning effort or data collection needs to address and requires a decision by NPS managers.

The following are key issues for Big Thicket National Preserve and the associated planning and data needs to address them:

Key Parkwide Issues	Planning and Data Needs	Rationale
Climate change	Consider using scenario planning or other planning tools as appropriate to assess the impacts of climate change on preserve resources	As the planet's climate changes over time, mobile resources may shift location, and there may be other impacts on underlying geology, hydrology, vegetation, and other systems. NPS staff can record these changes and interpret them for visitors and scientists. Preserve managers must consider what actions may be taken to deal with the impacts that climate change brings to the preserve and what strategies for adaptation may be considered.
Staffing	Business plan	As staffing continues to decrease, the preserve is unable to continue to operate at the same level and must refocus its priorities. Additionally, use of facilities must be refocused. A business plan would address staffing issues and improve the ability to measure the allocation of fiscal resources against needs within the preserve. Partnerships and collaboration could be helpful in this effort.
Park operations	Finish Climate Friendly Parks program (already completed Climate Leadership in Parks tool, which gauges carbon emissions); park operations centralization plan	The preserve could be more efficient and sustainable in its operations. The preserve has staff in six different locations. The preserve needs to reevaluate housing needs and consider disposing of excess housing.
Accessibility	Accessibility assessment; accessibility plan	Accessibility concerns would address both facilities and visitors (Americans with Disabilities Act-related).

Key Parkwide Issues	Planning and Data Needs	Rationale
<p>Law enforcement</p> <ul style="list-style-type: none"> • Drug and alcohol offenses • Off-road vehicle (ORV) travel • Unsafe boating operations • Illegal activities associated with large crowds, littering, public intoxication, etc. 	<p>Law enforcement needs assessment; visitor use management plan</p>	<ul style="list-style-type: none"> • Partnerships and collaboration could be helpful for management of law enforcement issues. • Drug and alcohol offenses are life, health, and safety issues that can lead to injuries and death. This issue is closely linked to needed staff to increase patrols. An analysis of data is needed as well as a comparison with the incidence numbers from other agencies and organizations. • ORV use is not allowed in the preserve, though data show that continued use of ORVs in the preserve continues. The preserve needs a strategy for more effective enforcement and outreach regarding ORV use. This issue also relates to the boundary issue, and oil and gas pipeline issue. • Staffing numbers need to be increased in order to make stops, boardings, and conduct safety checks on boaters in the preserve. Furthermore, a communication and outreach strategy is needed. The National Park Service could partner with the U.S. Coast Guard outreach program. • Overcrowding in popular areas such as 96 bridge, Lake view, and the Village Creek stretch is common, and presents a visitor use and user capacity issue for the preserve. Rowdy visitors often deter family-oriented visitors from using some day-use areas. Rope swings constructed over the river cause safety issues. A visitor use management plan would address strategies for limiting use levels in different areas.
<p>Access</p>	<p>Compilation of right-of-way (ROW) access and easements (data); strategic approach to addressing access issues including public relations (plan)</p>	<p>There are large portions of land and water in the preserve that are very difficult to access, both administratively and for public access. Private land surrounding all of the preserve cannot be used to access some roads within preserve units. The preserve has a geodatabase of adjacent landowners, but the ROW access and easements haven't been mapped spatially. A next step in this process would be to identify priority points of access according to those spatial data and make administrative commitments for access. The preserve could compile information into a strategic plan for access, including boat ramps and parking lots.</p>
<p>Nonnative species</p>	<p>Included in the parkwide natural resources restoration plan to identify strategy for removal</p>	<p>The preserve is valued for its biodiversity, and nonnative species may jeopardize some aspects of the preserve's core mission. Management and identification of species and of existing conditions and management strategies for moving forward are needed. Elimination is unfeasible.</p>

Key Parkwide Issues	Planning and Data Needs	Rationale
Poaching and vandalism	Need data concerning numbers of poaching and vandalism (e.g., through surveillance cameras, hot spots, etc.); then incorporate into the law enforcement needs assessment	Poaching of plants and animals, illegal lumbering, vandalism, and removal of preserve property are all issues. The preserve could partner with other law enforcement agencies to gather data and numbers.
Boundary issues/ marking	Strategy to accurately mark and then cyclically remark boundary	There are more than 615 miles of preserve boundary, and marking the boundary is a large part of the deferred maintenance costs. Frequency of painting trees and putting up signs needs to be increased, though accuracy of these markers is difficult to ascertain after hurricanes and fires. Fencing is a less feasible option, and blazes and tree marking are more effective.
Habitat conservation	Habitat conservation plan (collaborative effort with U.S. Fish and Wildlife Service) for red cockaded woodpecker, mussel species, and potentially in the future the Louisiana black bear	This is needed as the U.S. Fish and Wildlife Service lists species or develops recovery plans.
Oil and gas pipelines / Rights-of-way	Jurisdictional compendium for oil and gas pipelines; oil and gas operator's handbook	The oil and gas management plan does not address pipelines, often involving hazardous materials. Pipeline management is a large legal issue because the owners have easements. Oil and gas also has negatively impacted a wide range of resources in the preserve. Aspects of oil and gas areas that have been impacted could be discussed in the restoration plan.
Visitor/commercial use	Commercial services plan	There are no commercial use authorizations issued, yet there are three canoe liveries and rental companies operating in the preserve. Visitors occasionally request other commercial services.

Key Parkwide Issues	Planning and Data Needs	Rationale
Feral animals	Integrated pest management plan	The preserve is currently handling the problem of feral animals and stray pets to the best of its ability, though residents in the area continue to abandon pets in the preserve. Currently, the preserve records feral animal incidents, has written an internal policy document for feral animals and stray pets, and is working on completing a hog management plan. Public information could be developed to help prevent dumping, and an integrated pest management plan could help address potential future invasive species.
Boat ramp locations and conditions	Needs assessment analysis to determine whether to sustain the boat ramps	Riverine boat ramps are difficult to maintain. NPS employees often use non-NPS boat ramps because they are in better condition than the NPS boat ramps, which ultimately makes it more difficult to reach mission-critical locations. The preserve needs to assess boat ramps and current condition, and then make a plan for repairing or removing. Condition assessment is conducted through the Facility Management Software System.
Configuration of preserve size and shape	Operations review and planning	District operations have been used in the past for law enforcement. Current staffing levels have decreased, thereby limiting the ability to accommodate district operations. This topic also relates to the access discussion.



Planning and Data Needs

To maintain connection to the core elements of the foundation, and the importance of these core foundation elements, the planning and data needs listed here are directly related to protecting fundamental resources and values, park significance, and park purpose, as well as addressing key issues. To successfully undertake a planning effort, information from sources such as inventories, studies, research activities, and analyses may be required to provide adequate knowledge of park resources and visitor information. Such information sources have been identified as data needs. Geospatial mapping tasks and products are included in data needs.

Items considered of the utmost importance were identified as high priority, and other items identified, but not rising to the level of high priority, were listed as either medium- or low-priority needs. These priorities inform park management efforts to secure funding and support for planning projects.

Planning Needs – Where a Decision-making Process Is Needed			
Related to an FRV, OIRV, or Parkwide Issue?	Planning Needs	Priority (H, M, L)	Notes
Visitor experience	Trail management plan	H	This plan would help determine the placement and management of trails within the preserve.
Visitor experience, Parkwide	Park operations centralization plan	H	This plan is needed due to the small number of staff scattered across six operational locations. This will decrease overhead costs and allow for increases in staffing. An analysis of the needs of staff in the outlying locations needs to be conducted in order to successfully bring them to the centralized location at headquarters.
Cultural resources	Historical structure report with stabilization and management recommendations for Staley Cabin	H	This plan would be to return the Staley Cabin to a period-correct homestead. The Staley Cabin is the best example the preserve has of living heritage. The Staley Cabin has a determination of eligibility written for submission to the state historic preservation officer. The cabin and setting is valuable to the cultural landscape and visitor experience. The cabin becomes more vulnerable to loss of integrity over time.
Biodiversity	Natural resources condition assessment	H	This plan evaluates current conditions, identifies critical data gaps, and highlights some notable resource condition influences for a subset of a park unit's important natural resources. It is slated to begin in 2014, and be completed in 2016.
Biodiversity	Parkwide natural resources restoration planning	H	This plan will guide natural resource restoration efforts, including the potential impacts of climate change and management actions to mitigate impacts. Because restoration funding is available periodically, this plan will help guide actions. It will address a lack of canopy, establish a desired canopy for trails to help better maintain it, and include strategies for nonnative species management.
Parkwide	Law enforcement needs assessment	H	Need data concerning numbers of poaching and vandalism incidents (e.g., through surveillance cameras, hot spots, etc.).
Parkwide	Strategy to accurately mark and then cyclically remark boundary	H	This plan is needed for resource protection and visitor safety. There are areas where people encroach on the boundary either intentionally or unintentionally. The plan can be written in-house.

Planning Needs – Where a Decision-making Process Is Needed			
Related to an FRV, OIRV, or Parkwide Issue?	Planning Needs	Priority (H, M, L)	Notes
Parkwide	Commercial services plan	H	This plan is directly related to visitor experience, and would help address commercial use authorizations and address visitor safety issues. The development of the plan would require outside expertise.
Visitor experience, Water	Wild and scenic river suitability study	M	This study would be conducted for the waterways within the preserve to determine whether they are eligible and suitable for wild and scenic river designation and inclusion into the wild and scenic rivers system. An eligibility assessment has already been conducted and determined that seven of the eight segments analyzed were eligible. Determination of suitability is the next step in this process.
Cultural resources	Cultural resource management plan	M	This plan is needed to consolidate a wide array of possible plans and studies that may be undertaken by NPS staff to enhance understanding and treatment of the preserve's historic properties and cultural resources. Among these are archeological resource overviews, historic structure reports, historic resource studies, cultural landscape inventories and reports, ethnographic overviews and assessments, cultural affiliation studies, oral histories, and museum collections management reports. Correlated to a high-priority need for data related to cultural resources.
Water, Cultural resources, Biodiversity, Scientific	Resource stewardship strategy	M	<p>This plan develops resource stewardship strategies that serve as a bridge between the qualitative statements of desired conditions for resources and resource condition-dependent visitor experiences established in the preserve's general management plan and the measureable goals and implementation actions determined through park strategic planning. This analytical document focuses on identifying and tracking indicators of desired resource conditions, recommends comprehensive strategies to achieve and maintain desired conditions over time, and assesses and updates these comprehensive strategies periodically based on new information and the results of completed activities. A resource stewardship strategy provides an approach for investing both human and fiscal resources in resource stewardship. It also reports accountability toward progress in attaining and maintaining desired resource conditions.</p> <p>Comprehensive strategies in a resource stewardship strategy for Big Thicket National Preserve would probably include further necessary planning efforts such as a hunting management plan, integrated pest management plan, and water corridor or comprehensive river management plan, depending on whether the Neches River and tributaries are determined eligible and suitable for wild and scenic river designation. This effort would follow a resource condition assessment.</p>

Planning Needs – Where a Decision-making Process Is Needed			
Related to an FRV, OIRV, or Parkwide Issue?	Planning Needs	Priority (H, M, L)	Notes
Biodiversity, Scientific	Research prospectus	M	This is a research planning document to signal current management needs to researchers. The plan is also related to visitor experience and education and outreach programs as new information is learned about the preserve. Research will help inform management and assist with decision making. For example, this plan could help identify the need for a wildlife corridor assessment, help understand the efficacy of the corridors for population connectivity, as well as identify that many taxa require further attention and inventory. Further, this plan effort would include an annotated bibliography of the research conducted in the preserve (much like the Natural Resources Foundation Report) with a spatial component.
Other	Hunting management plan	M	This plan is needed because regulations for hunting in the preserve were mandated by law. The preserve does not have a hunting management plan. This plan is directly related to visitor experience.
Parkwide	Accessibility plan	M	This plan is needed to assist with the designation and design of trails to meet Americans with Disabilities Act standards. This would provide a tool to acquire the funding to upgrade those trails.
Parkwide	Oil and gas operator's handbook (for mitigation measures); separate from a national plan	M	This plan could be a blueprint for other parks with pipelines. It would be an internal document.
Parkwide	Integrated pest management plan (to address potential future invasive species)	M	This plan is needed to coordinate an integrated pest management group and would develop the degree of reasonableness to control or eliminate pests and invasive species. Not having this plan would not stop the preserve from continuing to manage pests, but the completion of this plan would make the management of pests more strategic.
Parkwide	Consider using scenario planning or other planning tools as appropriate to assess the impacts of climate change on preserve resources	M	The national parks, because of their location and unique, protected resources, are places where the effects of these changes are particularly noticeable. With the establishment of the National Park Service in 1916, responsibility was given to the service to preserve and protect the significant resources within the parks for the enjoyment of future generations. As knowledge about climate change and its effects has accumulated, it has highlighted the need to identify effects of climate change and apply adaptive management strategies to mitigate impacts.

Planning Needs – Where a Decision-making Process Is Needed			
Related to an FRV, OIRV, or Parkwide Issue?	Planning Needs	Priority (H, M, L)	Notes
Parkwide	Finish Climate Friendly Parks program (already completed Climate Leadership in Parks tool, which gauges carbon emissions)	M	Helps the park measure its greenhouse gas emissions, set emission reduction targets, and then compare activities or actions that will help them reach reduction targets.
Parkwide	Strategic approach to addressing administrative access issues (including public relations with neighbors)	M	This plan would reduce the vulnerability of resources without access. The preserve has started the process by developing a geodatabase, working with the Inventory and Monitoring network, as well as working with neighbors. There is an indirect relationship of this plan to multiple FRVs.
Parkwide	Operations review and planning	M	As major changes occur in the preserve and staffing levels change over time, a review could be helpful to have outside input on how the National Park Service is managing the preserve with changing staffing levels.
Scientific, Water	Watershed management plan	L	This plan is needed to foster a regional outlook for advocating science and conservation for Big Thicket National Preserve, and to work in partnership with local/county/state partners. Managing at a watershed scale helps protect resources of the preserve. Reasonableness of managing in coordination is low.
Parkwide	Business plan	L	This business plan is needed to address staffing issues and to improve the ability to measure the allocation of fiscal resources against needs within the preserve.
Parkwide	Habitat conservation plan (collaborative effort with the U.S. Fish and Wildlife Service) for red cockaded woodpecker, mussel species, and potentially in the future the Louisiana black bear	L	These habitat conservation plans would be initiated by the U.S. Fish and Wildlife Service, and cannot be initiated by the National Park Service. Mussel species are not listed yet, and this effort can be reevaluated when they are listed.
Parkwide	Visitor use management plan	L	This plan would help the preserve understand how visitors are using the preserve and identify ways that we could better manage some of those activities.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Parkwide Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Cultural resources	Cultural resource management data	H	A wide array of possible plans and studies may be undertaken by NPS staff to enhance understanding and treatment of the preserve's historic properties and cultural resources. Among these are archeological resource overviews, historic structure reports, historic resource studies, cultural landscape inventories and reports, ethnographic overviews and assessments, cultural affiliation studies, oral histories, and museum collections management reports.
Cultural resources	Ethnographic overview and assessment	H	The data would include interviews with those who have a connection with the preserve, including consultation with traditionally-associated American Indian tribes to identify traditional cultural properties and sacred places.
Cultural resources	Update museum collection catalog	H	NPS museum collections include diverse disciplines and have unique associations with park cultural and natural resources, eminent figures, and park histories. These data are needed for the cultural resources management plan.
Parkwide	Compilation of right-of-way access and easements	H	These data would help staff with boundary marking, access, and resource protection. This data acquisition would be needed before development of a boundary-marking strategy.
Parkwide	Accessibility assessment	H	These data are needed to develop an accessibility plan.
Water, Biodiversity	Detailed wetlands inventory of the entire preserve	H	The current national wetlands inventory is only approximately 50% correct for the preserve and needs to be updated. These data will be needed to inform the trail management plan and the oil and gas program.
Biodiversity	Vegetation alliance/ association mapping for the entire preserve	H	These data are needed to inform the natural resources restoration plan. While this mapping is already completed for some units of the preserve, it is very expensive and could be more reasonable at a smaller scale through a contractor. A botanist with the Gulf Coast Network could help with this effort.
Parkwide	Data concerning numbers of poaching and vandalism incidents (e.g., through surveillance cameras, hot spots, etc.)	H	These data would help inform the law enforcement needs assessment.
Cultural resources	Cultural landscape report	M	A cultural landscape inventory would need to be developed prior to the development of this cultural landscape report. A cultural landscape report would provide the park with landscape treatment guidance not included in the cultural landscape inventory.
Cultural resources	Parkwide cultural landscape inventory	M	These data are important because the preserve has not been inventoried for cultural landscapes. There are seven landscapes listed in the cultural landscape inventory database, including Big Thicket National Preserve parkwide. An additional cultural landscape—Historic Tram Routes—is not listed. Two cultural landscape inventory projects have been completed at the preserve: 1) the inventory for Voth Mill (which found this landscape ineligible as a historic district); and 2) phase I of the Historic Tram Routes inventory. Phase II is needed to determine eligibility.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Parkwide Issue?	Data and GIS Needs	Priority (H, M, L)	Notes, Including Which Planning Need This Data Need Relates To
Parkwide	Needs assessment analysis for boat ramps maintenance	M	These data are directly related to visitor experience and health and safety.
Cultural resources	Parkwide archeological assessment	M	These data are needed due to the lack of a systematic archeological assessment in the preserve. For example, new discoveries are frequently found through oil and gas development, rather than through research directed at answering specific questions or developing the prehistoric and historic archeological context of the preserve. Archeological resources locations are unknown, most are in situ, and a comprehensive archeological survey of the preserve has not been undertaken to date. The limited extent of surveys, with correspondingly few sites recorded, has contributed to what some archeologists consider a misconception that prehistoric peoples found the Big Thicket an inhospitable wilderness and largely avoided the area except for occasional hunting forays. An alternative perspective suggests the scarcity of identified sites in the Big Thicket may be attributed to inadequate survey and testing strategies, compounded by dense vegetation and other factors that have concealed sites and impeded investigations. ¹⁴ Additional studies, reports, and investigations would assist the management of the preserve's archeological resources. Among these, an archeological overview and assessment would describe and evaluate the preserve's known and potential archeological resources, identify the need for additional field surveys, and recommend future research. Based on recommendations from the overview and assessment, additional reconnaissance surveys would be carried out to more systematically identify sites and assist site probability assessments throughout the preserve. Selected sites, including those identified by previous surveys, may merit more intensive investigations (e.g., subsurface testing, remote sensing analysis) to assist determinations of site integrity, condition, and national register eligibility.
Parkwide	Jurisdictional compendium for oil and gas pipelines	L	These data are needed to clearly understand jurisdictional issues prior to or in the event of a spill, and to protect preserve resources.
Visitor experience	Census information to answer questions such as "how many people are we reaching?" and "what low-income and minority populations can we better serve nearby?"	L	Census data are needed for planning purposes and directing interpretative and educational programs for visitor understanding of the preserve and its resources.
Biodiversity	Corridor assessment	L	This assessment would help the preserve understand the efficacy of the corridors for population connectivity.
Biodiversity	Summarized weather history and weather outlook report for planning purposes	L	These data would help inform climate change management and other resources management related plans.

14. M. H. MacRoberts, and B. R. MacRoberts (2008). "The Big Thicket: Pristine Wilderness or Archeologically Understudied?" *Journal of the Botanical Research Institute of Texas*.

Part 3: Contributors

Big Thicket National Preserve

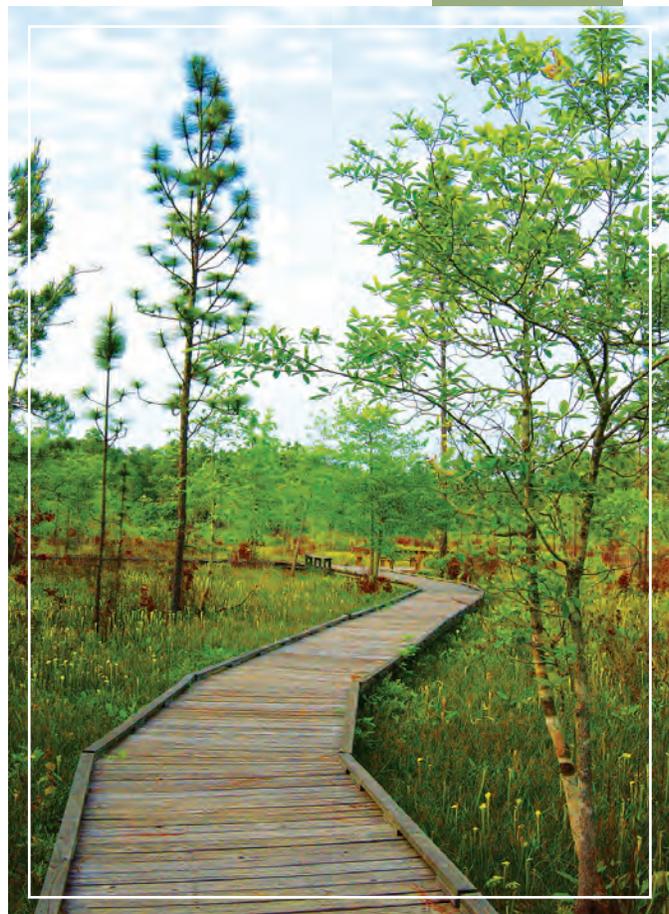
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Appendixes

Appendix A: Enabling Legislation and Legislative Acts for Big Thicket National Preserve

ENABLING LEGISLATION FOR
BIG THICKET NATIONAL PRESERVE
PUBLIC LAW 93-439,

As amended by: P. L. 94-578, P. L. 98-489, and P. L. 103-46

An Act to authorize the establishment of the Big Thicket National Preserve in the State of Texas, and for other purposes. (88 Stat. 1254) (PL 93-439)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that

(a) in order to assure the preservation, conservation, and protection of the natural, scenic, and recreational values of a significant portion of the Big Thicket area in the State of Texas and to provide for the enhancement and public enjoyment thereof, the Big Thicket National Preserve is hereby established.

(b) the Big Thicket National Preserve (hereafter referred to as the “preserve”) shall include the units generally depicted on the map numbered NBR-BT 91,027 which shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior, Washington, District of Columbia, and shall be filed with appropriate offices of Tyler, Hardin, Jasper, Polk, Liberty, Jefferson, and Orange Counties in the State of Texas. The Secretary of the Interior (hereinafter referred to as the “Secretary”) shall, as soon as practicable, but no later than six months after the date of enactment of this Act, publish a detailed description of the boundaries of the preserve in the Federal Register. In establishing such boundaries, the Secretary shall locate stream corridor unit boundaries referenced from the stream bank on each side thereof and he shall further make every reasonable effort to exclude from the units hereafter described any improved year-round residential properties which he determines, in his discretion, are not necessary for the protection of the values of the area or for its proper administration. The preserve shall consist of the following units:

Big Sandy Creek unit, Polk County, Texas, comprising approximately fourteen thousand three hundred acres;

Menard Creek corridor unit, Polk, Hardin, and Liberty Counties, Texas, including a module at its confluence with the Trinity River, comprising approximately three thousand three hundred and fifty-nine acres;

Hickory Creek Savannah unit, Tyler County, Texas, comprising approximately six hundred and sixty-eight acres;

Turkey Creek unit, Tyler and Hardin Counties, Texas, comprising approximately seven thousand eight hundred acres;

Beech Creek unit, Tyler County, Texas, comprising approximately four thousand eight hundred and fifty-six acres;

Upper Neches River corridor unit, Jasper, Tyler, and Hardin Counties, Texas, including the Sally Withers Addition, comprising approximately three thousand seven hundred and seventy-five acres;

Neches Bottom and Jack Gore Baygall unit, Hardin and Jasper Counties, Texas, comprising approximately thirteen thousand three hundred acres;

Lower Neches River corridor unit, Hardin, Jasper, and Orange Counties, Texas, except for a one-mile segment on the east side of the river including the site of the papermill near Evadale, comprising approximately two thousand six hundred acres;

Beaumont unit, Orange, Hardin, and Jefferson Counties, Texas, comprising approximately six thousand two hundred and eighteen acres;

Loblolly unit, Liberty County, Texas, comprising approximately five hundred and fifty acres;

Little Pine Island-Pine Island Bayou corridor unit, Hardin and Jefferson Counties, Texas, comprising approximately two thousand one hundred acres;

Lance Rosier unit, Hardin County, Texas, comprising approximately twenty-five thousand and twenty-four acres;

(c) The Secretary is authorized to acquire by donation, purchase with donated or appropriated funds, transfer from any other Federal agency, or exchange, any lands, waters, or interests therein which are located within the boundaries of the preserve: *Provided*, That any lands owned or acquired by the State of Texas, or any of its political subdivisions, may be acquired by donation only. After notifying the Committees on Interior and Insular Affairs of the United States Congress, in writing, of his intention to do so and of the reasons therefor, the Secretary may, if he finds that such lands would make a significant contribution to the purposes for which the preserve was created, accept title to any lands, or interests in lands, located outside of the boundaries of the preserve which the State of Texas or its political subdivisions may acquire and offer to donate to the United States or which any private person, organization, or public or private corporation may offer to donate to the United States and he may administer such lands as a part of the preserve after publishing notice to that effect in the Federal Register. Notwithstanding any other provision of law, any federally owned lands within the preserve shall, with the concurrence of the head of the administering agency, be transferred to the administrative jurisdiction of the Secretary for the purposes of this

Act without transfer of funds.

Sec. 2. (a) The Secretary shall, immediately after the publication of the boundaries of the preserve, commence negotiations for the acquisition of the lands located therein: *Provided*, That he shall not acquire the mineral estate in any property or existing easements for public utilities, pipelines or railroads without the consent of the owner unless, in his judgment, he first determines that such property or estate is subject to, or threatened with, uses which are, or would be, detrimental to the purposes and objectives of this Act: *Provided further*, That the Secretary, insofar as is reasonably possible, may avoid the acquisition of improved properties, as defined in this Act, and shall make every effort to minimize the acquisition of land where he finds it necessary to acquire properties containing improvements.

(b) Within one year after the date of the enactment of this Act, the Secretary shall submit, in writing, to the Committee on Interior and Insular Affairs and to the Committees on Appropriations of the United States Congress a detailed plan which shall indicate:

- (i) the lands and areas which he deems essential to the protection and public enjoyment of this preserve,
- (ii) the lands which he has previously acquired by purchase, donation, exchange or transfer for administration for the purpose of this preserve, and
- (iii) the annual acquisition program (including the level of funding) which he recommends for the ensuing five fiscal years.

(c) It is the express intent of the Congress that the Secretary should substantially complete the land acquisition program contemplated by this Act within six years after the date its enactment.

Sec. 3. (a) The owner of an improved property on the date of its acquisition by the Secretary may, as a condition of such acquisition, retain for himself and his heirs and assigns a right of use and occupancy of the improved property for noncommercial residential purposes for a definite term of not more than twenty-five years or, in lieu thereof, for a term ending at the death of the owner or the death of his spouse, whichever is later. The owner shall elect the term to be reserved. Unless this property is wholly or partially donated to the United States, the Secretary shall pay the owner the fair market value of the property on the date of acquisition less the fair market value, on that date, of the right retained by the owner. A right retained pursuant to this Section shall be subject to termination by the Secretary upon his determination that it is being exercised in a manner inconsistent with the purposes of this Act, and it shall terminate by operation of law upon the Secretary's notifying the holder of the right of such determination and tendering to him an amount equal to the fair market value of that portion of the right which remains unexpired.

(b) As used in this Act, the term "improved property" means a detached, one family dwelling, construction of which was begun before July 1, 1973, which is used for noncommercial residential purposes, together with not to exceed three acres of land on, which the dwelling is situated and together with such additional lands or interests therein as the Secretary deems to be reasonably necessary for access thereto, such lands being in the same ownership as the dwelling, together with any structures accessory to the dwelling which are situated on such land.

(c) Whenever an owner of property elects to retain a right of use and occupancy as provided in this section, such owner shall be deemed to have waived any benefits or rights accruing under sections 203, 204, 205, and 206 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (84 Statute [Stat.] 1894), and for the purposes of such sections such owner shall not be considered a displaced person as defined in section 101(6) of such Act.

Sec. 4.(a) The area within the boundaries depicted on the map referred to in section 1 shall be known as the Big Thicket National Preserve. Such lands shall be administered by the Secretary as a unit of the National Park System in a manner which will assure their natural and ecological integrity in perpetuity in accordance with the provisions of this Act and with the provisions of the Act of August 25, 1916 (39 Stat. 535; 16 USC 1-4), as amended and supplemented.

(b) In the interest of maintaining the ecological integrity of the preserve, the Secretary shall limit the construction of roads, vehicular campgrounds, employee housing, and other public use and administrative facilities and he shall promulgate and publish such rules and regulations in the Federal Register as he deems necessary and appropriate to limit and control the use of, and activities on, Federal lands and waters with respect to:

- (1) motorized land and water vehicles;
- (2) exploration for, and extraction of, oil, gas, and other minerals;
- (3) new construction of any kind;
- (4) grazing and agriculture; and

(5) such other uses as the Secretary determines must be limited or controlled in order to carry out the purposes of this Act.

(c) The Secretary shall permit hunting, fishing, and trapping on lands and waters under his jurisdiction within the preserve in accordance with the applicable laws of the United States and the State of Texas, except that he may designate zones where and periods when, no hunting, fishing, trapping or entry may be permitted for reasons of public safety, administration, floral and faunal protection and management, or public use and enjoyment. Except in emergencies, any regulations prescribing such restrictions relating to hunting, fishing, or trapping shall be put into effect only after consultation with the appropriate State agency having jurisdiction over hunting, fishing, and trapping activities.

Sec. 5. Within five years from the date of enactment of this Act, the Secretary shall review the area within the preserve and shall report to the President, in accordance with section 3(c) and (d) of the Wilderness Act (78 Stat. 891; 16 USC 1132 [c] and [d]), his recommendations as to the suitability or unsuitability of any area within the preserve for preservation as wilderness, and any designation of any such areas as a wilderness shall be accomplished in accordance with said subsections of the Wilderness Act.

Sec. 6. There are authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act, but not to exceed \$63,812,000 for the acquisition of lands and interests in lands and not to exceed 7,000,000 for development.

Approved October 11, 1974.

PUBLIC LAW 94-578

An Act to provide for increases in appropriation ceilings and boundary changes in certain units of the National Park System, and for other purposes. (90 Stat. 2732)

Be it enacted by the Senate and House of Representatives of the United States of American in Congress assembled,

TITLE III-MISCELLANEOUS PROVISIONS BIG THICKET NATIONAL PRESERVE

SEC. 322. Section 3(b) of the Act of October 11, 1974 (88 Stat. 1254); 16 USC 698[b]), is amended by deleting “detached, one-family dwelling,” and inserting in lieu thereof “detached, year-round one-family dwelling which serves as the owner’s permanent place of abode at the time of acquisition.”

Approved October 21, 1976.

PUBLIC LAW 98-489

An Act to provide for the acquisition of a visitor contact and administrative site for the Big Thicket National Preserve in the State of Texas. (98 Stat. 2267)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) subsection (c) of the first section of the Act entitled “An Act to authorize the establishment of the Big Thicket National Preserve in the State of Texas, and for other purposes”, approved October 11, 1974 (16 USC 698), is amended by inserting after the first sentence the following new sentence: “The Secretary may also acquire, by any of the above methods, approximately 15 acres of land outside of the boundaries of the preserve in the vicinity of the intersection of United States Highway 69 and State Farm-Market Road 420, in Hardin County, Texas, for purposes of a visitor contact and administrative site.”

(b) Section 6 of such Act is amended by inserting at the end thereof the following new sentence: “Effective October 1, 1984, there is authorized to be appropriated such sums as may be necessary for the acquisition of the visitor contact and administrative site referred to in subsection (c) of the first section of this Act.”

Approved October 17, 1984.

PUBLIC LAW 103-46

JULY 1, 1993

An Act to increase the size of the Big Thicket National Preserve in the State of Texas by adding the Village Creek corridor unit, the Big Sandy corridor unit, and the Canyonlands unit. (107 Stat. 229)

Be it enacted by the Senate and House Representatives the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be referred to as the “Big Thicket National Preserve Addition Act of 1993.”

SEC. 2. ADDITIONS TO THE BIG THICKET NATIONAL PRESERVE.

ADDITIONS.-Subsection (b) of the first section of the Act entitled “An Act to authorize the establishment of the Big Thicket National Preserve in the State of Texas, and for other purposes,” approved October 11, 1974 (16 USC 698), hereafter referred to as the “Act,” is amended as follows:

(1) Strike out “map entitled ‘Big Thicket National Preserve’” and all that follows through “Secretary of the Interior (hereafter referred to as the Secretary)” and insert in lieu thereof “map entitled ‘Big Thicket National Preserve’, dated October 1992, and numbered 175-0008, which shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior, and the offices of the Superintendent of the preserve.” After advising the Committee on Energy and Natural Resources of the United States Senate and the Committee on Natural Resources of the United States House of Representatives, in writing, the Secretary of the Interior (hereafter referred to as the “Secretary”) may make minor revisions of the boundaries of the preserve when necessary by publication of a revised drawing or other boundary description in the Federal Register. “The Secretary.”

(2) Strike out “and” at the end of the penultimate undesignated paragraph relating to Little Pine Island-Pine Island Bayou corridor unit.

(3) Strike out the period in the ultimate undesignated paragraph relating to Lance Rosier unit and insert in lieu thereof.

(4) Add at the end thereof the following:

“Village Creek Corridor unit, Hardin County, Texas, comprising approximately four thousand seven hundred and ninety-three acres;

“Big Sandy Corridor unit, Hardin, Polk, and Tyler Counties, Texas, comprising approximately four thousand four hundred and ninety-seven acres; and

“Canyonlands unit, Tyler County, Texas, comprising approximately one thousand four hundred and seventy-six acres.”

(b) ACQUISITION. (1) Subsection (c) of the first section of such Act is amended by striking out the first sentence and inserting in lieu thereof the following: “The Secretary is authorized to acquire by donation, purchase with donated or appropriated funds, transfer from any other Federal agency, or exchange, any lands, waters, or interests therein which are located within the boundaries of the preserve: *Provided*, That privately owned lands located within the Village Creek Corridor, Big Sandy Corridor, and Canyonlands units may be acquired only with the consent of the owner: *Provided further*, That the Secretary may acquire lands owned by commercial timber companies only by donation or exchange: *Provided further*, That any lands owned by the State of Texas, or any political subdivisions thereof may be acquired by donation only.”

(2) Add at the end of the first section of such Act the following new subsections:

“(d) Within sixty days after the date of enactment of this subsection, the Secretary and the Secretary of Agriculture shall identify lands within their jurisdiction located within the vicinity of the preserve which may be suitable for exchange for commercial timber lands within the preserve. In so doing, the Secretary of Agriculture shall seek to identify for exchange National Forest lands that are near or adjacent to private lands that are already owned by the commercial timber companies. Such National Forest lands shall be located in the Sabine National Forest in Sabine County, Texas, in the Davy Crockett National Forest south of Texas State Highway 7, or in other sites deemed mutually agreeable, and within reasonable distance of the timber companies’ existing mills. In exercising this exchange authority, the Secretary and the Secretary of Agriculture may utilize any authorities or procedures otherwise available to them in connection with land exchanges, and which are not inconsistent with the purposes of this Act. Land exchanges authorized pursuant to this subsection shall be of equal value and shall be completed as soon as possible, but no later than two years after date of enactment of this subsection.

“(e) With respect to the thirty-seven-acre area owned by the Louisiana-Pacific Corporation or its subsidiary, Kirby Forest Industries, Inc., on Big Sandy Creek in Hardin County, Texas, and now utilized as part of the Indian Springs Youth Camp (H.G. King Abstract 822), the Secretary shall not acquire such area without the consent of the owner so long as the area is used exclusively as a youth camp.”

(c) PUBLICATION OF BOUNDARY DESCRIPTION. Not later than six months after the date of enactment of this subsection, the Secretary shall publish in the Federal Register a detailed description of the boundary of the Village Creek Corridor unit, the Big Sandy Corridor unit, and the Canyonlands unit of the Big Thicket National Preserve.

(d) AUTHORIZATION OF APPROPRIATIONS. Section 6 of such Act is amended by adding at the end thereof the following new sentence: “Effective upon date of enactment of this sentence, there is authorized to be appropriated such sums as may be necessary to carry out the purposes of subsections (c) and (d) of the first section.”

Approved July 1, 1993.

Appendix B: Inventory of Administrative Commitments

Name	Agreement Type	Start Date	Expiration Date	Stakeholders	Purpose
Visitor center bookstore administration	Cooperating association agreement	2/24/2011	2/24/2016	Big Thicket NP, Western National Parks Association	A cooperating agreement to manage and stock the park bookstore and gift shop. Preserve provides space and staffing for this nonprofit cooperating association's bookstore.
General agreement for concurrent law enforcement	General agreement	4/29/2007	4/29/2012, currently updating agreement	Big Thicket NP, Hardin County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General agreement for concurrent law enforcement	General agreement	4/29/2007	4/29/2012, currently updating agreement	Big Thicket NP, Jasper County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General agreement for concurrent law enforcement	General agreement	4/29/2007	4/29/2012, currently updating agreement	Big Thicket NP, Jefferson County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General agreement for concurrent law enforcement	General agreement	4/29/2007	4/29/2012, currently updating agreement	Big Thicket NP, Liberty County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General agreement for concurrent law enforcement	General agreement	4/14/2008	4/14/2013, currently updating agreement	Big Thicket NP, Orange County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General agreement for concurrent law enforcement	General agreement	4/29/2007	4/29/2012, currently updating agreement	Big Thicket NP, Polk County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General agreement for concurrent law enforcement	General agreement	4/29/2007	4/29/2012, currently updating agreement	Big Thicket NP, Tyler County Sheriff's Office	Provide mutual law enforcement assistance in and near Big Thicket National Preserve.
General Agreement between Big Thicket National Preserve and The Nature Conservancy	General agreement	3/12/2012	3/12/2017	Big Thicket NP, The Nature Conservancy	Cooperation in the restoration of native longleaf pine forests.
Develop freshwater flow recommendations to mitigate effects of climate change to estuarine habitats	Gulf Coast CESU task agreement	2/27/2011	9/30/2013	Big Thicket NP, Texas A&M University	Develop freshwater flow recommendations to mitigate effects of climate change to estuarine habitats.

Name	Agreement Type	Start Date	Expiration Date	Stakeholders	Purpose
Big Thicket Association	Cooperative agreement	3/28/2011	3/28/2016	Big Thicket NP, Big Thicket Association	To implement the NPS Park Partnership Project's Thicket of Diversity ATBI.
Big Thicket Association	General agreement	6/30/2008	6/30/2013, currently updating agreement	Big Thicket NP, Big Thicket Association	Identifies roles and responsibilities for a Big Thicket Association and associated field research station.
Town Bluff Project / B.A. Steinhagen Lake, U.S. Army Corps of Engineers	General agreement	8/4/2010	Shall remain in effect until modified or terminated by either party.	Big Thicket NP, U.S. Army Corps of Engineers, Ft. Worth District, Town Bluff Project	To establish a cooperative effort to remove invasive plants and facilitate restoration.
Big Thicket National Preserve / Texas Forest Service Mutual Aid Agreement	Memorandum of understanding	6/8/2010	6/8/2015	Big Thicket NP, Texas Forest Service	Mutual aid cooperation for wildland fire and emergency management. Includes utilization of Texas Forest Service owned bulldozer and transport.
Texas Cooperative Wildland Fire Management and Stafford Act Response Agreement	Cooperative agreement	6/30/2010	6/30/2015	U.S. Forest Service, Region 8; U.S. Fish and Wildlife Service, Southwest Region; National Park Service, Intermountain Region; Bureau of Indian Affairs, Southern Plains Region; Texas Parks and Wildlife Department; Texas Forest Service	Cooperative response for wildland fire and emergency management. Regional statewide agreement. NPS Agreement # F1249100008.
U.S. Fish and Wildlife Service / National Park Service / The Nature Conservancy Wildland Fire Management Agreement	Memorandum of understanding	10/30/2009	10/30/2014	US Fish and Wildlife Service, Southwest Region; National Park Service, Intermountain Region; The Nature Conservancy, Texas Chapter	Cooperative wildland fire management. NPS Agreement # 1249100002.

Name	Agreement Type	Start Date	Expiration Date	Stakeholders	Purpose
NPS Wildland Fire Management - Southeast Texas Group	Interpark agreement	4/10/2007	4/10/2012, currently updating agreement	Big Thicket NP; Lyndon B. Johnson National Historical Park; Padre Island National Seashore; San Antonio Missions National Historical Park	Wildland fire management responsibilities within NPS Southeast Texas group.
Big Thicket National Preserve / Saratoga Volunteer Fire Department Fire Management Agreement	Memorandum of understanding	8/10/2010	8/10/2015	Big Thicket NP; Saratoga Volunteer Fire Department	Wildland fire, structural fire, and search and rescue.
Big Thicket National Preserve / Warren Volunteer Fire Department Fire Management Agreement	Memorandum of understanding	8/9/2010	8/9/2015	Big Thicket NP; Warren Volunteer Fire Department	Wildland fire, structural fire, and search and rescue.
Big Thicket National Preserve / Wildwood Volunteer Fire Department Fire Management Agreement	Memorandum of understanding	8/10/2010	8/10/2015	Big Thicket NP, Wildwood Volunteer Fire Department	Wildland fire, structural fire, and search and rescue.



Appendix C: Wild and Scenic River Values

Excerpts from the Draft “Big Thicket National Preserve Eligibility Assessment Workshop Report”

Outstandingly remarkable values (ORVs), free-flowing condition, and water quality form the three pillars of protection under the Wild and Scenic Rivers Act. Free-flowing condition and water quality support the integrity of the ORVs and their protection is a key component of Wild and Scenic Rivers designation. Because of their importance to the overall protection and enhancement of a designated wild and scenic river, free-flow condition and water quality are included as part of this ORV statement. These fundamental characteristics of the river segments within Big Thicket National Preserve are described at the end of the ORV statement.

Outstandingly Remarkable Values

The first step in determining wild and scenic river eligibility is to ascertain whether the rivers contain outstandingly remarkable values. During the February 2012 workshop, criteria were used to draft a set of outstandingly remarkable value statements for the study segments in Big Thicket National Preserve. These criteria were developed using the Interagency Wild and Scenic Rivers Coordinating Council’s guidance for determining ORVs, which states:

- An ORV must be river related or dependent. This means that a value must be located in the river or on its immediate shorelands (generally within ¼ mile on either side of the river, also referred to as the river corridor); contribute substantially to the functioning of the river ecosystem; and/or owe its location or existence to the presence of the river.
- An ORV must be rare, unique, or exemplary at a comparative regional or national scale. Such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

So that their protection and enhancement can be assured, the National Park Service also determined that ORVs for the study segments in Big Thicket must be specifically evaluated and defined for the individual river segments.

The results of the workshop concluded that the Big Thicket study segments contain the following set of outstandingly remarkable values: scenic, recreational, cultural, ecological/wildlife, fish, and geologic. A set of broad statements has been developed that articulates each ORV for all the study segments within Big Thicket. An evaluation process based on a clearly defined set of criteria for each ORV was used to determine which river segments contain the different ORVs. The results from this evaluation were used to develop ORV sub-statements for those river segments, which provide evidence and support for the broader ORV statements. The following matrix summarizes the evaluation results and provides an organization to the ORV statements and sub-statements described below.



ORV Evaluation Matrix by River Segment

River Segment	ORV Category				
	Scenic	Recreational	Ecological/ Wildlife/Fish	Geologic	Cultural
Neches River (1) (Town Bluff Dam to the Hwy 96 Bridge)	●	●	●	●	
Neches River (2) (Hwy 96 Bridge to the Saltwater Barrier)	●	●	●		
Neches River (3) (Saltwater Barrier to I-10)					
Big Sandy Creek	●	●	●		
Turkey Creek	●	●	●		
Village Creek	●	●	●		
Pine Island Bayou/Little Pine Island Bayou	●		●		●
Menard Creek					

Scenic.

The biological diversity of the rivers and streams of Big Thicket National Preserve creates a canvas for unmatched scenic beauty and value. From the water, the visitor is able to experience a diversity of views not possible via other modes of travel. The deep water pools, blackwater swamps, and shallows rippling over snow white sandbars are unsurpassed. The backdrop of colorful and diverse vegetation and array of wildlife around every bend and stretch of the rivers can capture one’s spirit for a lifetime.

The leisurely views from the river are grand, but a stop on a sandbar or taking a few steps from the bank, the microscopic vistas astound. Floating through the slow-meandering water, the reflection off the water creates a mysterious scene where one is unsure of what is up or down, only broken by the ripple of an alligator, the splash of a turtle, or the swoosh of a great blue heron.

Neches River (Town Bluff Dam to Hwy 96 Bridge).

From the Town Bluff Dam to the Highway 96 Bridge, the Neches River flows by scenic high sandstone and iron ore bluffs and numerous large snow-colored sandbars. A variety of vegetation types add the scenic quality of the river corridor. Large white barked sycamores, scaly barked river birches, sweetgums, and pines dominate the vegetative cover along the banks. Vistas are often limited to the river corridor due to the density of the screening vegetation. This section contains a moderate wildlife population.

Numerous shore and wading birds such as the great egret, cattle egret, and great blue heron can normally be seen. There are also abundant signs of numerous small mammals, but actual sightings are more common from late fall to early spring when dense vegetation is dormant. The tree and vine covered banks of the Neches and its slow moving currents provide a serene setting for canoeists.

The nature of the river changes as it courses its way through the Neches Bottom-Jack Gore Baygall Unit as indicated by the low marshy banks and relatively few sandbars. Jack Gore Baygall is probably the largest wooded acid bog in the world, birthed where water seeps from the base of ancient 50-foot high bluffs of the Neches River. Several scenic oxbow lakes and backwater cypress sloughs are located throughout this section, including Deep Slough that immerses the visitor into the primeval qualities of the bottomland forest. Franklin Lake, a cypress slough that twists its way from the ancient bluff line of the Neches River, is also located within this area. The remoteness of this segment also provides an excellent opportunity to observe starry night skies.

Neches River (Hwy 96 Bridge to Saltwater Barrier).

The Neches River, from the Highway 96 Bridge to the Saltwater Barrier, provides diverse scenic views. The meandering river through this segment creates numerous snowy-white sandbars that contrast the dense green forests that line the banks of the river during the summer. Seasonal variation in the color of the foliage allows visitors the opportunity to re-explore the scenic beauty of the river. At the confluence with Village Creek, the slow-moving, dark tea-colored waters of the Neches mix with the swifter, blue-colored water of the creek to create a unique visual contrast. One unusual scenic feature along this stretch of river is where a historic sunken barge has created a vegetated sandbar. Visually interesting cultural features along this stretch of river include mounds that may have been constructed by Native Americans and a sunken barge that has created a vegetated sandbar.

Neches River (Saltwater Barrier to I-10).

The scenic features of the Neches River below the saltwater barrier are more typical of the region's tidally influenced rivers and streams. There are no significant geologic formations and the plant communities are common. Because of this, this segment of the river was found not to contain outstandingly remarkable scenic values.

Village Creek (Confluence with Big Sandy to confluence with the Neches).

Village Creek is a dynamic, spring-fed system that provides visitors with an opportunity to see a blackwater stream swiftly moving through snow-white sandbars. The scenic beauty of this segment is further accentuated by the rich biodiversity of plant and animal life. As visitors float downstream, they can observe cactus on one side of the stream and orchids on the other surrounded by a beech-magnolia-loblolly pine forest. One can also catch a glimpse of fast-running roadrunners, which is unique to the region. After the McNeely Bridge, the creek flows by the Old Sternenberg Preserve. Its dominant feature is a high bluff hung with Christmas ferns that is framed by giant cypress trees at its base. Further downstream the creek passes through the Roy E. Larsen Sandyland Sanctuary where there are many extensive sandbars and the water is clear. Another dramatic scenic feature of this segment, found along the Kirby Nature Trail, includes a beautiful cypress slough that contains a remnant stand of cypress trees that may be more than 500 years old.

Big Sandy Creek (From the preserve boundary at the northern portion of Big Sandy Unit to the confluence with Village Creek).

Big Sandy Creek exhibits similar scenic features to Village Creek with a dynamic streambed and a diversity of plants and animals. Due its narrower and shallower channel and many fallen trees, this segment is more challenging for visitors to observe its unique scenery. The remoteness of this segment also provides an excellent opportunity to observe starry night skies.

Turkey Creek (From the preserve boundary at the northern portion of Turkey Creek Unit to the confluence with Village Creek).

Turkey Creek reveals similar scenic features as Village and Big Sandy Creeks with its dynamic stream channel, numerous sandbars, and rich biodiversity. Two outstanding features include a scenic bog inhabited by meat-eating pitcher plants and sundews and a large sand hill that represents a desert-like environment that is rare to the region.

Menard Creek (From the preserve boundary in the Big Sandy Unit to the confluence with the Trinity River).

Although Menard Creek has many of the same attributes as Village, Big Sandy, and Turkey Creeks, it was not found to contain outstandingly remarkable scenic values. This because it is not navigable for the most part and the corridor is quite narrow.

Pine Island Bayou/Little Pine Island Bayou (From the preserve boundary in the Lance Rosier Unit to the confluence with the Neches).

Little Pine Island Bayou, upstream from Highway 326, contains a Palmetto Flatwoods plant community that is traditionally known at the heart of the “Big Thicket” due to the mysterious nature of this waterway. The hardwood overstory shades endless thickets of palmetto palms. Tea-colored sloughs stretch back into dense growth, disappearing among the palmettos. Interspersed among moss-covered hardwoods are stands of cypress. Even today it is considered remote and strange, and the endless variety of scenery can be hypnotic to visitors.

Recreation.

The Big Thicket National Preserve WSR eligibility study area is a year-round mecca for recreationists, nature-lovers, and those seeking an unparalleled experience in the wild. The world-class biodiversity of this area provides a unique setting for an array of recreational opportunities that are unparalleled. Such opportunities are open and accessible by the public in a location where such access is rare. The study area is nestled in a rural, yet populated environment perched on the doorstep of Houston, one of the nation’s largest metropolitan areas. In an ever urbanizing world, it serves as the recreational heart of the region and provides reprieve, isolation and peaceful solitude from modern life, a wilderness-like experience.

Along the banks and a few feet into the thicket, one can get lost in the subtle beauty, which changes around every bend and stretch of the rivers and creeks. The changing seasons surprise the visitor with an extraordinary array of color, feel, sound, and movement of the water. Whether here for a moment, a day, or a lifetime, one can never experience it all. The abundance of recreational opportunities connects people from all backgrounds and ages to the waterways. It is a world-class learning laboratory that offers water-based research, educational, and interpretation opportunities, a rarity in the region. It is a place of wonder, adventure, and challenge, a wild jewel in an ever-changing world.

Uniqueness is due to the contiguous nature and the fact that you can get out and experience the creek from the land due to the public access of the creek.

Big Sandy Creek.

This segment of the study area gives recreationists a chance to get lost in the wilds of the thicket. Its uniqueness is driven by the challenge and adventure that presents itself due to the dense, thick vegetation, abundant and sometimes poisonous wildlife, and quicksand, which can leave a visitor face-to-face with nature in its pure, wild state. This stretch is almost impossible to navigate with a motorized vessel, thus it is a place for paddling challenge and adventure; it can inject fear into those not comfortable maneuvering a boat through the downed logs, cypress knees, trees, and sand bars. This place is easy to get turned around in and lose your bearings. Some visitors may even choose to not bring a boat, but rather wade through the channel for ease and efficiency of travel. Traveling down the creek requires frequent portaging and skilled maneuvering. Obstacles exist around every turn as the vegetation canopy shrinks in around you. Within the Big Sandy Unit, visitors are very isolated and there is little to no sign of human intrusion. The continuity of the wild, challenging nature of this creek is unique to the region. The natural soundscape prevails and those staying overnight can experience dark night skies that are unique in the region. Below FM 1276, the wild nature lessens to some degree as FM943 winds its way within a quarter mile of the creek, but recreationists can still experience a level of wildness that is unique to the region.

Village Creek.

Village Creek provides unique recreational opportunities to experience the wild nature of the region. Being spring-fed, the tannin rich water is cool, providing reprieve from hot summer days. All along the upper stretch from Big Sandy Creek down to Beech Creek is narrow with thick vegetation on either side creating challenge or adventure for boaters. Boaters must portage and navigate over downed logs and around trees.

Those seeking a wild experience with more of a safety net can get that experience south of FM418. There are fewer obstacles in this stretch as the creek widens with additional stream inflows. One is more likely to see other people in this stretch as more access points exist, which allow for easily accessible day use opportunities.

From Village Creek State Park to the confluence, the creek is very navigable, but only for the adventurous; recreationists enter a whole new realm of solitude. For much of the year, motorized vessels are restricted from the channel due to shallow conditions and downed trees, enhancing the natural soundscape and isolated feel. There are few points to take out, which limits visitation and the sloughs and backwater make this stretch feel more swamp like. Backcountry camping is allowed on sandbars where visitors can enjoy a wild experience. In the upper segments the natural soundscape prevails and those staying overnight can experience dark night skies that are unique in the region.

Turkey Creek.

The outstandingly remarkable aspect of Turkey Creek is that visitors can navigate it without a boat. The 17 mile trail along Turkey Creek provides visitors with an exceptional opportunity to experience the biological crossroads of North America along the water's banks. Around every turn, constant surprises await. From north to south and east to west, the trail meanders through the four major continental biological influences (southwest deserts, central plains, eastern forests, and southeastern swamps) that collide to form the unique ecotone of the region. Recreationists can hike, walk and trail run along the creek, which is the longest linear trail along a waterway within the region. It is a purely natural trail that is not improved, except for area where it crosses a slough or baygall. Due to its length, this area is frequently used for backcountry, overnight adventures. The trail provides visitors the opportunity to experience the wild nature of the stream, yet with a clear, safe path back to civilization.

Neches 1 and 2 Substatement.

This segment of the study area is uniquely wild due to the big channel, commanding vistas, and views of spectacular wildlife that are not possible in more intimate waterways. The water-based recreational opportunities are uninterrupted. One could spend weeks to get from the northern end to the salt water barrier, camping along the big sand bars, sometimes three-quarters of a mile long.

The sheer distance of this stretch coupled with the bigger channel, requires non-motorized users to spend time and energy to travel between the limited access points. The minimal human development in this area enhances the isolation, making one feel miniscule in relation to the size of the river and the impenetrable, dense vegetation on either bank. The length of the river and the isolation of the area also demands that visitors have some level of self-reliance and be prepared for the worst. A night in the wildness of the thicket without proper supplies would be an experience not easily forgotten.

In certain sections, the length of the view up or downstream is unparalleled. The lack of a canopy above allows for spectacular sights of the variety of birds traveling along the flyways. Uninterrupted by the sound or sight of human activity day or night enhances the wildness that visitors experience. The natural soundscape coupled with dark night skies makes backcountry, overnight expeditions a unique experience in the region.

Dismissal for Menard Creek and Pine Island Bayou and Little Pine Island Bayou and Neches 3.

The lack of rare, unique, or exemplary recreational opportunities for these three waterways led to the determination that outstandingly remarkable recreation values do not exist within these segments. Although they provide some opportunities for a wild experience, the level of development, including ranching and farming activity, subdivisions, and communities, as well as more motorized boaters decreases the wildness, isolation, and challenge present in other segments. The proximity to populated areas and road systems further detract from the recreational value of these segments.

Ecological/Fish/Wildlife.

The Big Thicket WSR eligibility study area is a major ecological convergence zone harboring one of the most biologically diverse ecosystems in North America. These ecotonal interactions support unique community assemblages, which are dependent on the intermingling of the big river, small stream, and low gradient/bayou systems. Within the region, the Big Thicket WSR study area provides important habitat connectivity in a highly fragmented landscape. Natural disturbances such as hurricanes, floods, fires, tornadoes, and fluvial geomorphological processes result in exemplary habitat diversity. This is the largest protected river system in the Big Thicket ecoregion, an area approximately 3.5 million acres in size between the Trinity and Sabine Rivers. This protection ensures this dynamic web of habitat remains largely intact.

Vegetation.

The entire Big Thicket ecoregion, with exception of some isolated patches, has been logged at least once. However, the preserve still maintains regionally significant tracts of beech-magnolia, floodplain forests, native river cane, palmetto flatwoods, and coastal and inland tracts of cypress. The diverse soils, supported by the river system, promote numerous vegetative communities, many of which harbor rare species such as Texas trailing phlox, scarlet catchfly, and Winkler's gallardia. Subtle changes in topography also influence plant communities, producing unique wetland networks that link acid bogs, baygalls, cypress sloughs, and beech-magnolia hummocks to neighboring waterways.

Wildlife.

The Big Thicket WSR study area is home to a variety of mammal species that rely on the riparian areas for foraging and habitat needs. Common mammals include cougar, coyotes, bobcats, opossums, mink, armadillo, and river otters. The area is also home to 51 reptiles and amphibians, including rare canebrake rattlesnakes.

On major migration routes, visitors can see many different species of birds. The Neches River is one place that visitors might see Bald Eagles. Other rare species include the swallow-tailed kite, woodstorks, and roseate spoonbills.

Fish/Mussels.

The Big Thicket WSR eligibility study area supports 70 known native fish species of which 2 are listed a species of special concern. Notable species of concern include suckers, catfish, minnows, shiners, and darters. The presence of marine transient species, such as needlefish, hogchoker, and striped mullet, moving upriver is unique to unimpounded Gulf Coastal river systems. Some fish species are critical hosts in the reproductive life cycle of mussels, many of which are species-specific. Currently, there are 12 state-listed species of freshwater mussels in Texas, five of which occur within the Big Thicket WSR study area. Three of these species (the triangle pigtoe, Louisiana pigtoe, and Texas heelsplitter) are currently under federal review for proposed listing as threatened or endangered.

Threats.

The presence and proliferation of nonnative species such as Chinese tallow, Japanese climbing fern and kudzu, is a threat to the native vegetation diversity. Salvinia, giant duckweed, and water hyacinth threaten the sloughs and ponds along the river. Feral hogs, Asian clams, common carp, grass carp, redbreast sunfish – while nonnative, are currently not causing problems. There is also the potential for zebra mussel invasion.

Neches River (Town Bluff Dam to Hwy 96 Bridge).

The dynamic nature of this river segment and its interactions with the floodplain has created a mosaic of habitat types that promote high biodiversity in the terrestrial landscape. These habitat types support regionally significant rare vegetation communities such as beech-magnolia, cypress, fern cliff/bluff communities, and some of the highest quality Louisiana black bear habitat. The free-flowing characteristics of this segment also creates optimal mussel habitat that drives unparalleled mussel diversity and promotes rare species. For example, the threatened/endangered sandbank pocketbook and Texas heelsplitter are commonly found in this river segment.

Neches River (Hwy 96 Bridge to Saltwater Barrier).

Being a downstream segment of the Neches River, in-stream structure, created by downed trees that originate from upstream, plays a critical role in driving unique ecology of this segment. For example, hydrology is altered because of this in-stream structure, which creates an array of habitats that benefit the mussel community. Therefore, mussel richness is high in this segment and the rare and endangered species found upstream are also present here. The low lying characteristics of this downstream segment creates bog habitat that supports a variety of specialized fern species.

Village Creek (Confluence with Big Sandy to Confluence with the Neches).

The exemplary aquatic conditions, unimpeded flow, and diverse habitat types in this river segment helps support a rich and productive community of freshwater mussels. These populations are probably vital to the overall mussel richness in the Neches River system by providing a brood stock. For example, in the shallows of the exposed sand beaches you can find an abundance of yellow sandshell and fragile papershells. In the backwater eddies common mussel inhabitants include threeridge, pistolgrip, southern mapleleaf, and Louisiana fatmucket.

Big Sandy Creek (From the preserve boundary at the northern portion of Big Sandy Unit to the confluence with Village Creek).

Big Sandy Creek displays a more deeply dissected and highly elevated topography, allowing for more well-established drainage patterns and wide floodplain. The notable biological diversity in this segment is the result of the varied topography, stream type, and mosaic of acidic and calcareous soils. These moist and nutrient-laden soils in the segment promote the existence of exemplary characteristic baygalls, cypress sloughs, seep communities, and floodplain forests. Small stream tributaries flow through the rare and unique beech-magnolia hummocks. These vegetation communities provide important habitat for river otters, cougars, beavers, pitcher plants, alligators, bald eagles, big eared bats, and diverse fish communities.

Turkey Creek (From the preserve boundary at the northern portion of Turkey Creek Unit to the confluence with Village Creek).

The moist and nutrient laden soils in the segment promote the existence of baygalls, cypress sloughs, pitcher plant bogs, and floodplain forests including the rare and unique beech-magnolia hummocks. Large alluvial deposits in this southern portion of the segment create ideal sandhill habitat for the fire-dependent and endangered Texas trailing phlox, the rare scarlet catchfly and Winkler's gaillardia. The riparian area within the Turkey Creek corridor also provides high quality habitat for the endangered Louisiana black bear, cougars, as well as for river otters, and resident and migratory birds.

Pine Island Bayou / Little Pine Island Bayou (From the preserve boundary in the Lance Rosier Unit to the confluence with the Neches).

The section of Little Pine Island Bayou within the Lance Rosier Unit meanders naturally through bottomland hardwood forests covered with a mysterious and dense palmetto understory. This exemplary reach of native riparian habitat has been left in a wild condition that maintains a highly diverse web of aquatic and terrestrial interactions. This stretch of unimpeded, natural waterway is an ideal habitat for foraging, denning, and grubbing by the endangered Louisiana black bear. The intricate networks of sloughs, bogs, and bayous support a thriving relationship between fungi, amphibians, reptiles and various flora. Comparatively, the Little Pine Island/Pine Island Bayou Corridor Unit has been impacted heavily by development from communities along the waterway. Pollutants, vegetation removal, and debris have detracted from the natural conditions of the once remote ecosystem. For these reasons, the corridor unit is not considered to contain an outstandingly remarkable ecological value.

Neches River (Saltwater Barrier to I-10).

This river segment was not assigned an Ecological ORV due to the absence of resources that are rare, unique, or exemplary to the region. Although there is an occurrence of coastal swamp and floating marsh habitat and related diversity of species, these areas are heavily exposed to urban industry and development as well as activities that disrupt free-flow conditions such as downstream dredging, upstream operations of the saltwater barrier, and industrial effluent in excess of 65 million gallons a day. This area is currently transitioning into a saltmarsh, due to saltwater inundation from human-caused and natural disturbances.

Menard Creek (From the preserve boundary in the Big Sandy Unit to the confluence with the Trinity River).

The riparian zone surrounding Menard Creek remains a last remnant of a once flourishing ecosystem within the westernmost portion of the Preserve. From a floristic point of view, the eroding streambed into calcareous materials provides rare habitat for a significant variety of plants not found in other comparably acidic areas. However, groundtruthing by staff to find reported calcareous sediments was unsuccessful largely due to heavy vegetation. For this reason, it was not found to support outstanding remarkable values.

Geologic.

Big Thicket provides a rare opportunity to view exposed geologic layers that are not typical of the region's low-lying Gulf Coastal Plain physiographic province. Most of the preserve is heavily vegetated and exposures of the underlying geology and associated paleontological resources are likely to be found in only river and stream cut banks, gullies, and other erosional features. These formations provide educational opportunities for the public to view and study paleontological specimens, including mammoth, mastodon, rhinoceros, and other ice age megafauna. These and other fossils have been identified in all strata throughout the preserve. In particular, the Willis, Bentley, and Montgomery formations are known to preserve these ancient species. Petrified wood also exists, providing clues about past climatic changes. The Canyonlands Unit on the upper Neches River is an exemplary formation in the region that contains the highest concentration of paleontological resources.

In addition to these unique geologic and paleontological resources, Big Thicket drainage system includes a number of lowland, meandering streams, fluvial floodplains, old meander bends, oxbow lakes, and bayous. Although these landforms are more typical of the region, they provide the basis for the rich biodiversity of the preserve.

Neches River (Town Bluff Dam to Hwy 96 Bridge).

In the upper portion of this segment, the Neches River meanders through the Canyonlands Unit along eroding steep bluffs and gentle sloping clay and sand beds. Erosion along the banks of the river is due to stream channel migration. These geologic features predominately expose the Willis, Bentley, and Montgomery formations that preserve a host of paleontological fossils, including mammoth, mastodon, ancestral horse, giant ground sloths, turtles, and saber-tooth cats and other ice-age megafauna. The age of these formations date back 3 million years ago to the Pleistocene. In addition, even older rhinoceros fossils from the Miocene (25 million years ago) have been found in this area. There is also a potential for finding large pieces of petrified wood in this portion of the segment.

All other River Segments.

All other river segments were found not to contain outstandingly remarkable geologic values. This is due to the fact that these segments course through the region's low-lying Gulf Coastal Plain that is highly vegetated. As a result, they do not contain exposed cliffs or other distinctive geologic features. Although they record a sequence of fluvial deposits, they do not possess unique or exemplary qualities.

Cultural.

The rivers and streams of Big Thicket National Preserve have a distinctive history in southeast Texas. The parade of cultures that have stepped through the centuries have used the waterways to support their survival. The river bottom in this area was the prime hunting ground of Native peoples, whose early use left evidence in the form of shell middens along the rivers' edge, and who used river bluffs as campsites.

The river was the lifeblood of early commerce; all goods that flowed into the region came by river. Geological niche points (ridges associated with the Fleming and Willis formations, extending to the river's edge) provided easy access to the river by horse or wagon. Numerous ferry crossings and steamboat landings utilized these niches along the Neches River.

In 1901 discoveries of oil at Spindletop, Sour Lake, and Saratoga initiated the national oil boom that caused a population explosion along the southern edge of the Thicket. This increased the demand for timber in the region for construction of infrastructure such as buildings, derricks, docks, telegraph poles, steamboats, and railroad ties. Wood was also used to fuel steam-powered engines in boats, locomotives, and cranes. A significant amount of the timber needed to supply this demand was rafted downstream along the Neches River to Voth Mill on Pine Island Bayou.

By the beginning of the 20th century, commerce shifted from the river to the railroad as timber companies constructed railroad arteries through the landscape. Riverboats were displaced by the railroad, and later road system, as the primary form of transportation. The cultural connection to the waterways was lost when they no longer served as conduits for transportation or major sources of food, however, they are now valued for their recreation and scenery.

Pine Island Bayou.

The lower portion of Pine Island Bayou from the confluence with the Neches River upstream to the vicinity of the Highway 96 crossing, was determined to satisfy cultural ORV criteria. Voth Mill, located near Highway 96, was a lumber mill that played a significant role in processing timber into products needed for the expanding regional oil industry, railroads, and development of Beaumont and other boomtowns in the region. This mill was both river-dependent (because the waterways were used to float timber to the mill and water was needed for the mill's steam-fired engines) and regionally unique.

All other segments.

There are many other river-related cultural resources, such as ferry crossings and steamboat landings along the Neches River, and Native American encampments throughout the Big Thicket waterways. However, these sites did not meet the cultural ORV criteria because we determined these resources were not rare, unique, or exemplary in the region of comparison.

Spanish explorers used a trace running through the Big Thicket from Liberty to Nacogdoches across Big Sandy Creek. Priest Creek, a tributary to Big Sandy, is purported to be the place where a priest, returning from a wedding, committed suicide. It is rumored that he was buried wearing his gold cross, which is still sought after.

Located between Spanish and French territories, the region known as Big Thicket (“the Thicket”) drew outlaws such as horse thieves and those avoiding conscription for the Civil War, as well as European settlers displaced from southern Appalachia and Alabama-Coushatta peoples displaced from SE Alabama and Mississippi. The Thicket provided food and shelter for these hardy folk in the mild climate of east Texas. Between 1819 and 1836, the boundary dispute between the United States and Mexico continued, with both nations claiming the area between the Neches and Sabine rivers.

Ferryboats have been exposed along the Neches River about one mile downstream of Sheffield’s ferry (now boat ramp).

By 1910 Land barons such as John Kirby and Arthur Temple exploited timber via railroad from Port Arthur to Rockland (Hwy 69), also bringing quarried rock south to the coast for a seawall.

The first structures across the region’s waterways were railroad trestles; bridges later replaced trestles at these locations. What once was a vast outlaw region between rivers was civilized, leaving the river bottom as the last place to live free from authority.

In the 1930s and 40s, a second timber boom, particularly for cypress, was attributed to shipbuilding for WWII. The construction of the Town Bluff Dam (“Dam B”), creating B.A. Steinhagen Lake in 1951 began the harnessing of the river.

Free-flowing Condition.

The Big Thicket National Preserve is composed of nine terrestrial units and six water corridors in a network that covers seven counties, a 3,500 mi²-area. The importance of free-flowing freshwater to the preserve cannot be overstated. Nearly every unit of the preserve contains or is directly adjacent to high-order perennial streams.

The Neches River and its floodplain are one of the primary features of Big Thicket National Preserve. The preserve manages more than 80 river miles of the Neches in a continuous reach from just below B.A Steinhagen Lake (Town Bluff Dam) to tidal reaches of the river at the Lower Neches Valley Authority (LNVA) saltwater barrier in Beaumont. The river connects three terrestrial units of the preserve; the Canyonlands Unit, the Jack Gore Baygall and Neches Bottom Unit, and the Beaumont Unit. The preserve manages several major tributaries to the Neches River, including large segments of Village Creek and Little Pine Island Bayou – Pine Island Bayou. Overall, the preserve manages more than 250 miles of freshwater rivers and streams within its boundary. While most of the preserve is in the Neches River basin, the preserve is also a steward of the Trinity River basin, and manages segments of Menard Creek to its confluence with the Trinity River near Romayor.

Much of the preserve is connected to, and dependent on, freshwater flow. The preserve landscape is rich in a variety of hydrologic features: floodplains, sloughs, oxbows, baygalls, acid bogs, and low-order tributary streams. Approximately 40% of the preserve is composed of palustrine, riverine, or lacustrine wetlands. The majority of the wetlands in the preserve are palustrine wetlands that are dominated by bottomland hardwood forest. These riparian forests are important because they reduce flooding, improve water quality, provide for groundwater recharge, and provide shade, structure, and resources that support the tremendous biological diversity of the region. The vegetation composition and community structure of the riparian forests, and the ecological services and human benefits that they provide, are dependent on environmental flows, including floodplain inundation

The preserve also manages portions of the Neches River estuary. New lands donated to the preserve in 2009 by The Conservation Fund include a 5,900-acre wetlands complex of cypress-tupelo swamp, bottomland hardwood forest, and freshwater marsh. This complex extends from below the saltwater barrier on the Neches River, south along the city limits of Beaumont, reaching Interstate 10. This wetland complex lies entirely within the Texas Coastal Management Zone and is influenced both by freshwater releases in the Neches River and saltwater intrusion and tides from Sabine Lake and the Gulf of Mexico. Overall, the preserve manages 8,250 acres in the Texas coastal zone. These lands are vulnerable to the effects of climate change that have been identified for coastal, riverine, and estuarine ecosystems, and are also subject to human-caused impacts from development and water use. Notably, the U.S. Army Corps of Engineers plan to deepen the navigational channel from the Gulf of Mexico to the Port of Beaumont from 40 to 48 feet will magnify the influence of tides and salinity on these new preserve wetlands.

Under Texas state law (Senate Bill 3), the Neches River flows are now managed under Chapter 298 Environmental Flow Standards for Surface Waters, Subchapter C. The Texas Commission on Environmental Quality oversees the implementation of a schedule of flow quantities that contain subsistence flow, base flow, and one level of high flow pulses at defined measurement points. Minimum flow levels will vary by season and by year since the amount of precipitation and, therefore, whether a system is in subsistence or base flow conditions, will vary from year to year and within a year from season to season, and the number of pulses protected will also vary with the amount of precipitation.

The Beaumont Unit below the saltwater barrier has experienced greater channelization than the upper portions of the Neches. As previously mentioned, the U.S. Army Corps of Engineers has and will continue to dredge the channel in order to keep the Port of Beaumont in operation. Other structural modifications in the area include straight “pin-wheel” type channels used historically for pulling timber out of the unit, and a conveyance system to discharge Evadale pulp plant effluent into the Neches River crosses the southeast portion of the unit. Industrial plants exist on the right bank of this unit and have hardened structures along the bank.

In summary, the two segments of the Neches River that exhibit free-flow conditions are from the Dam to 96 Bridge and 96 Bridge to the saltwater barrier. Below the saltwater barrier, exhibit qualities associated with a free-flow condition. The final segment from the saltwater barrier to has been more significantly altered by industry and channelization and does not represent free-flow conditions.

Water Quality.

Rivers, streams, creeks, and bayous lie at the heart of the preserve and are the unifying resource at Big Thicket National Preserve. Water quality is critical to many aquatic and terrestrial life forms, streamside communities, and visitors. The waterways of the preserve are home to a diversity of aquatic flora and fauna. Thus, a major aspect of managing the preserve is to protect the water quality of these waterways. One of the challenges is that the preserve represents only about 1.6 percent of the entire Neches River watershed. Surface water-quality concerns reflect localized impacts of human activities within the watershed but outside the preserve.

Generally, water-quality studies across the preserve have shown water quality to be fair to excellent; although in some areas water quality is degraded with respect to particular parameters. Water quality in Big Sandy Creek, Turkey Creek, Village Creek and the Neches River is generally good, but water quality in Pine Island Bayou is impaired for much of the year.

Big Thicket National Preserve’s most recent water-quality report reveals the following:

- Most dissolved oxygen violations are naturally caused in Big Thicket National Preserve.
- The majority of bacteria (*E. coli*) found in the streams of Big Thicket National Preserve is from non-point sources. In Big Thicket National Preserve, higher bacterial counts occur with higher discharge. This relationship is indicative of non-point sources because bacteria are washed into preserve waters during rainfall events. Consequently, high bacteria levels coincide with high flows and it is possible that any stream in the preserve may exceed the standard if sampled during high flow.
- The pH levels at BITH are naturally low. NPS sampling shows an overall decline in pH over the past three years.
- NPS data show that stream temperatures are very near the state maximum limits, and on several occasions, have exceeded these standards.
- Since 2010 a mercury fish consumption advisory has been posted for the Neches River and all contiguous waters in Angelina, Hardin, Houston, Jasper, Polk, Trinity, and Tyler counties. This includes the entire reach of Village Creek and the Neches River upstream of Evadale. While the above issues originate from within the watershed, mercury sources are probably atmospherically derived.

The frequency and duration of saltwater intrusion events can be expected to increase as demand for freshwater in the greater Beaumont area increases and the Port of Beaumont Channel is maintained and deepened. While the LNVA Saltwater Barrier can keep most non-surge saltwater intrusions from entering the preserve upstream from the structure, the new lands within the Beaumont unit will experience the full impact of high salinity events.

Preserve Waters Listed under the Federal Clean Water Act, 303(d) List

Stream	Segment	Problem
Neches River	Between Saltwater barrier and B.A. Steinhagen and all tributaries	Mercury (Hg) in fish
Pine Island Bayou	Mouth to mile 12.1	Low Dissolved Oxygen (DO)
Pine Island Bayou	Mile 12.1 to mile 35.4	Low DO Bacteria
Little Pine Island Bayou	Lower 25 miles	Low DO Bacteria
Village Creek	FM 418 to lake Kimball	Low pH
Village Creek	Entire stream	Hg in fish
Big Sandy Creek	Lower 30 miles downstream from US 190	Bacteria
Turkey Creek	Lower 25 miles	Bacteria

Potential threats to water quality today include point and non-point sources: (1) the effects of lumbering and wood production, (2) effects of road building on drainage patterns, (3) the effects of oil and gas exploration and production, including pollution from oil fields by brine and petroleum products, (4) the effects of development and construction on neighboring property, including erosion and siltation, and pollution from septic tanks entering the preserve via the water table, and (5) edge effects of all neighboring land-use practices on the corridor due to narrowness.

Intermountain Region Foundation Document Recommendation Big Thicket National Preserve

April 2014

This Foundation Document has been prepared as a collaborative effort between park and regional staff and is recommended for approval by the Intermountain Regional Director.

Douglas J. Neighbor *4/24/14*
RECOMMENDED Date
Doug Neighbor, Superintendent, Big Thicket National Preserve

Sue E. Masica *5/14/2014*
APPROVED Date
Sue E. Masica, Regional Director, Intermountain Region

for



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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