



NATIONAL FOREST AND GRASSLANDS IN TEXAS

FIRE MANAGEMENT PLAN

2014



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Interagency Federal fire policy requires that every area with burnable vegetation must have a Fire Management Plan (FMP). This FMP provides information concerning the fire management process for the National Forests and Grasslands in Texas and compiles guidance from existing sources such as but not limited to, the National Forests and Grasslands in Texas Land and Resource Management Plan (LMP), national policy, and national and regional directives.

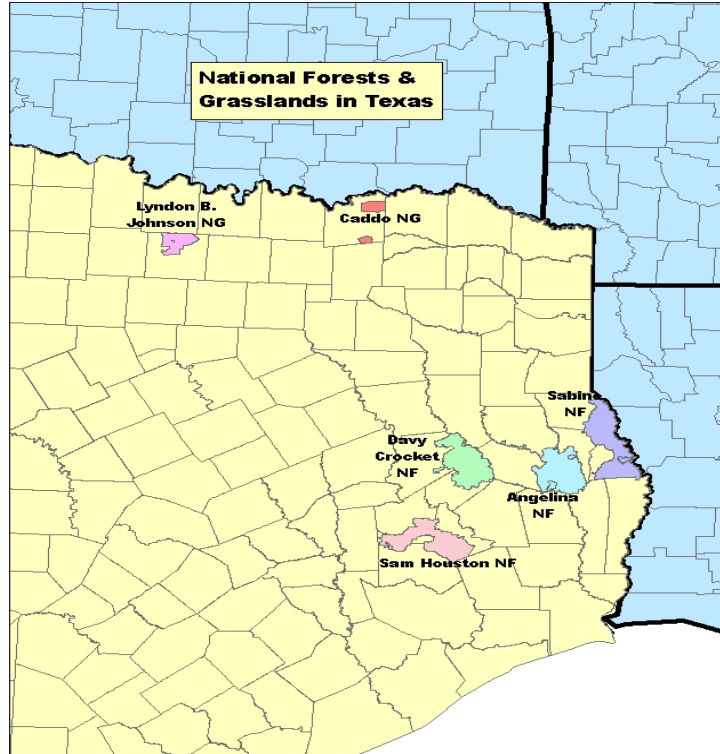
The potential consequences to firefighter and public safety and welfare, natural and cultural resources, and values to be protected help determine the management response wildfire. Firefighter and public safety are the first consideration and are always the priority during every response to wildland fire.

The following chapters discuss broad forest and specific Fire Management Unit (FMU) characteristics and guidance.

Chapter 1 introduces the area covered by the FMP, includes a map of the National Forests and Grasslands in Texas, addresses the agencies involved, and states why the forest is developing the FMP.

Chapter 2 establishes the link between higher-level planning documents, legislation, and policies and the actions described in FMP.

Chapter 3 articulates specific goals, objectives, standards, guidelines, and/or desired future condition(s), as established in the forest's LMP, which apply to all the forest's FMUs and those that are unique to the forest's individual FMUs.



Chapter 1. INTRODUCTION

The National Forests and Grasslands in Texas (NFGT) developed this FMP as a decision support tool to help fire personnel and decision makers determine the management response to an unplanned ignition. FMPs do not make decisions. Instead, they provide information, organized by FMUs, which provides a finer scale summarization of information than is possible at the forest level. These descriptions bring specific detail about the identifiable areas on the ground. FMPs are not static documents. They will evolve and be revised as conditions change on the ground and as modifications are made to the unit's FMP.

The NFGT is comprised of 637,475 acres in four Forests, and 38,100 acres in two Grasslands. The National Forests are located in-the "Piney woods" of east Texas, surrounded by private timberlands owned by both small and large landowners. However, all the major corporate landowners, such as Champion International, Louisiana Pacific and Temple-Inland have sold the majority of their land holdings to Timber Management Investment Organizations (TIMO's). The National Forests are in the Humid Temperate Domain, Subtropical Division, Southeastern Mixed Forest province of R G Baley's Ecoregion Classification System. The Grasslands are in the Prairie Division and Prairie Parkland Province Local, relief for both areas range from 100 to 600 ft, and 80 percent of the areas are gently sloped. Precipitation averages around 35 to 40 inches on the Grasslands, and up to 60 inches annually in the Forest areas The NFGT are intermingled with private and T ownerships. Many isolated parcels of a few acres to several hundred 'acres occur throughout all districts. Access and rights-of-way management are extremely complex. Major population centers within two hours driving time of the Forests include Houston and Beaumont, Texas and Shreveport, Louisiana. The two Grasslands are within one hour driving time of the Dallas-Fort Worth metropolitan areas, in North Central Texas.

The purpose of the NFGT Fire Management Plan (FMP) is to identify and integrate all wildland fire management and related activities with the context of the approved LMP. The FMP allows resource management direction found in the LMP to facilitate development implementation of fire management strategies. The FMP does not document fire management decisions; rather it provides the operational direction to implement the goals and objectives in the LRMP. This FMP applies to the lands administered by the NFGT. This document provides information, organized by Fire Management Unit (FMUs) which provide a finer scale summarization of information than is possible at the forest-wide level.

Chapter 2. POLICY, LAND MANAGEMENT PLANNING, AND PARTNERSHIPS

The 1996 NFGT LRMP, which was developed through both an internal and a public involvement process, forms the basis for this FMP. This FMP is a detailed program of action to carry out fire management policies; it will help achieve resource management objectives as defined in NFGT's LRMP.

The 2001 Federal Wildland Fire Management Policy (updated from 1995 policy) and the Revised Land and Resource Management Plan, NFGT (1996), are the guiding policy documents for fire management on the Forest.

The 2001 Federal Wildland Fire Management Policy directs Federal agencies to achieve a balance between suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. The policy provides nine guiding principles that are fundamental to the success of the Federal wildland fire management program:

1. Firefighter and public safety are the first priority in every fire management activity.
2. The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.
3. Fire Management Plans, programs, and activities support land and resource management plans and their implementation.
4. Sound risk management is a foundation for all fire management activities.
5. Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.
6. Fire Management Plans and activities are based upon the best available science.
7. Fire Management Plans and activities incorporate public health and environmental quality considerations.
8. Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.
9. Standardization of policies and procedures among federal agencies is an ongoing objective.

2001 Federal Wildland Fire Management Policy (updated from 1995 policy):

- **Safety**
Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.
- **Fire Management and Ecosystem Sustainability**
The full range of fire management activities will be used to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components.
- **Response to Wildland Fire**
Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of the fire. The circumstances, under which a wildland fire occurs, and its likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate management response to the wildland fire.
- **Use of Wildland Fire**
Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of fire will be based on approved Fire Management Plans and will follow specific prescriptions contained in operational plans.

- **Rehabilitation and Restoration**
Rehabilitation and restoration efforts will be undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure.
- **Protection Priorities**
The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected, human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.
- **Wildland Urban Interface**
The operational roles of federal agencies as partners in the wildland urban interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, state, or local governments. Federal agencies may assist with exterior structural protection activities under formal fire protection agreements that specify the mutual responsibilities of the partners, including funding. (Some federal agencies have full structural protection authority for their facilities on lands they administer, and may also enter into formal agreements to assist state and local governments with full structural protection.)
- **Planning**
Every area with burnable vegetation must have an approved Fire Management Plan. Fire Management Plans are strategic plans that define a program to manage wildland and prescribed fires based on the area's approved land management plan. Fire Management Plans must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objective, activities of the area, and environmental laws and regulations.
- **Science**
Fire Management Plans and programs will be based on a foundation of sound science. Research will support ongoing efforts to increase our scientific knowledge of biological, physical, and sociological factors. Information needed to support fire management will be developed through an integrated interagency fire science program. Scientific results must be made available to managers in a timely manner and must be used in the development of land and resource management plans, Fire Management Plans, and implementation plans.
- **Preparedness**
Agencies will ensure their capability to provide safe, cost-effective fire management programs in support of land and resource management plans through appropriate planning, staffing, training, equipment, and management oversight.
- **Suppression**
Fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

- **Prevention**
Agencies will work together and with their partners and other affected groups and individuals to prevent unauthorized ignition of wildland fires.
- **Standardization**
Agencies will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, value-to-be-protected methodologies, and public education programs for all fire management activities.
- **Interagency Cooperation and Coordination**
Fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.
- **Communication and Education**
Agencies will enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education programs. These programs will be continuously improved through the timely and effective exchange of information among all affected agencies and organizations.
- **Agency Administrators and Employee Roles**
Agency administrators will ensure that their employees are trained, certified, and made available to participate in the wildland fire program locally, regionally, and nationally as the situation demands. Employees with operational, administrative, or other skills will support the wildland fire program as necessary. Agency administrators are responsible and will be held accountable for making employees available.
- **Evaluation**
Agencies will develop and implement a systematic method of evaluation to determine effectiveness of projects through implementation of the 2001 Federal Fire Policy. The evaluation will assure accountability, facilitate resolution of areas of conflict, and identify resource shortages and agency priorities.

2.1. National and Regional Fire Management Policy

Forest Service policy and direction that are relevant to this plan include:

- National Fire Plan (2001)
- Forest Service Manual 5100
- Forest Service Handbook 5109
- Aerial Application of Fire Retardant, Decision Notice 2011
- USDI Fish and Wildlife Services (FWS) Technical/Agency Second Revised Recovery Plan for the Red-Cockaded Woodpecker, January 27, 2003.
- 1995 Federal Wildland Fire Management Policy and Program and Review (January 2001)

- Wilderness Fire Management Manual 2300, specifically FSM 2324 and is as follows: 2324.2 - Management of Fire
- Interagency Standards for Fire and Aviation Operations(2013)
- Guidance for Implantation of Federal Wildland Fire Management Policy (February 13, 2009).

Guidance states that "Wildland fire is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types:

- a. Wildfires – Unplanned ignitions or prescribed fires that are declared wildfires
- b. Prescribed Fires - Planned ignitions."

The Guidance further states that "A wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape. Objectives are affected by changes in fuels, weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives" and that "Management response to a wildfire on Federal land is based on objectives established in the applicable Land/ Resource Plan ... Initial action on human-caused wildfire will be to suppress the fire at the lowest cost with the fewest negative consequences with respect to firefighter and public safety."

2.2. National Forests and Grasslands in Texas Land and Resource Management Plan

Forest Service Policy and direction that are relevant to this plan include:

- National Forests and Grasslands in Texas Land and Resource Management Plan, 1996
- Amendment #7 to the 1996 Revised Land and Resource Management Plan (April, 2006)
- Amendment #10 to the 1996 Revised Land and Resource Management Plan (September, 2010)
- The FEIS and ROD for Vegetation Management in the Coastal Plains/Piedmont (February 27, 1989)
- The FEIS and ROD for the Suppression of the Southern Pine Beetle (April 6, 1987)

2.3. Partnership

Cooperative Wildland Fire Management and Stafford Act Response Agreement with the Texas A&M Forest Service.

Chapter 3. FIRE MANAGEMENT UNIT DESCRIPTIONS

The primary purpose of developing FMUs in fire management planning is to assist in organizing information in complex landscapes. FMUs divide the landscape into smaller geographic areas to show each districts safety considerations, physical, biological, social characteristics and to frame associated planning guidance based on these characteristics.

The following information, including the summaries of fuels conditions, weather and burning patterns, and other conditions in specific FMUs, helps determine the management response to an unplanned ignition and provides a quick reference to the strategic goals in the forest’s LMP.

When making a decision for Planned or Unplanned fire proper procedures from the Forest Land Management Plan will need to be followed for all Management Areas.

3.1. Fire Management Considerations Applicable to All Forest Fire Management Units

The Fire Management Plan establishes specific geographic areas as Fire Management Units (FMUs). Each FMU establishes prescriptive criterion and other guidance, which provide area specific direction for managers to implement the objectives of the LMP and other activity-level plans. There are six FMUs. See Table 1. FMU.

Table 1. FMU

FMU	FMU Name	Description/Location
1	Lyndon B. Johnson and Caddo Grasslands	Unit boundaries are the same as the Lyndon B. Johnson and Caddo National Grasslands
2	Angelina	Unit boundaries are the same as the Angelina National Forest
3	Davy Crockett	Unit boundaries are the same as the Davy Crockett National Forest
4	Sam Houston	Unit boundaries are the same as the Sam Houston National Forest
5	Sabine	Unit boundaries are the same as the Sabine National Forest

3.1.1.Land and Resource Management Plan Guidance

Forest wide desired conditions, goals and objectives related to fire management activities as described in the Land and Resource Management Plans (LRMP) for the NFGT. For a comprehensive listing of management activities for all resources, please see the appropriate section of the Land and Resource Management Plan (LRMP).

Strategic Goals:

The NFGT has established five strategic goals which will guide the Forest Supervisor and District Rangers during the implementation of this Plan These goals are as follows

Biological Environment-Sustain the biologically diverse ecosystems that provide the many natural resources both living and non-living, that occurs on these NFGT lands in north and east Texas,

Social-Provide social and cultural benefits for the American public and the many Forest and Grassland users from a recreational, environmental, and aesthetic perspective,

Economic-Continue economic benefits that contribute to the support of communities within the planning area,

Production-Through sound Ecosystem Management practices, maintain the continual flow and the long-term productivity and sustainability of renewable natural resources without long-term detriment to other resource values, and

Physical Environment-Implement practices that ensure clean air, soil productivity, and water quality, which are key to the sustainability

Objectives

Biological Environment:

- b. Protect and improve habitat for threatened, endangered, and sensitive plant and animal species Develop habitat for threatened, endangered, or sensitive species not provided on privately owned forests and grasslands, while providing populations of other species that occur within Forest and Grassland succession stages
- c. Manage wilderness to preserve the character of its living and nonliving components, while allowing natural processes to develop
- d. Implement appropriate sivilcultural practices based on site specific inventory data that promotes the diversity of the landscape
- e. Maintain, improve, or restore unique ecosystems using ECS information and restoration of ecological processes emphasizing the fire dependent longleaf and shortleaf pine ecosystems
- g. Manage fire-dependent ecosystems and communities through a prescribe burning program, providing resource protection and ecological management needs

Economic Objectives:

- g. Provide cost-effective fire protection for public lands and prevent loss of human life.
- h. Improve Forest and Grassland resource production through a prescribed burning program.

Physical Environment Objectives:

- d. Implement procedures and precautions that promote air quality consistent with Federal and State laws.

Forest Wide Standards and Guidelines

Air Quality

- FW-001** Management activities will maintain air quality that meets applicable Federal and State Standards and Regulations
- FW-002** Management activities will maintain air quality in Environmental Protection Agency (EPA) determined non-attainment areas in conformity with the State Implementation Plan. Conformity determinations will be made and documented as required by the State Implementation Plan and regulations.
- FW-004** Apply applicable Forest Service or State Smoke Management Guidelines during prescribed burns.

Biological Diversity

- FW-021** Evaluate older forest stands scheduled for entry and management that demonstrate old-growth characteristics during site-specific environmental analysis. Older Forest stands (100 years old or older) may be identified during site-specific analysis as providing opportunities for accomplishing Forest-wide old growth objectives. After evaluation, stands so designated will then be managed to enhance that older forest character. In stands where old-growth character are present and the stand contributes to an identified need for old growth, the priority action for that stand should facilitate maintaining or improving that older forest condition unless emergency or other circumstances dictate other management strategies and desired conditions.
- FW-023** Maintain or re-establish ground cover, and repair areas of bare soil using appropriate native and desirable non-native plant species.

Endangered, Threatened Species or Communities

- FW-025** Inventory, identify, protect, and manage habitat for proposed endangered, threatened, sensitive species, and exemplary plant communities.

Chemicals

- FW-031-7** Areas are not prescribed burned for at least 30 days after herbicide treatment (VM-59)

Fire
Prescribed Fire

FW-061 Utilize prescribed fire as a tool to manage fire-dependent communities and ecosystems, timber production, fuel reduction, forage, range and wildlife habitat improvement in combination with other treatments.

- a. Prescribed burning is conducted in a manner that is in compliance with air quality standards.
- b. Prescribed fire frequency and timing will be based on management area direction as guided by Ecological Classification System.

FW-062 To minimize erosion on fire lines, develop water bars as specified in forest-wide soil and water standards and seed bare earth

Cool season annual grasses such as rye will be sown on freshly disturbed soil for cover crops to protect fire lines constructed for winter burns

FW-063 For vegetation management actions using fire as a tool, the following standards from the Record of Decision of the Coastal Plain-Piedmont Vegetation Management FEIS will be followed.

FW-063-1 Site-specific planning for all prescribed burns is done by trained resource specialists and approved by the appropriate Forest Service line officer prior to project implementation. This planning includes description of treatment area, burn objectives, weather factors, and fuel moisture conditions, and resource coordination requirements. Coordination requirements include provisions for public and worker safety, burn day notification of appropriate agencies and persons, smoke management to comply with air quality regulations and protect visibility in Class I areas, protection of sensitive features, as well as fire line placement, specific firing patterns, ignition methods, and mop-up and patrol procedures. A post-burn evaluation compares treatment results with plan objectives. (VM-27)

FW-063-2 Prescribed fires in loblolly and shortleaf even-aged pine stands are generally not done until pines are about 10 to 15 feet tall (or 3 to 4 inches in diameter) at ground level. In longleaf pine stands, burns can be used prior to height growth for brownspot disease control when root collars of grass stage seedlings are at least 03 to 05 inch in diameter. After height growth begins, burns can be used once seedlings are 3 to 5 feet tall. (VM-28)

Prescribed fire may be used according to approved burning plans for control of brown spot, pre-commercial thinning and other actions appropriate to achieve the desired future condition.

- FW-063-3** Slash burns are done so they do not consume all litter and duff and alter structure and color of mineral soil on more than 20 percent of the area. Steps taken to limit soil heating include use of backing fires on steep slopes, scattering slash piles, and burning heavy fuel pockets separately (VM-29)
- FW -063-4** On severely eroded forest soils, any area with an average litter-duff depth of less than ½ inch is not burned. (VM-30)
- FW-063-5** Where needed to prevent erosion, water diversions are installed on fire lines during their construction, and the fire lines are re-vegetated promptly after the burn. (VM-32)
- FW-063-6** Fire lines which expose mineral soil are not located in filter strips along lakes, perennial or intermittent springs and streams, wetlands, or water-source seeps, unless tying into lakes, streams or wetlands as firebreaks at designated points with minimal soil disturbance. Low intensity fires with less than 2-foot flame lengths may be allowed to back into the strip along water bodies, as long as they do not kill trees and shrubs that shade the stream. The strip's width in feet is at least 30 plus 15 times the percent slope. (VM-33)
- FW-063-7** When wetlands need to be protected from fire, fire lines are plowed around them only when the water table is so low that the prescribed fire might otherwise damage wetland vegetation or organic matter. Previous fire lines are reused as much as possible. (VM-34)
- FW-063-8** If a fire line is required next to a wetland, it is not plowed in the transition zone between upland and wetland vegetation except to tie into a natural firebreak. (VM-35)
- FW-063-9** The best available technology to control smoke emissions is used, including accelerated mop-up, rapid ignition techniques, and burning when moisture conditions limit total smoke production. Burning is not done during stagnant weather nor when predictions indicate that smoke drift into highways, airports, populated areas, or other sensitive areas may be hazardous (VM-37)
- FW-063-10** Oak, oak-gum-cypress, and oak-pine stands and inclusions are protected by excluding fire or by using low-intensity backing fires (VM-38)
- FW-063-11** Generally, understory burns are not scheduled during nesting season to avoid disrupting reproductive activities. Forest managers may, however, use burns to meet specific objectives, such as protecting threatened and endangered species (e g, red-cockaded woodpecker), reestablishing natural ecosystems, controlling brown spot disease and promoting longleaf height growth, and site preparation. Burns are planned and executed to avoid damage to habitat of any threatened, endangered, proposed, or sensitive species (such as destruction of bald eagle nest trees). (VM-39)

- FW-063-12** Burns are planned to achieve their most desirable distribution for wildlife habitat and to try to break up large, continuous fuel types. When consistent with burning objectives, burns are done to create a mosaic pattern of fuel types that complements fuel treatment and wildlife objectives. (VM-40)
- FW-063-13** Critical values of the Keetch-Byram Drought Code are developed for all major vegetation- soil- landform types on which prescribed fires are conducted. Burning is allowed only on days when the Drought Code is less than this critical value. (VM-41)
- FW-063-14** Prescribed fires are conducted under the direct supervision of a burning boss with fire behavior expertise consistent with the project's complexity. All workers must meet health, age, physical and training requirements in FSM 5140, and use protective clothing and equipment. (VM-42)

Fire Suppression

- FW-064** Provide a level of protection from wildfire that results in the least total combined cost of presuppression, suppression, and net value change (most efficient level) except where management direction requires a more intense level of protection
- FW-065** Implement the most efficient level (M.E.L.) fire program budget identified by The Level II Fire Management Analysis and as determined through the annual fire management action plan
- FW-066** Use an appropriate suppression response which minimizes the combined cost of suppression action and resource damage. The suppression response may be confinement, containment, or control.
- FW-067** The suppression response is control where life, public safety or private property is threatened.

Integrated Pest Management

- FW-077** For SPB control, the following standards and guidelines from the Record of Decision of the Southern Pine Beetle FEIS apply.
3. When pile and burn is used to control SPB, the work will comply with the Forest Service Manual directions on air quality management for prescribed fire (Chapters 2120, Air Resource Management, 5140, Prescribed Fire, and 5150, Fuel Management). All Federal and State air pollution laws must be followed. (SPB-5)
 4. Weather conditions will be closely monitored before prescribed burning activities occur to ensure that atmospheric conditions allow for quick smoke dispersal to maintain air quality Air quality values for Class I wildernesses and

national forest lands will be protected by conducting prescribed burning under a smoke management plan. (SPB-6)

Silvicultural Practices

- FW-204-6** Safety equipment for Forest Service workers (such as hard hats, eye and ear protection, chaps, and fire retardant clothes) is worn as determined by a Job Hazard Analysis specified in the Health and Safety Code Handbook. (FSH 6709 11) This analysis estimates risks to specific body parts and prescribes needed protection. (VM-13)
- FW-204-23** Forest Service equipment operators must demonstrate proficiency with the equipment and be licensed to operate it. A helper must direct the operator where safety is compromised by terrain or limited sight distance. (VM-53)
- FW-204-24** Chain saw operators must be periodically certified and demonstrate proficiency with chain saws. (VM-85)

Soil and Water

- FW-212** Do not operate equipment if damage occurs during wet ground conditions.
- Operation of equipment should generally be stopped when 30 percent of the traffic area has ruts that are 6 inches or deeper. Exception for pond construction, soil erosion and rehabilitation, facility maintenance and construction or fire suppression activities may apply.

3.1.2. Physical Characteristics that Apply to All Fire Management Units

See Individual FMU Guidance

3.2. Fire Management Considerations for Specific Fire Management units

- 3.2.1. C Angelina FMU
- 3.2.1. B Davy Crocket FMU
- 3.2.1. C Grasslands FMU
- 3.2.1. D Sabine FMU
- 3.2.1. E Sam Houston FMU

3.2.1 Fire Management Considerations for Specific Fire Management Units

3.2.1. C FMU Snap Shot

- FMU Number: Angelina NF
- Fire Behavior Indicator: BI
- NFDRS Weather Station: Sabine North, Station ID, 412901, and Sabine South, Station ID, 413701
- Nearest Weather Station: Sabine North, Station ID, 412901, and Sabine South, Station ID, 413701
- Acres/Agency: 153,174 acres, USFS
- Predominant Vegetation Types: Southern Rough, pine stands on relatively flat to rolling hills with sandy loams. The understory vegetation is dominated by woody shrubs and subdominant hardwood species. Hardwood bays can also be found throughout the FMU.
- Unit: 11
- IA assets assigned to this FMU: Two type 3 Dozers and one type 5 Engine
- Duty Officer: Jamie Sowell or Dale Snyder
- IA Dispatch Office: Texas Interagency Coordination Center
- Communities adjacent or within FMU: Broaddus, Zavalla and Huntington

Options available for management response to wildland fires:

Management Actions allowed in this FMU

The response to wildfires in this FMU includes the full range of suppression strategies. “The suppression response may be confinement, containment, or control.” (NFGT LRMP 1996, pg. 64) Thus initial actions may include size-up, patrolling, monitoring, holding actions, or an aggressive initial attack.

Initial response to fires within the FMU will require an assessment as to what initial action to take. The FMO/IC begins this assessment immediately by evaluating the probable cause and location of the fire relative to the hazards to firefighters/public and the risk to natural resources.

Commensurate with the assessment, initial attack resources are dispatched to a fire under the assumption that the fire is to be managed to meet protection objectives unless directed otherwise. Human caused fires will be suppressed to meet protection objectives that minimize negative consequences with respect to firefighters and public safety.

Fire Managers and Line Officers will use the Wildfire Decision Support System (WFFDS) to guide and document wildfire management decisions. The WFFDS will provide situational assessment, analyze hazards and risks, define implementation actions, and document decisions and the rationale for decisions.

- **3.2.2. C FMU Guidance**

- This section describes direction specific to the management areas (MAs) on the Angelina NF that coincide with the Angelina FMU. The goals, desired future conditions, objectives, standards and guidelines for the area make up the management area direction. The MAs are identified by number and name. Forest-wide goals, objectives, and standards and guidelines apply to all management areas unless specifically exempted or modified by the management area direction.

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- **Management Area 1: Upland Forest Ecosystems**

- **Desired Conditions**

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Mayflower Uplands, Deep Sandy Uplands, and Clayey Uplands LTA's) on the Angelina NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridgetops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas the longleaf type had been replanted to slash pine and these areas will be converted back to the native longleaf as soon as possible. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switchgrass, and Indian grass). Interspersed within this Longleaf Pine Ecosystem is a diverse array of mixed forests on the lower slopes of ridges, extending into the streams. Hardwood bottomlands, drainages, seeps, and bogs will perpetuate subtle to major hydrologic differences in the uplands. Many stream courses will portray characteristics of the mixed forest ecosystem, although frequent fires on the uplands will limit the development of these mixed forest communities to the very wettest and widest riparian areas. Narrow stream courses and wetlands will develop an open aspect similar to the upland communities. These inclusions create transitions that begin with pure longleaf pine, grading to mixed species such as loblolly, shortleaf, and oaks, then gradually transcend into bottomland hardwood areas along larger streams.

- **Objectives**

This area is managed for regeneration and restoration of the Upland longleaf and shortleaf Forest Communities. Prescribed fires and their effects will be evident on many of the upland areas.

Goals

Provide opportunity for timber production, mineral exploration and development, and limited grazing while maintaining a predominantly natural appearing landscape, clean water, productive soil, little soil erosion, viable populations of wildlife, and habitat for threatened, endangered, or sensitive species of plants and animals.

Standards and Guidelines

Ma-1-31 Utilize prescribed fire to manage the various components of the ecosystems.

- a. Fire frequency will generally range from three to seven years. More frequent burning may be required in certain plant communities, as prescribed by site-specific environmental analysis.
- b. Emphasize growing season burning in habitat that was historically maintained by growing season fires

MA-1-32 Wildfire suppression response may be confinement, containment, or control.

Management Area 2: Red-cockaded Woodpecker (RCW) Emphasis

Desired Conditions

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Mayflower Uplands, Deep Sandy Uplands, and Clayey Uplands LTA's) on the Angelina NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridgetops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas the longleaf type had been replanted to slash pine and these areas will be converted back to the native longleaf as soon as possible. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switchgrass, and Indian grass). Interspersed within this Longleaf Pine Ecosystem is a diverse array of mixed forests on the lower slopes of ridges, extending into the streams. Hardwood bottomlands, drainages, seeps, and bogs will perpetuate subtle to major hydrologic differences in the uplands. Many stream courses will portray characteristics of the mixed forest ecosystem, although frequent fires on the uplands will limit the development of these mixed forest communities to the very wettest and widest riparian areas. Narrow stream courses and wetlands will develop an open aspect similar to the upland communities. These inclusions create transitions that begin with pure longleaf pine, grading to mixed species such as loblolly, shortleaf, and oaks, then gradually transcend into bottomland hardwood areas along larger streams.

Objective

The long-term population objective for the NFGT is 1,385 active RCW clusters (541 on the Sam Houston, 330 on the Davy Crockett, and 514 active clusters on the Angelina [includes MA-6 Longleaf Ridge] and Sabine National Forests)

Goals

Provide a range of mature pine forest habitats that allow populations of threatened, endangered, or sensitive species dependent on these communities to flourish. Provide the best possible habitat for recovery of RCW populations and sub-populations, while allowing maximum potential for effective dispersal and social interaction of individuals between clusters.

Standards and Guidelines

MA-2-21 Utilize prescribed fire to control midstory, promote open upland forest communities, and to reduce fire hazard.

- a. Specific frequency, season, and prescription for burning in any area may vary depending upon vegetation, site and weather conditions, and RCW management priorities.
- b. Burn cycles should control encroaching vegetation while minimizing risk to cavity trees
- c. Cavity trees will be protected during burning operations
- d. Plow lanes will not be constructed within 200 feet of cavity trees unless needed to protect the cavity trees during an emergency.
- e. Emphasis is on growing season burning in habitat that was historically maintained by growing season fires

MA-2-22 Wildfire suppression response may be confinement, containment, or control with the primary objective of protecting RCW cavity trees.

MA2-80-3.2.3 Prescribed burning on a two to five year rotation is the preferred method to control midstory vegetation. In stands with dense, but small (less than two inches diameter) hardwood midstory more frequent burning may be necessary to achieve control.

In clusters, replacement or recruitment stands where hardwood midstory is too large to be killed by prescribed burning (greater than two inches diameter), the following methods may be used to remove midstory.

Mechanical methods such as a feller-buncher, hydro-ax, drum chopper, mulcher, shearing blade, etc.

Manual methods such as chainsaws, brush hooks, etc.

Herbicides applied by injection, hypo-hatchet, hand sprayer, etc.

Or a combination of these methods.

Maintenance burns for clusters, replacement and recruitment stands, which have already had the midstory removed, will receive priority.

Emphasize growing season burns in those habitats that were naturally maintained by growing season fire. After midstory is controlled and the native herbaceous vegetation re-established, burn during other seasons.

MA-2-80-3.3.3 Cavity Tree Protection During Prescribed Burning Operations

Burning prescriptions and cycles must minimize risk to cavity trees.

Cavity trees must be protected by raking away or back burning adjacent fuels, use of fire retardants, etc.

Plow lines will be kept 200 or more feet from cavity trees unless an emergency or site specific circumstance such as location of a property boundary, etc , dictate the need to locate them closer. If conditions dictate plow lines be placed within 200 feet of cavity trees, use of a dozer blade to lightly scrape away fuels is preferable to using a deep cutting plow.

MA-2-80-4.4 Prescribed Burning (Management in HMA)

Outside clusters, replacement and recruitment stands: the objective is midstory reduction (not total elimination) using primarily prescribed burning.

Establish a burning cycle of two to five years HMA-wide. In stands where fire has been excluded for many years, annual burning may be necessary to significantly reduce midstory.

Emphasize use of growing season burns in ecologically appropriate areas. Recognize, however, that habitat goals may require burning whenever conditions permit.

All burning prescriptions will be based on site specific conditions, including vegetation, site and weather conditions, and RCW management problems.

Use natural firebreaks (streams, roads, swamps, etc) whenever possible to reduce impacts of constructing firelines.

Management Area 4 Streamside Management Zones

-
- **Desired Conditions**
- The NFGT has approximately 49,800 acres in this management area and includes the bed, bank, and water resources of the rivers, perennial and intermittent streams, wetlands, and their adjacent land areas. This Management Area also includes shorelines of perennial water bodies and areas adjacent to these shorelines. This area occurs in all ecological units on the National Forests and Grasslands in Texas (NFGT), but is sometimes described as riparian and bottomlands land LTA. Throughout this management area you will see some of the most diverse and productive areas on the Forest. This management area provides contiguous and diverse habitat for riparian and wetland dependent species. Stream channels will remain stable providing suitable water quality. Limited manipulation of vegetation will filter sediment, thus maintaining aquatic habitat for those dependant species. Vegetation left within the management area will provide a continuous source of organic matter, which contributes to the soil building process. The desired future condition of vegetation groups will be described within these stream course definitions.
-
- **Rivers, Sloughs and Swamplands.** Baldcypress-Water Tupelo Series is a deciduous swamp forest that occupies some hydric soils in East Texas. Bald cypress and/or tupelo gum tend to dominate, but composition will depend on water depth, duration of flooding, and

disturbance. This community is often dense canopied, dominated by Bald Cypress and Water Tupelo with some red maple, ash, water locust, and swamp black gum. Standing water is present for much of the year.

-
- **Perennial Streams with Floodplain Forest.** Floodplain forest will most typically occur in well defined terraces along rivers and larger streams of the Forest and Caddo National Grassland. Floodplain Forest include the more hdyric **Overcup Oak Series**, the traditional **Water Oak-Willow Oak Series**, and the well-drained **Swamp Chestnut Oak-Willow Oak Series**. Red maple, water hickory, and willow oak are usually intermixed in the **Overcup Oak** community. Sweetgum, cherrybark oak, ash, and overcup oak, with ironwood, eastern hophornbeam, deciduous holly, and Florida maple in the understory can be found in **Water Oak-Willow Oak Series**. Sweetgum, overcup oak, and cherrybark oak in the overstory with dwarf palmetto in the understory can be found in the **Swamp Chestnut Oak-Willow Oak Series**.
-
- **Floodplain Forest Intermittent Streams.** Intermittent streams in both Forest and Grassland landscapes will develop on well drained streamcourses. These streamside zones may be difficult to distinguish from the adjacent upland areas due to a vegetation mix of species, especially if the surrounding uplands are oak-hickory or oak-pine type. The floodplain and topographical situation will help define this area, and in the more mesic intermittent streams, species from the periodically flooded perennial streams or **Floodplain Forest** areas may occur.
-
- **Mesic Forest Intermittent Streams.** Intermittent Streams developed on side slopes and areas between uplands and stream bottoms. Desired natural condition will be a multi-aged forest with many large-sized individuals. There is usually a rich assemblage of lichens, mosses and liverworts on soil, fallen logs, stumps, shrubs, and trees.
- **Inclusional Wetlands.** These inclusional communities will be associated with the longleaf pine landscape of the Mayflower and Sandy Uplands LTA. Composition in Sweetbay Magnolia Series; include gallberry holly, black titi, waxmyrtle, red maple, button bush, swamp gum, laurel greenbriar, and possumhaw vibernum. These sites are often associated with the Sphagnum-Beakrush Series (bogs). At times referred to as “baygall”, these areas could form a dense evergreen shrub thicket.

- **Objectives**

- This area will be managed to provide diverse stands of hardwoods and some pines, with a wide variety of understory vegetation. The water bodies such as lakes, perennial wetlands and associated areas contribute to the diversity and dispersion of native animals and plants with in each drainage, these drainages connect to the larger watersheds found throughout the NFGT. These linkages provide dispersal for populations of fish, wildlife and plants. This Management area will be managed to meet the recommendations in the Texas Wetlands Plan (TPWD 1988) and Best Management Practices (BMP) established by the state.

Primary objectives to manage for:

- * Maintenance of high quality water and abatement of downstream flooding.

- * Enhancement of all associated resources.
- * Protection of aquatic, riparian habitat and special plant communities.

Secondary objectives to manage for:

- * Dispersion for animal and plant species by maintaining connecting habitat among mature and old growth stands of trees,
- * Maintenance or improvement of mast-producing wildlife habitat,
- * Recreation and scenic use compatible with other riparian management objectives, and,
- * Special wildlife habitat needs such as for threatened and endangered species, raptor nests and perches, and nests/dens for cavity dependent species.

The actual streamside riparian management area boundaries shall be identified as an Intermittent Stream or Perennial Stream. Determination of those classifications shall be by an onsite reconnaissance of topographic and biotic features, or as determined by the Forest Soil Scientist, Botanist or Hydrologist during site-specific environmental analysis.

A Primary Zone and a Secondary Zone will be identified within the Stream Side Management Zone (SMZ). The primary zone will be a 50-foot protection zone to ensure primary objectives of the area are achieved. This primary zone will extend from the stream channel edge outward 50 feet on either side of the stream. The secondary zone will be delineated from the primary zone outward to the extent of the SMZ to achieve objectives of this zone. The outer edge of the SMZ will vary depending on both biological and physical factors within the LTA, historical use and topographical position.

Standards and Guides

MA-4-31 Prescribed fire may be used to enhance riparian vegetation or wildlife habitat.

- a. Encourage the use of green lines, wet lines, or foam lines rather than plowed firelines. Minimize the amount of plowed fireline which might impair the hydrology of the riparian ecosystems. Generally plowed firelines will not be allowed within the primary zone,
- b. Prescribed fire will generally not be used in large riparian areas,
- c. Low intensity backing fires may be used in smaller streamside zones,
- d. Fire maintained wetlands, baygalls and bogs should be burned frequently to meet the desired future condition.

MA-4-32 The appropriate wildfire suppression response may be confinement, containment, or control.

Management Area 5 Major Aquatic Ecosystems

This management area prescription applies to the 15,682 acres of lakes, reservoirs and the lands inundated by them at normal pool level. They are:

**Angelina and Sabine National Forests:
USFS Lands Inundated
By Sam Rayburn Reservoir - 9,427 acres**

Desired Conditions

Both submergent and emergent vegetation are maintained for fish and wildlife habitat. Shorelines are managed by the U. S. Forest Service according to this and other management area prescriptions to maintain a natural appearance.

Objectives

These areas provide a range of settings offering clean water, wildlife habitat, hunting, fishing and other recreational opportunities dependent on aquatic environments, with access from adjacent developed or primitive recreation areas. A portion of perennial streams, draining into these areas, support native fish populations that can provide fishing opportunities and riparian dependent species, such as waterfowl, that can provide hunting and wildlife viewing opportunities.

Goals

- * Maintain high quality, functioning aquatic ecosystems,
- * Maintain water quality sufficient to meet Clean Water Act and Texas Water Standards,
- * Minimize risks of downstream flooding,
- * Maintain viable populations of native fish and aquatic dependent wildlife species which would be found in man-made reservoirs,
- * Provide a safe, healthful, aesthetic, non-urban aquatic environment for the pursuit of natural resource-based recreation.

Standards and Guides

See Forest-wide Standards and Guides.

Management Area 6 Longleaf Ridge Special Area

This area of approximately 32,300 acres is located on the southern portion of the Angelina National Forest.

Desired Condition

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Mayflower Uplands, Deep Sandy Uplands, and Clayey Uplands LTA's) on the Angelina NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridgetops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas the longleaf type had been replanted to slash pine and these areas will be converted back to the native longleaf as soon as possible. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switchgrass, and Indian grass). Tree species adapted to frequent fire and nutrient limitation will replace other less tolerant species. Blackjack, bluejack, and post oak trees will be the few hardwood species that co-exist with the longleaf pine.

Objectives

The dominant character of this area is its open mature longleaf pine.

Goals

* Provide for the development of upland longleaf pine savannas that allow populations of threatened, endangered, or sensitive species dependent on these communities to flourish.

* Provide habitat for recovery of RCW populations and sub-populations, while allowing maximum potential for effective dispersal and social interaction of individuals between clusters. The population objective is 125 active clusters.

* Provide opportunity for timber production, mineral exploration and production, and grazing while maintaining a natural appearing landscape, clean water, productive soil, little soil erosion, viable populations of wildlife, and habitat for other threatened, endangered, or sensitive species of plants and animals.

* Provide a wide spectrum of dispersed recreation opportunities through the management of user activities and natural resource settings as follows.

Standards and Guides

MA-6-21 Utilize prescribed fire to control midstory, promote open upland forest communities, and to reduce fire hazard.

a. Specific frequency, season, and prescription for burning in any area may vary depending upon vegetation, site, and weather conditions, and RCW management priorities.

b. Burn cycles should control encroaching vegetation while minimizing risk to cavity trees.

c. Cavity trees will be protected during burning operations.

d. Plow lines will not be constructed within 200 feet of cavity trees, unless needed to protect the cavity trees during an emergency.

e. Emphasis is on growing season burning in habitat that was historically maintained by growing season fires.

MA-6-22 Wildfire suppression response may be confinement, containment, or control with the primary objective of protecting RCW cavity trees.

Management Area 7 Wilderness

The Turkey Hill and Upland Island Wilderness are found on the Angelina NF. Upland Island Wilderness Fire Management Initiative. Environmental Assessment for Fire Management for Upland Island. Signed April 28, 2010.

Desired Condition

Lands within this management area are administered to maintain or achieve a natural state. The area is generally maintained in a natural condition by allowing physical and biological processes to operate without human intervention. Activities are integrated in such a way that current human use leaves only limited and site-specific evidence.

Within wildernesses, the enduring resource of wilderness is maintained and perpetuated as one of the multiple uses of National Forest System land. Wilderness character and public values are protected and perpetuated including, but not limited to, opportunities for scientific study, solitude, education, physical challenge and stimulation, inspiration, and primitive recreation experiences.

The vegetation is primarily the result of natural succession and processes. Ecosystems are relatively unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces. The forest cover retains the primeval character of the environment.

Goals and Objectives

Restore fire to its natural, ecological role. Reduce the risks and consequences of wildfire within wilderness or escaping from wilderness. Preserve wilderness character and associated values. Provide for human safety.

Standards and Guides

MA-7-41 Fires should be prevented from threatening or causing damage to human life and adjacent non-wilderness property.

MA-7-42 Fires are managed in accordance with an approved Fire Management Plan for each wilderness.

MA-7-43 Prescribed fire may be used to manage wilderness as determined through site specific environmental analysis. Prescribed fire plans should address:

- a. The role of natural fire in fire dependent or related ecosystems, and
- b. Fuel loadings which are a fire risk to resources and values outside the wilderness.

MA-7-44 Favor suppression methods and equipment that cause the:

- Least alteration of the wilderness landscape;
- Least disturbance of the land surface;
- Least disturbance to visitor solitude;
- Least reduction of visibility during periods of visitor use;
- Least effects on other air quality-related values.

MA-7-45 Mechanical equipment may be used in wildfire suppression in accordance with Forest Service Manual direction.

MA-7-46 Firelines shall be rehabilitated as soon as possible after controlling wildfires.

MA-7-47 A prescribed fire action plan for each wilderness will identify the specific areas where prescribed fire can be applied to reduce fuel loading so that outside resources may be protected and maintain a fuel level that would allow fire to play its natural role.

Management Area 8b Protected River and Stream Corridors

Naches River Corridor found on the Angelina N.F.

Desired Conditions

A one-quarter mile corridor from each side of the rivers and any lands visible from them under Forest Service management exist in a natural to near-natural setting, and the rivers and channels are not modified in anyway.

Objectives

Management practices are designed so that the natural landscape appears unaltered.

Goals

- * Prevent modification of the free flowing characteristics of the identified rivers;
- * Protect, and to the extent practicable, enhance the outstandingly remarkable values of the identified river(s);
- * Preserve the eligibility and potential classification of the identified rivers.

These goals will be achieved through the following management related objectives:

- * Maintain a one-quarter mile corridor on each side of the river of high quality scenery and an essentially undeveloped shoreline;
- * Maintain and improve fish and wildlife habitat;
- * Provide opportunities for river-oriented recreation which are consistent with the largely undeveloped nature of the segment and dependent on free-flowing conditions;
- * Utilize other resources and permit other activities which maintain or enhance the wildlife habitat quality, river fisheries, scenic attractions, or recreation values.

Standards and Guides

MA-8b-31 Use prescribed fire for vegetative manipulation where necessary in fire dependent ecosystems to maintain or enhance desired conditions.

MA-8B-32 Suppression strategies, practices, and activities are limited to those which have minimal effects on scenic river values.

MA-8b-33 Suppress wildfires at the lowest acreage practicable. Prescribed natural fires may be allowed to burn within prescription in fire dependent ecosystems.

Management Area 8d Natural Heritage Areas

List of Natural areas on the Angelina NF

Site	Acres	Landtype Association
Prairie Creek Seep	8 acres	Clayey Uplands
Pophers Creek	166 acres	Clayey Uplands
Yellowjacket Branch	589 acres	Clayey Uplands
Bannister Pimpernel	20 acres	Clayey Uplands

Desired Conditions

For sites in Clayey Uplands the more mesic sites will have mesic hardwood tree species in the lower slopes and along drainages. Evidence of fire will fade and leaf litter will become increasingly thick on the ground. For the Clayey Uplands sites the stands should be of mixed pine-oak nearly pure longleaf pine, which dominate the overstory upland portions of these areas.

Objectives

Enhance, and promote sustainable populations of unique plants or plant communities.

Goals

In these areas, the natural disturbance effects of fire, weather, and erosive action should be allowed to work unimpeded. Allow frequent fire return intervals to enhance the species composition of fire maintained communities. Fires should be allowed to burn throughout the area and not be limited to specific sites, to allow natural plant community variability and ecotones to reestablish.

Standards and Guides

MA-8d-31 Limit suppression strategies, practices and activities to those which have minimal impacts to botanical values. Extinguish wildfires endangering the area.

MA-8d-32 Use prescribed fire to manage or maintain the botanical character and successional stages for which the area has been designated unless restricted in certain plant communities as defined in specific botanical areas.

MA-8d-33 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of the area.

Leave fire-caused debris for natural decay.

Management Area 8e Special Bottomland Areas

Ayish Bayou area (1,200 acres) adjacent to the Ayish Bayou River east of Turkey Hill Wilderness

Attoyac River area (3,500 acres) on the northern side of the Angelina N.F.

Upper Angelina River area (6,110 acres) ten miles north of Lufkin, Texas.

Desired Conditions

This management area retains its unique characteristic and is maintained in a natural to near-natural setting of riparian bottomland hardwoods.

Objective

Management practices do not alter the natural landscape.

Goals

Emphasis is placed on improving and maintaining the riparian characteristics of the bottomland hardwood component for potential old-growth characteristics and wildlife habitat values associated with the ecosystem.

Standard and Guides

MA-8e-21 Prescribed fire may be used for vegetative manipulation within the area and must conform to specific action that would protect or enhance the aesthetics, wildlife, or riparian characteristics of the area.

MA8e-22 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on defined values.

Management Area 8f Cultural Heritage Areas

Description

- Attoyac Bayou Archeological Area (180 acres) on the Angelina N.F.
- Ayish Bayou Archeological Area (1,330 acres) on the Angelina N.F.
- Old Aldridge Sawmill and Mill Town (600 acres) on the Angelina N.F.

Archeological and Historic Areas - A unit of land possessing features, sites, or a concentration of sites, buildings, structures, or objects united historically or prehistorically by plan or physical development, and which have been determined to be significant to our understanding of the prehistoric and historic occupation and utilization of the lands in which they are located.

Desired Condition

The historical integrity of the sites are maintained so that the scientific and educational values are retained.

Objective

Not Stated

Goals

Not Stated

Standards and Guides

MA-8f-31 Manage fire and fuels through suppression practices, management of ignited prescribed fire, and vegetation manipulation to protect the values for which the area is designated or to maintain or restore natural conditions.

MA-8f-32 Accomplish fire suppression and fuels management without the use of heavy equipment or fire plows in those areas where their use would endanger the historical or contextual integrity of site feature or cultural deposits.

Management Area 9a Developed Recreation Sites

On the Angelina N.F. the developed Recreation Sites are: Bouton Lake, Boykin Springs, Caney Creek, Harvey Creek, Sandy Creek, and Townsend.

Desired Condition

Areas and sites developed with recreational user facilities to enhance camping, picnicking, swimming, boating, and fishing for National Forest visitor's interpretation and enjoyment of using the Forest and Grassland environments are emphasized.

Objectives

Facilities will be as natural, simple, and unobtrusive as possible. When possible, management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals.

- * Provide a safe, healthful, aesthetic, and non-urban atmosphere for the pursuit of natural resource based recreation.
- * Provide facilities and improvement at an appropriate level of accessibility, consistent with resource protection needs and anticipated user demand.
- * Provide opportunities for meaningful recreation experiences consistent with user demand and expectation.

Standards and Guides

MA-9a-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9a-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

MA-9a-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 9b Minimally Developed Recreation Sites

Desired Conditions

Most areas have a low development scale with few amenities provided. These areas provide a wide spectrum of forest and rangeland settings offering a range of recreation opportunities.

Objective

Facilities will be as natural, simple, and unobtrusive as possible, when possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals

- * Provide facilities and improvements, consistent with resource protection needs, anticipated user demand, and compatible with management goals for the surrounding area, to support specialized and dispersed recreation use on the Forest and,
- * Provide a safe, healthful, aesthetic atmosphere for the pursuit of natural, resource based recreation.

Standards and Guides

MA-9b-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9b-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

Ma-9b-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 10b Special Use Permit Sites: Example Utility Corridors

Desired Condition

The desired future condition is a pattern of special uses established to provide facilities, services, or opportunities that are in the general public interest.

Objective

When feasible, special uses are combined in a single corridor rather than developing parallel corridors.

Goals

- * Provide safe, efficient facilities and improvements in an environmentally sensitive manner.
- * Authorize only those occupancies which promote and support the general public welfare, and do not conflict with law and Forest Service policy.
- * Minimize inconsistency with surrounding land uses and minimize the adverse impacts of these uses on other resources.

Standards and Guides

See Forest Wide

Management Area 11 Stephen F Austin (SFA) Experimental Forest

The 2,600 acre SFA Experimental Forest is seven miles southwest of Nacogdoches, Texas and is located within the proclamation boundary of the Angelina National Forest.

Desired Condition

The SFA Experimental Forest will be managed to meet the continuing demand for knowledge, protection, and management of the renewable resources of forest lands.

Objectives

This area is managed to conduct research with a primary function to assess the impacts of forest management practices on wildlife communities and to provide information for incorporating wildlife habitat needs into forest management practices.

Goals

Research activities will alter the vegetation and landforms on an irregular spatial and temporal basis.

Standards and Guides

See Forest Wide

3.2.3. C FMU Characteristics

3.2.3.1. C Safety

- **Flora and Fauna:** Texas is home to numerous plants and animals that could pose a safety risk to firefighters; the list includes poisonous snakes, wasps, biting insects (ticks and chiggers), and poison ivy to name just a few. The southern rough fuel type present in Texas is called the “Big Thicket” for a reason. Numerous thorny vines and briars are present in Texas and can make cross country travel difficult.
- **Snags:** Texas has been hit by several wind events and hurricanes over the last 10 to 15 years which has produced numerous snags that could pose a threat to firefighters and the general public and make fires harder to contain.
- **Environmental Conditions:** Texas is known for long, hot, humid, summer months that can lead to illness caused by overheating. During its short winter season Texas can also experience periods of freezing temperatures and the occasional ice storm or snow storm.

3.2.2.2B Physical

- The FMU is located approximately 30 miles southeast of Lufkin, TX, near the towns of Zavalla, Huntington, and Broaddus. The FMU boundary coincides with the Angelina NF proclamation boundary.
- **Topography:** The Topography is flat to gently rolling. The average slopes ranges from 0 to 5% though in some cases slopes can be as steep as 15 to 30%.
- Elevation ranges from 150 to 500 feet above sea level.

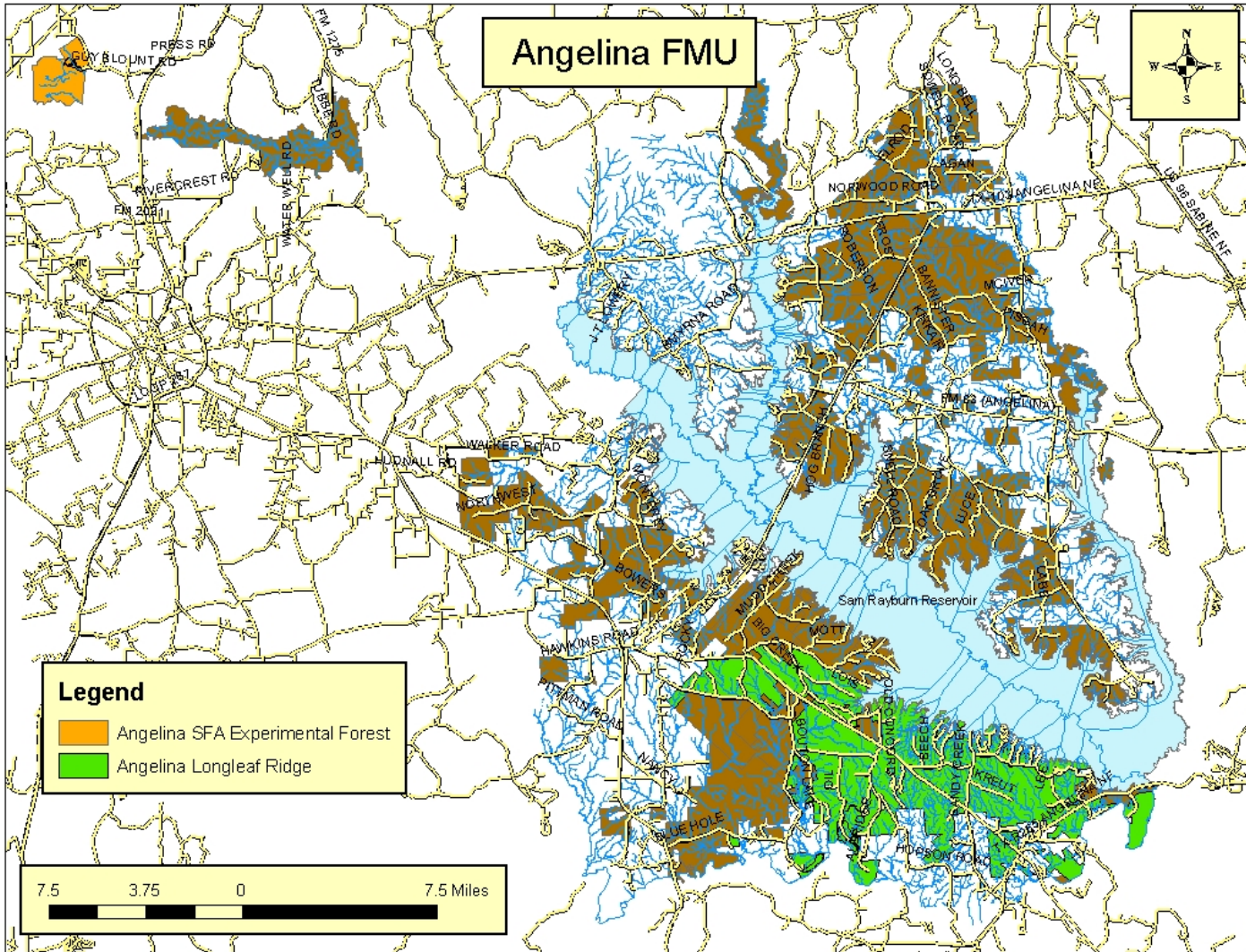


Figure 1: Angelina FMU

3.2.3.3. C Biological

Ecological Systems

Table 1 list the landtype phases or ecological classification system classifications found on the Angelina FMU. An ecological classification system classifies land into ecologically equivalent units on the basis of an integration of multiple components of the forest ecosystem including soils, physiography, and vegetation. A land classification based on these components reflects the influence of environmental characteristics of a site, and it gives information about its inherent ecological potential and types of living communities it will support.

Desired Ecological Systems for the Angelina FMU

Table 1: Approximate Acres for Landtype Phases

Landtype Phases	Approximate
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	Acres
American Beech-White Oak/Mitchella Loamy Moist-Mesic Steep Slopes and Ravines	2365
Baldcypress/Ceratophyllum Semi-Permanently Flooded Swamps	3827
Catahoula or Longleaf Pine/Schizachyrium Clayey Dry-Mesic Uplands	419
Drosera Sandy/Loamy Wet Herbaceous Seep	49
Longleaf Pine-(Shortleaf Pine)-Blackjack Oak/Schizachyrium Arenic Dry Uplands	286
Longleaf Pine/Schizachyrium Clayey Dry-Mesic Uplands	3410
Longleaf Pine/Schizachyrium Loamy Dry-Mesic Uplands	17160
Longleaf Pine-Blackjack Oak/Schizachyrium Arenic Dry Uplands	14069
Longleaf Pine-Bluejack Oak/Tragia Grossarenic Dry Uplands	806
Overcup Oak/Justicia Clayey/Loamy Seasonally to near Regularly Flooded Low River Floodplains	8334
Shortleaf Pine (Longleaf Pine)-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	82207
Shortleaf Pine-(Longleaf Pine)-Blackjack Oak/Schizachyrium Arenic Dry Uplands	907
Shortleaf Pine-(Longleaf Pine)-Bluejack Oak/Tragia Grossarenic Dry Uplands	47
Shortleaf Pine-Blackjack Oak/Schizachyrium Arenic Dry Uplands	96
Shortleaf Pine-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	889
Shortleaf Pine-Post Oak/Chasmanthium Clayey Dry-Mesic Uplands	7480
Small Stream and Riparian	4431
Sweetbay-Swamp Tupelo/Osmunda Loamy Wet Forested Seeps	352
Temporarily Flooded Bottomland	8338
White Oak-Loblolly Pine/Callicarpa Loamy Mesic Lower Slopes and Terraces	994
Willow oak/Justicia Clayey Wet Upland Depressions	2844
Willow Oak-Loblolly Pine/Justicia-Bignonia Loamy Seasonally Wet Flatwoods	326

3.2.2.4. C Resources (Wildland Urban Interface, Special Areas, and Recreation Resources)

- **Wildland Urban Interface**

The Sam Houston FMU has extensive urban interface. It is broken up into numerous blocks that are surrounded by houses and associated private development.

- **Special Designations**

Table 2: Special Area

Special Areas within FMU	Acres
Longleaf Ridge Special Area	32,300
SFA Experimental Forest	2,600
Upper Island	13,243
Turkey Hill	5,496

- **Recreation**

Trail System
 Camping
 Picnic

Table 3: List of Recreation areas on the Angelina FMU

Name	Type	Name	Type
BAYOU BOAT RAMP	BOATING SITE	CANEY CREEK	CAMPGROUND
BOUTON LAKE	CAMPGROUND	HARVEY CREEK	BOATING SITE
BOYKIN SPRING	CAMPGROUND	SANDY CREEK	CAMPGROUND
TOWNSEND	CAMPGROUND		

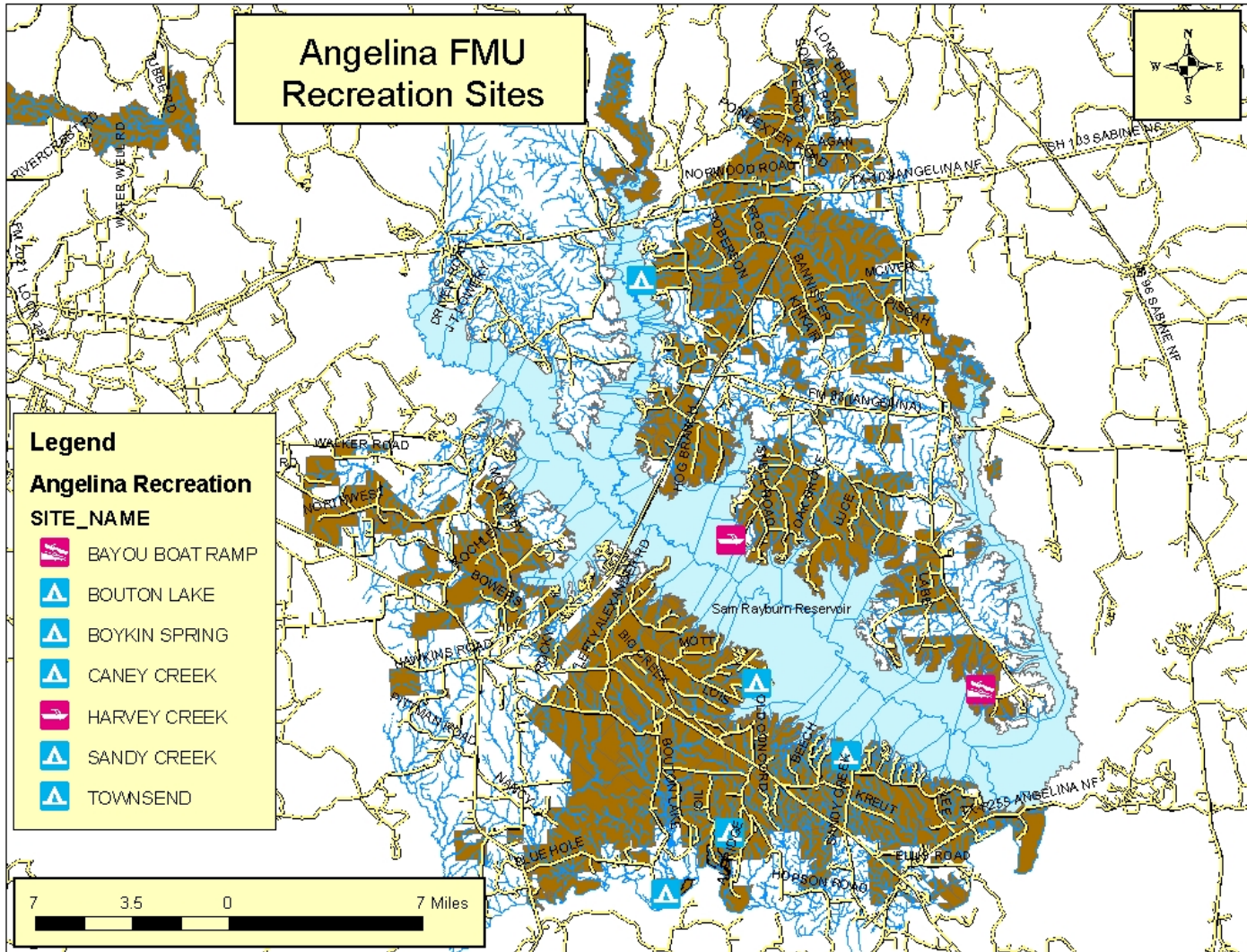


Figure 2: Angelina FMU Recreation Sites

3.2.4. C FMU Fire Environment

The Angelina has an aggressive prescribe burn program with much of the area on a 2-5 year burn rotation. The district personnel burn 20,000 to 40,000 acres a year. Extensive areas of fire dependent upland pines habitat can be found, noticeably in conjunction with RCW management areas. In areas that have not been treated with fire for several years, a build up of fuels has developed that includes volatile plant components and ladder fuels that can lead to more extreme fire behavior under certain conditions.

3.2.4.1. C Fire Behavior

The following Fuel Models are found on the Angelina NF.

Table 5: Fuel Models Present on the Angelina FMU (Source; Landfire)

Fuel Model With approximate acres	Fire Behavior Notes
GR3 284 acres	Primary carrier is grass, very little shrubs present. Average depth 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GR5 40 acres	Dense short grass, very little shrubs present. Average depth 1 to 2 feet. Spread rate can be high (twice as much as GR3) as can flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GS3 491 acres	A mixture of grass and shrubs. Moderate fuel loading, average depth less than 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Can have higher flame lengths as compared to GR3. Moisture of extinction is 30 to 40 percent. Found in areas that have been treated repeatedly with fire. Typically has a pine or hardwood overstory.
SH3 2567 acres	Pine overstory with a shrub understory, moderated fuel load, average depth 2 to 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent.
SH4 10962 acres	Pine overstory with a shrub understory, low fuel load, average depth 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent. When live herbaceous is fully cured can have a very high rate of spread much higher than SH3 and moderate flame length.
TL2 39745 acres	Pine overstory with a compact leaf litter, low fuel load, average depth 1 to 2 inches. Typical of a one year old rough. Spread rate low flame length low. Moisture of extinction is 25 percent.
TL6	Pine overstory with a moderate fuel load, average depth 2 to 4 inches.

108166 acres	Spread rate moderate . Moisture of extinction is 25 percent.
TU3 1222 acres	Pine or Oak Savanna with a moderate forest litter load and grass and shrub components. Spread rate is high, flame length is moderate. Moisture of extinction is 30 percent.

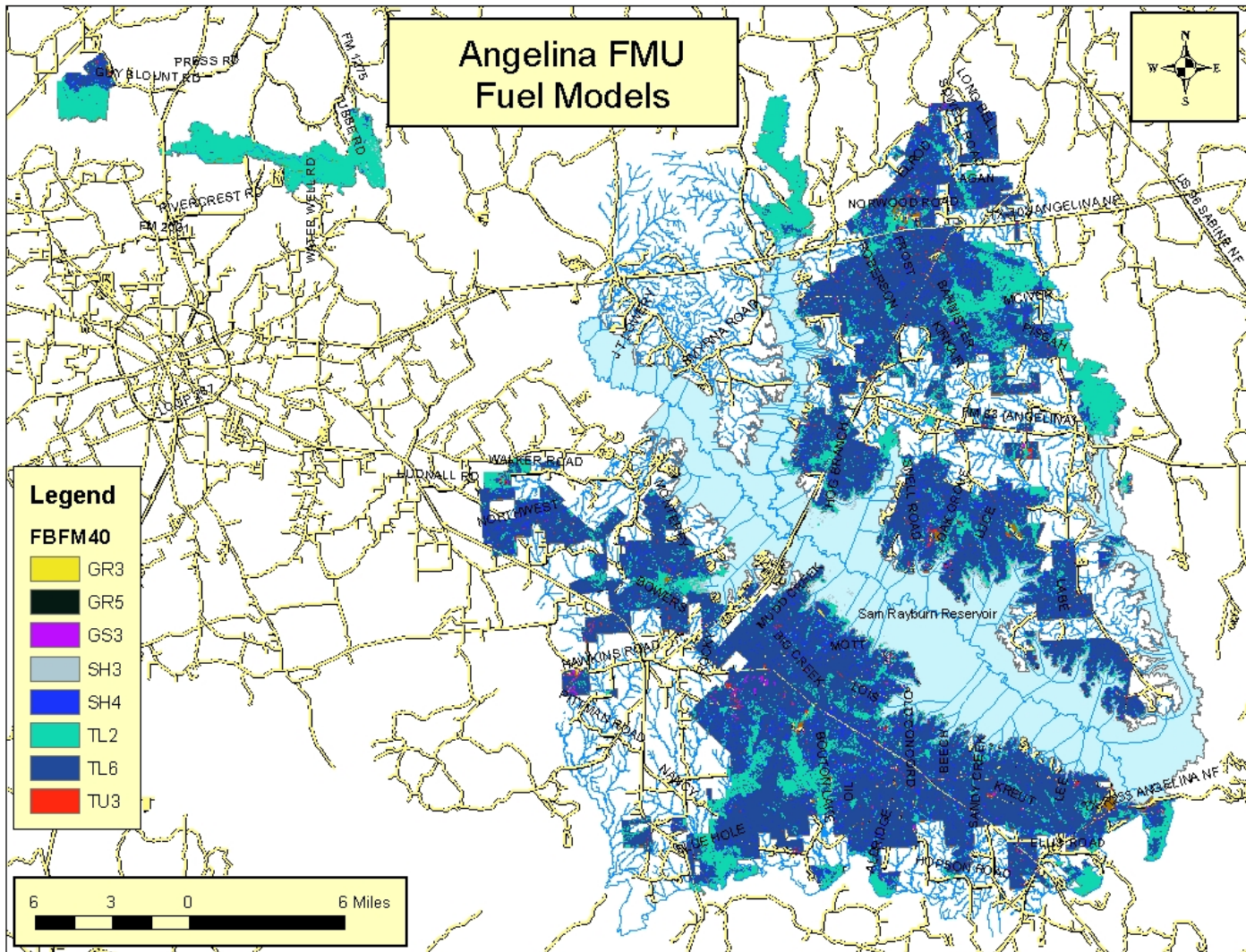
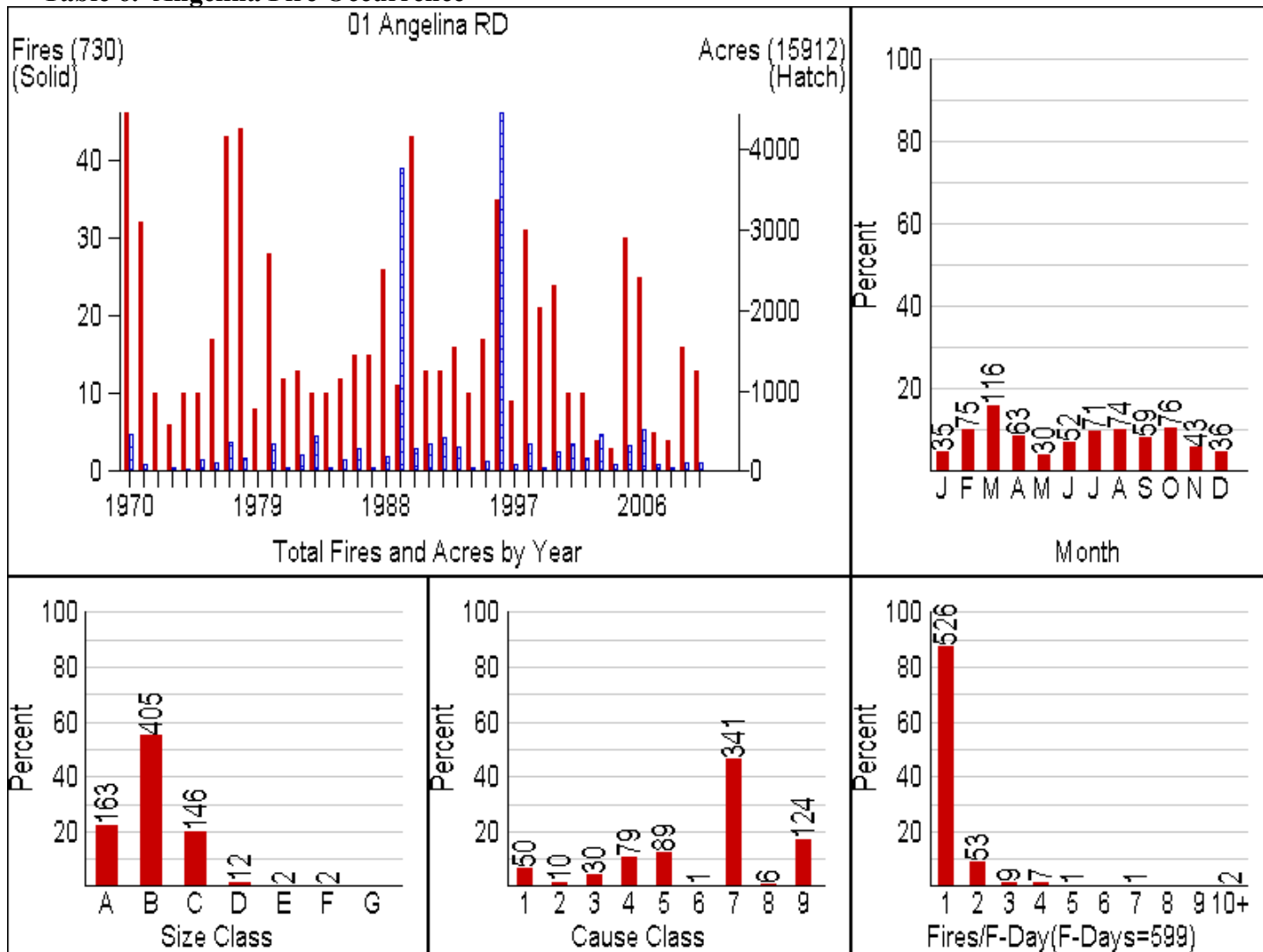


Figure 3: Map showing Fuel Model Distribution on the Angelina FMU

Historical Wildfire Fire Occurrence

The Angelina FMU had 730 fires between 1970 and the start of 2011. This is an average of 18 wildfires a year. Most of the fires occur in the Spring but fires can occur year round. The largest fire was caused by arson, it was 3,936 acres and occurred on 02/20/96. Most of the fires were arson caused with some limited lightning caused fire. Approximately two fires per year start from lightening.

Table 6. Angelina Fire Occurrence



Size Class A = 0.0 to 0.25 ac; B = 0.26 to 9.9 ac; C = 10.0 to 99.9 ac; D = 100.0 to 299.9 ac; E = 300.0 to 999.9+ ac.

Cause Class: 1 = Lighting, 2 = Equipment, 3 = Smoking, 4 = Campfire, 5 = Debris Burning, 6 = Railroad, 7 = Arson,
8 = Children, 9 = Miscellaneous

3.2.4.2 C Weather

The winter is generally the driest time of the year with the greatest wind event potential and low relative humidity's behind passing storms, though widespread precipitation can also occur. During the spring the potential for windy and dry events diminishes steadily from south to north as the jet stream retreats. Shifts in the jet stream allows warm, moist air masses arising from the Gulf of Mexico to become increasingly dominant. The summer is generally warm to hot and humid with light winds under the Bermuda High influence. Critical drying can occur if the high becomes centered over land and becomes modified. A period of peak tropical cyclone activity begins late in the summer, bringing the potential for windy/dry conditions in advance of any storms followed by copious moisture. The fall brings a continuance of the tropical cyclone season early, then dry air intrusion and the potential wind events return with the southward shift in the jet stream. Moist conditions often persist along the Gulf Coast through fall.

Other climate factors that influence Texas weather include the Mexican High Plain, or Altiplanicie Mexicana. This arid, high-altitude plateau region extends northward from Mexico City nearly to the United States border. Rarely does this air reach ground level in Texas except in the Trans-Pecos region, but it influences the weather throughout the State. When surface winds in Texas are from the south or southeast, winds 10,000 feet above ground are normally from the southwest. Thus, low-level air from the Gulf of Mexico is overlaid with warmer, drier air from the Mexican High Plain. Close to the Mexican border, this warm air 'caps' the humid Gulf air, preventing thunderstorm activity and trapping the humid air close to the ground. As the air masses precede north, particularly during the spring and fall, they progressively move beneath cooler air aloft. While the humid low-level air becomes more unstable, it still cannot convect because of the capping inversion. Eventually, if a frontal system or other disturbance causes larger-scale ascent, the Mexican High Plain air can cool enough to eliminate the cap, suddenly allowing vigorous thunderstorm activity to take place. The combination of the Gulf of Mexico and the Altiplanicie Mexicana makes Texas and the southern Great Plains the worldwide hot spot for severe convection and tornadoes.

The Rocky Mountains also has an impact on the climate in Texas. Arizona, New Mexico, and west Texas form one of two relative gaps in the Rocky Mountain Cordillera; the other is along the United States-Canadian border. Westerly winds often blow through this gap, but the Rockies form a broad barrier to westerlies for the rest of the State. In the eastern half of Texas, the least likely wind direction is from the west. The Rockies also block air from moving across them from the east. In particular, cold air masses that reach the United States from the north cannot easily spread westward and instead are funneled southward parallel to the mountains. Such cold air reaches farther south into Texas and beyond than anywhere else on the continent.

Despite the threat of the rare snow or ice storm, winters in most parts of Texas are mild and pleasant. Sunshine averages at least 45 percent of maximum possible along

the coast. In Houston, the growing season is 300 days long; in Dallas, 235. The latest freeze typically occurs after April 1st, in less than half the State.

May is typically the wettest month of the year and also has a high occurrence of tornados. Summer produces the most equitable distribution of rainfall. Thunderstorms are common in the State, but the departure of the jet stream to the north means that severe thunderstorms are a rarity. Despite the continued rainfall, the high temperatures mean that normal evaporation exceeds precipitation in all areas of the State. Below-normal precipitation can cause significant environmental stress, and the State is most susceptible to drought during summertime as a result. The reduced evaporation from the soil and plants under drought conditions also causes temperatures to be just a little bit warmer, making the situation even worse.

The following was taken from the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center;

http://hurricane.ncdc.noaa.gov/climatenormals/clim60/states/Clim_TX_01.pdf, accessed April 27, 2011.

Table 7: Average Weather readings for East Texas

Lufkin	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation	4.45	3.17	3.53	3.13	5.29	4.18	2.6	3.08	4.08	4.13	4.54	4.44	46.62
Mean Temp	48.6	52.9	59.8	66.2	73.7	79.7	82.6	82.2	77.3	67.7	57.7	50.3	66.6

3.2.1 Fire Management Considerations for Specific Fire Management Units

3.2.1B FMU Snap Shot

- FMU Number: Davy Crockett NF
- Fire Behavior Indicator: BI
- NFDRS Weather Station: Ratcliff, Station ID, 413302
- Nearest Weather Station: Ratcliff, Station ID, 413302
- Acres/Agency: 162,021 acres, USFS
- Predominant Vegetation Types: Southern Rough, pine stands on relatively flat to rolling hills with sandy loams. The understory vegetation is dominated by woody shrubs and subdominant hardwood species. Hardwood bays can also be found throughout the FMU.
- Unit: 31
- IA assets assigned to this FMU: Two type 3 dozers and one type 6 Engine
- Duty Officer: Bobi Stiles DFMO or Robert Manry Acting DAFMO
- IA Dispatch Office: Texas Interagency Coordination Center
- Communities adjacent or within FMU: Ratcliff, Kennard, Groveton, Apple Springs, Centerville, and Weches
-

Options available for management response to wildland fires:

Management Actions allowed in this FMU

The response to wildfires in this FMU includes the full range of suppression strategies. “The suppression response may be confinement, containment, or control.” (NFGT LRMP 1996, pg. 64) Thus initial actions may include size-up, patrolling, monitoring, holding actions, or an aggressive initial attack.

Initial response to fires within the FMU will require an assessment as to what initial action to take. The FMO/IC begins this assessment immediately by evaluating the probable cause and location of the fire relative to the hazards to firefighters/public and the risk to natural resources.

Commensurate with the assessment, initial attack resources are dispatched to a fire under the assumption that the fire is to be managed to meet protection objectives unless directed otherwise. Human caused fires will be suppressed to meet protection objectives that minimize negative consequences with respect to firefighters and public safety.

Fire Managers and Line Officers will use the Wildfire Decision Support System (WFFDS) to guide and document wildfire management decisions. The WFFDS will provide situational assessment, analysis hazards and risk, define implementation actions, and document decisions and rationale for decisions.

- **3.2.2B FMU Guidance**

- This section describes direction specific to the management areas (MAs) on the Davy Crockett NF that coincide with the Davy Crockett FMU. The goals, desired future conditions, objectives, standards and guidelines for the area make up the management area direction. The MAs are identified by number and name. Forest-wide goals, objectives, standards and guidelines, apply to all management areas unless specifically exempted or modified by the management area direction.

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- **Management Area 1: Upland Forest Ecosystems**

- **Desired Conditions**

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Deep Sandy Uplands, and Clayey Uplands LTA's) on the Davy Crockett NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridgetops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas longleaf pines have been replanted to slash pine. These areas will be converted back to the native longleaf pine ecosystems. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switch grass, and Indian grass). Interspersed within this Longleaf Pine Ecosystem is a diverse array of mixed forests on the lower slopes of ridges, extending into the streams. Hardwood bottomlands, drainages, seeps, and bogs will perpetuate subtle to major hydrologic differences in the uplands. Many stream courses will portray characteristics of the mixed forest ecosystem, although frequent fires on the uplands will limit the development of these mixed forest communities to the very wettest and widest riparian areas. Narrow stream courses and wetlands will develop an open aspect similar to the upland communities. These inclusions create transitions that begin with pure longleaf pine, grading to mixed species such as loblolly, shortleaf, and oaks, then gradually transcend into bottomland hardwood areas along larger streams.

For the Northern and Mid-Coastal Plains, Western Transition Coastal and Sandhill Subsections (Sparta Sandhills, and the Clayey Uplands LTA's) on the Davy Crockett NF.

Over this landscape you will view open shortleaf pine forests with a mix of oak and hickory trees situated on hills having deep sandy or red clay soils. Ridge tops and upper slopes of droughty hills will be dominated by the Shortleaf Pine-Little Bluestem Communities. More moderate rolling terrain and side slopes with less droughty, loamy soils will be dominated by the Shortleaf-Oak-Hickory Communities. The understory vegetation on the dryer hilltops is dominated by fire tolerant shrub and perennial grasses (primarily little bluestem). Woody understory species such as yaupon, sumac, and greenbrier are more prevalent on lower slopes and loamy soils. Interspersed within this Shortleaf Pine Ecosystem are mixed loblolly and hardwood forests (on the lower slopes of ridges extending into the streams). Some hardwood bottomlands will provide hydrologic and plant community diversity.

- **Objectives**

This area is managed for regeneration and restoration of the Upland longleaf and shortleaf Forest Communities. Prescribed fires and their effects will be evident on many of the upland areas.

Goals

Provide opportunity for timber production, mineral exploration and development, while maintaining a predominantly natural appearing landscape, clean water, productive soil, little soil erosion, viable populations of wildlife, and habitat for threatened, endangered, or sensitive species of plants and animals.

Standards and Guidelines

Ma-1-31 Utilize prescribed fire to manage the various components of the ecosystems.

- a. Fire frequency will generally range from three to seven years. More frequent burning may be required in certain plant communities, as prescribed by site-specific environmental analysis.
- b. Emphasize growing season burning in habitat that was historically maintained by growing season fires

MA-1-32 Wildfire suppression response may be confinement, containment, or control.

Management Area 2: Red-cockaded Woodpecker (RCW) Emphasis

Desired Conditions

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Deep Sandy Uplands, and Clayey Uplands LTA's) on the Davy Crockett NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridge tops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas the longleaf type had been replanted to slash pine and these areas will be converted back to the native longleaf as soon as possible. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switch grass, and Indian grass). Interspersed within this Longleaf Pine Ecosystem is a diverse array of mixed forests on the lower slopes of ridges, extending into the streams. Hardwood bottomlands, drainages, seeps, and bogs will perpetuate subtle to major hydrologic differences in the uplands. Many stream courses will portray characteristics of the mixed forest ecosystem, although frequent fires on the uplands will limit the development of these mixed forest communities to the very wettest and widest riparian areas. Narrow stream courses and wetlands will develop an open aspect similar to the upland communities. These inclusions create transitions that begin with pure longleaf pine, grading to mixed species such as loblolly, shortleaf, and oaks, then gradually transcend into bottomland hardwood areas along larger streams.

For the Northern and Mid-Coastal Plains, Western Transition Coastal and Sandhill Subsections (Sparta Sandhills, and the Clayey Uplands LTA's) on the Davy Crockett NF.

Over this landscape you will view open shortleaf pine forests with a mix of oak and hickory trees situated on hills having deep sandy or red clay soils. Ridge tops and upper slopes of droughty hills will be dominated by the Shortleaf Pine-Little Bluestem Communities. More moderate rolling terrain and side slopes with less droughty, loamy soils will be dominated by the Shortleaf-

Oak-Hickory Communities. The understory vegetation on the dryer hilltops is dominated by fire tolerant shrub and perennial grasses (primarily little bluestem). Woody understory species such as yaupon, sumac, and greenbrier are more prevalent on lower slopes and loamy soils. Interspersed within this Shortleaf Pine Ecosystem are mixed loblolly and hardwood forests (on the lower slopes of ridges extending into the streams). Some hardwood bottomlands will provide hydrologic and plant community diversity.

Objective

The long-term population objective for the NFGT is 1,385 active RCW clusters (541 on the Sam Houston, 330 on the Davy Crockett, and 514 active clusters on the Angelina [includes MA-6 Longleaf Ridge] and Sabine National Forests)

Goals

Provide a range of mature pine forest habitats that allow populations of threatened, endangered, or sensitive species dependent on these communities to flourish. Provide the best possible habitat for recovery of RCW populations and sub-populations, while allowing maximum potential for effective dispersal and social interaction of individuals between clusters.

Standards and Guidelines

MA-2-21 Utilize prescribed fire to control midstory, promote open upland forest communities, and to reduce fire hazard.

- a. Specific frequency, season, and prescription for burning in any area may vary depending upon vegetation, site and weather conditions, and RCW management priorities.
- b. Burn cycles should control encroaching vegetation while minimizing risk to cavity trees
- c. Cavity trees will be protected during burning operations
- d. Plow lanes will not be constructed within 200 feet of cavity trees unless needed to protect the cavity trees during an emergency.
- e. Emphasis is on growing season burning in habitat that was historically maintained by growing season fires

MA-2-22 Wildfire suppression response may be confinement, containment, or control with the primary objective of protecting RCW cavity trees.

MA-2-80-3.2.3 Prescribed burning on a two to five year rotation is the preferred method to control midstory vegetation. In stands with dense, but small (less than two inches diameter) hardwood midstory more frequent burning may be necessary to achieve control.

In clusters, replacement or recruitment stands where hardwood midstory is too large to be killed by prescribed burning (greater than two inches diameter), the following methods may be used to remove midstory.

Mechanical methods such as a feller-buncher, hydro-ax, drum chopper, mulcher, shearing blade, etc.

Manual methods such as chainsaws, brush hooks, etc.

Herbicides applied by injection, hypo-hatchet, hand sprayer, etc.

Or a combination of these methods.

Maintenance burns for clusters, replacement and recruitment stands, which have already had the midstory removed, will receive priority.

Emphasize growing season burns in those habitats that were naturally maintained by growing season fire. After midstory is controlled and the native herbaceous vegetation re-established, burn during other seasons.

MA-2-80-3.3.3 Cavity Tree Protection During Prescribed Burning Operations

Burning prescriptions and cycles must minimize risk to cavity trees.

Cavity trees must be protected by raking away or back burning adjacent fuels, use of fire retardants, etc.

Plow lines will be kept 200 or more feet from cavity trees unless an emergency or site specific circumstance such as location of a property boundary, etc , dictate the need to locate them closer. If conditions dictate plow lines be placed within 200 feet of cavity trees, use of a dozer blade to lightly scrape away fuels is preferable to using a deep cutting plow.

MA-2-80-4.4 Prescribed Burning (Management in HMA)

Outside clusters, replacement and recruitment stands: the objective is midstory reduction (not total elimination) using primarily prescribed burning.

Establish a burning cycle of two to five years HMA-wide. In stands where fire has been excluded for many years, annual burning may be necessary to significantly reduce midstory.

Emphasize use of growing season burns in ecologically appropriate areas. Recognize, however, that habitat goals may require burning whenever conditions permit.

All burning prescriptions will be based on site specific conditions, including vegetation, site and weather conditions, and RCW management problems.

Use natural firebreaks (streams, roads, swamps, etc.) whenever possible to reduce impacts of constructing firelines.

Management Area 4 Streamside Management Zones

-
- **Desired Conditions**
 - The NFGT has approximately 49,800 acres in this management area and includes the bed, bank, and water resources of the rivers, perennial and intermittent streams, wetlands, and their adjacent land areas. This Management Area also includes shorelines of perennial water bodies and areas adjacent to these shorelines. This area occurs in all ecological units on the National Forests and Grasslands in Texas (NFGT), but is sometimes described as riparian and bottomlands land LTA. Throughout this management area you will see some of the most diverse and productive areas on the Forest. This management area provides contiguous and diverse habitat for riparian and wetland dependent species. Stream channels will remain stable providing suitable water quality. Limited manipulation of vegetation will filter sediment, thus maintaining aquatic habitat for those dependant species. Vegetation left within the management area will provide a continuous source of organic matter, which contributes to the soil building process. The desired future condition of vegetation groups will be described within these stream course definitions.
-
- **Rivers, Sloughs and Swamplands.** Baldcypress-Water Tupelo Series is a deciduous swamp forest that occupies some hydric soils in East Texas. Bald cypress and/or tupelo gum tend to dominate, but composition will depend on water depth, duration of flooding, and disturbance. This community is often dense canopied, dominated by Bald Cypress and Water Tupelo with some red maple, ash, water locust, and swamp black gum. Standing water is present for much of the year.
-
- **Perennial Streams with Floodplain Forest.** Floodplain forest will most typically occur in well defined terraces along rivers and larger streams of the Forest and Caddo National Grassland. Floodplain Forest include the more hdyric **Overcup Oak Series**, the traditional **Water Oak-Willow Oak Series**, and the well-drained **Swamp Chestnut Oak-Willow Oak Series**. Red maple, water hickory, and willow oak are usually intermixed in the **Overcup Oak** community. Sweetgum, cherrybark oak, ash, and overcup oak with ironwood, eastern hophornbeam, deciduous holly, and Florida maple in the understory can be found in **Water Oak-Willow Oak Series**. Sweetgum, overcup oak, and cherrybark oak in the overstory with dwarf palmetto in the understory can be found in the **Swamp Chestnut Oak-Willow Oak Series**.
-
- **Floodplain Forest Intermittent Streams.** Intermittent streams in both Forest and Grassland landscapes will develop on well drained streamcourses. These streamside zones may be difficult to distinguish from the adjacent upland areas due to a vegetation mix of species, especially if the surrounding uplands are oak-hickory or oak-pine type. The floodplain and topographical situation will help define this area, and in the more mesic intermittent streams, species from the periodically flooded perennial streams or **Floodplain Forest** areas may occur.
-

- **Mesic Forest Intermittent Streams.** Intermittent Streams developed on side slopes and areas between uplands and stream bottoms. Desired natural condition will be a multi-aged forest with many large-sized individuals. There is usually a rich assemblage of lichens, mosses and liverworts on soil, fallen logs, stumps, shrubs, and trees.

-

- **Inclusional Wetlands.** These inclusional communities will be associated with the longleaf pine landscape of the Mayflower and Sandy Uplands LTA. Composition in Sweetbay Magnolia Series; include gallberry holly, black titi, waxmyrtle, red maple, button bush, swamp gum, laurel greenbriar, and possumhaw viburnum. These sites are often associated with the Sphagnum-Beakrush Series (bogs). At times referred to as “baygall”, these areas could form a dense evergreen shrub thicket.

- **Objectives**

- This area will be managed to provide diverse stands of hardwoods and some pines, with a wide variety of understory vegetation. The water bodies such as lakes, perennial wetlands and associated areas contribute to the diversity and dispersion of native animals and plants with in each drainage, these drainages connect to the larger watersheds found throughout the NFGT. These linkages provide dispersal for populations of fish, wildlife and plants. This Management area will be managed to meet the recommendations in the Texas Wetlands Plan (TPWD 1988) and Best Management Practices (BMP) established by the state.

Primary objectives to manage for:

- * Maintenance of high quality water and abatement of downstream flooding.

- * Enhancement of all associated resources.

- * Protection of aquatic, riparian habitat, and special plant communities.

Secondary objectives to manage for:

- * Dispersion for animal and plant species by maintaining connecting habitat among mature and old growth stands of trees,

- * Maintenance or improvement of mast-producing wildlife habitat,

- * Recreation and scenic use compatible with other riparian management objectives, and,

- * Special wildlife habitat needs such as for threatened and endangered species, raptor nests and perches, and nests/dens for cavity dependent species.

The actual streamside riparian management area boundaries shall be identified as an Intermittent Stream or Perennial Stream. Determination of those classifications shall be by an onsite reconnaissance of topographic and biotic features, or as determined by the Forest Soil Scientist, Botanist or Hydrologist during site-specific environmental analysis.

A Primary Zone and a Secondary Zone will be identified within the Stream Side Management Zone (SMZ). The primary zone will be a 50-foot protection zone to ensure primary objectives of the area are achieved. This primary zone will extend from the stream channel edge outward 50 feet on either side of the stream. The secondary zone will be delineated from the primary zone outward to the extent of the SMZ to achieve objectives of this zone. The outer edge of the SMZ will vary depending on both biological and physical factors within the LTA, historical use and topographical position.

Standards and Guides

MA-4-31 Prescribed fire may be used to enhance riparian vegetation or wildlife habitat.

- a. Encourage the use of green lines, wet lines, or foam lines rather than plowed firelines. Minimize the amount of plowed fireline which might impair the hydrology of the riparian ecosystems. Generally plowed firelines will not be allowed within the primary zone.
- b. Prescribed fire will generally not be used in large riparian areas.
- c. Low intensity backing fires may be used in smaller streamside zones.
- d. Fire maintained wetlands, baygalls, and bogs should be burned frequently to meet the desired future condition.

MA-4-32 The appropriate wildfire suppression response may be confinement, containment, or control.

Management Area 7 Wilderness

The Big Slough Wilderness is found on the Davy Crockett NF.

Desired Condition

Lands within this management area are administered to maintain or achieve a natural state. The area is generally maintained in a natural condition by allowing physical and biological processes to operate without human intervention. Activities are integrated in such a way that current human use leaves only limited and site-specific evidence.

Within wildernesses, the enduring resource of wilderness is maintained and perpetuated as one of the multiple uses of National Forest System land. Wilderness character and public values are protected and perpetuated including, but not limited to, opportunities for scientific study, solitude, education, physical challenge and stimulation, inspiration, and primitive recreation experiences.

The vegetation is primarily the result of natural succession and processes. Ecosystems are relatively unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces. The forest cover retains the primeval character of the environment.

Goals and Objectives

Restore fire to its natural, ecological role. Reduce the risks and consequences of wildfire within wilderness or escaping from wilderness. Preserve wilderness character and associated values. Provide for human safety.

Standards and Guides

MA-7-41 Fires should be prevented from threatening or causing damage to human life and adjacent non-wilderness property.

MA-7-42 Fires are managed in accordance with an approved Fire Management Plan for each wilderness.

MA-7-43 Prescribed fire may be used to manage wilderness as determined through site specific environmental analysis. Prescribed fire plans should address:

- a. The role of natural fire in fire dependent or related ecosystems, and
- b. Fuel loadings which are a fire risk to resources and values outside the wilderness.

MA-7-44 Favor suppression methods and equipment that cause the:

- Least alteration of the wilderness landscape;
- Least disturbance of the land surface;
- Least disturbance to visitor solitude;
- Least reduction of visibility during periods of visitor use; and,
- Least effects on other air quality-related values.

MA-7-45 Mechanical equipment may be used in wildfire suppression in accordance with Forest Service Manual direction.

MA-7-46 Firelines shall be rehabilitated as soon as possible after controlling wildfires.

MA-7-47 A prescribed fire action plan for each wilderness will identify the specific areas where prescribed fire can be applied to reduce fuel loading so that outside resources may be protected and maintain a fuel level that would allow fire to play its natural role.

Management Area 8b Protected River and Stream Corridors

Naches River Corridor found on the Davy Crockett NF

Desired Conditions

A one-quarter mile corridor from each side of the rivers and any lands visible from them under Forest Service management exist in a natural to near-natural setting, and the rivers and channels are not modified in anyway.

Objectives

Management practices are designed so that the natural landscape appears unaltered.

Goals

- * Prevent modification of the free flowing characteristics of the identified rivers;
- * Protect, and to the extent practicable, enhance the outstandingly remarkable values of the identified river(s);
- * Preserve the eligibility and potential classification of the identified rivers.

These goals will be achieved through the following management related objectives:

- * Maintain a one-quarter mile corridor on each side of the river of high quality scenery and an essentially undeveloped shoreline;
- * Maintain and improve fish and wildlife habitat;
- * Provide opportunities for river-oriented recreation which are consistent with the largely undeveloped nature of the segment and dependent on free-flowing conditions;
- * Utilize other resources and permit other activities which maintain or enhance the wildlife habitat quality, river fisheries, scenic attractions, or recreation values.

Standards and Guides

MA-8b-31 Use prescribed fire for vegetative manipulation where necessary in fire dependent ecosystems to maintain or enhance desired conditions.

MA-8B-32 Suppression strategies, practices, and activities are limited to those which have minimal effects on scenic river values.

MA-8b-33 Suppress wildfires at the lowest acreage practicable. Prescribed natural fires may be allowed to burn within prescription in fire dependent ecosystems.

Management Area 8d Natural Heritage Areas

List of Natural areas on the Davy Crockett NF

Crested Coralroot	6 acres	Landtype Association, Sparta Sandhills
Neches Bluff	4 acres	Landtype Association, Sparta Sandhills

Desired Conditions

Emphasize relict plant populations and plant communities, especially the mesic hardwood types.

Objectives

Enhance, and promote sustainable populations of unique plants or plant communities.

Goals

In these areas, the natural disturbance effects of fire, weather, and erosive action should be allowed to work unimpeded. “Allow frequent fire return intervals to enhance the species composition of fire maintained communities. Fires should be allowed to burn throughout the area and not be limited to specific sites to allow natural plant community variability and ecotones to reestablish.” (NFGT LRMP 1996, pg. 233)

Standards and Guides

MA-8d-31 Limit suppression strategies, practices, and activities to those which have minimal impacts to botanical values. Extinguish wildfires endangering the area.

MA-8d-32 Use prescribed fire to manage or maintain the botanical character and successional stages for which the area has been designated unless restricted in certain plant communities as defined in specific botanical areas.

MA-8d-33 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of the area.

Leave fire-caused debris for natural decay

Management Area 8f Cultural Heritage Areas

Description

Cochino Bayou Archeological Area (270 acres) on the Davy Crockett NF
Archeological and Historic Areas - A unit of land possessing features, sites, or a concentration of sites, buildings, structures, or objects united historically or prehistorically by plan or physical development, and which have been determined to be significant to our understanding of the prehistoric and historic occupation and utilization of the lands in which they are located.

Desired Condition

The historical integrity of the sites are maintained so that the scientific and educational values are retained.

Objective

Not Stated

Goals

Not Stated

Standards and Guides

MA-8f-31 Manage fire and fuels through suppression practices, management of ignited prescribed fire, and vegetation manipulation to protect the values for which the area is designated or to maintain and/or restore natural conditions.

MA-8f-32 Accomplish fire suppression and fuels management without the use of heavy equipment or fire plows in those areas where their use would endanger the historical or contextual integrity of site feature or cultural deposits.

Management Area 9a Developed Recreation Sites

On the Davy Crockett NF the developed Recreation Sites are: Ratcliff Lake and Kickcapoo picnic site.

Desired Condition

Areas and sites developed with recreational user facilities to enhance camping, picnicking, swimming, boating, and fishing for National Forest visitors Interpretation and enjoyment of using the Forest and Grassland environments are emphasized.

Objectives

Facilities will be as natural, simple, and unobtrusive as possible. When possible, management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals.

- * Provide a safe, healthful, aesthetic, and non-urban atmosphere for the pursuit of natural resource based recreation.
- * Provide facilities and improvement at an appropriate level of accessibility, consistent with resource protection needs and anticipated user demand.
- * Provide opportunities for meaningful recreation experiences consistent with user demand and expectation.

Standards and Guides

MA-9a-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9a-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

MA-9a-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 9b Minimally Developed Recreation Sites

Desired Conditions

Most areas have a low development scale with few amenities provided. These areas provide a wide spectrum of forest and rangeland settings offering a range of recreation opportunities.

Objective

Facilities will be as natural, simple, and unobtrusive as possible, when possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals

- *Provide facilities and improvements, consistent with resource protection needs, anticipated user demand, and compatible with management goals for the surrounding area, to support specialized and dispersed recreation use on the Forest and,
- * Provide a safe, healthful, aesthetic atmosphere for the pursuit of natural, resource based recreation.

Standards and Guides

MA-9b-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9b-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

Ma-9b-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 10b Special Use Permit Sites: Examples utility corridors

Desired Condition

The desired future condition is a pattern of special uses established to provide facilities, services, or opportunities that are in the general public interest.

Objective

When feasible, special uses are combined in a single corridor rather than developing parallel corridors.

Goals

- * Provide safe efficient facilities and improvements in an environmentally sensitive manner.
- * Authorize only those occupancies which promote and support the general public welfare, and do not conflict with law and Forest Service policy.
- * Minimize inconsistency with surrounding land uses and minimize the adverse impacts of these uses on other resources.

Standards and Guides

See Forest Wide

3.2.3B FMU Characteristics

3.2.3.1B Safety

- **Flora and Fauna:** Texas is home to numerous plants and animals that could pose a safety risk to firefighters; the list includes poisonous snakes, wasps, biting insects (ticks and chiggers), and poison ivy to name just a few. The southern rough fuel

type present in Texas is called the “Big Thicket” for a reason. Numerous thorny vines and briars are present in Texas and can make cross country travel difficult.

- **Snags:** Texas has been hit by several wind events and hurricanes over the last 10 to 15 years which has produced numerous snags that could pose a threat to firefighters and the general public and make fires harder to contain.
- **Environmental Conditions:** Texas is known for long, hot, humid, summer months that can lead to illness caused by overheating. During its short winter season Texas can also experience periods of freezing temperatures and the occasional ice storm or snow storm.

3.2.2.2B Physical

- The FMU is located approximately 35 miles west of Lufkin, TX, and 20 miles east of Crockett, TX, near the towns of Kennard, Ratcliff, and Apple Springs. The FMU boundary coincides with the Davy Crockett NF proclamation boundary.
- Topography: The topography is flat to gently rolling. The average slopes ranges from 0 to 5% though in some cases slopes can be as steep as 15 to 30%.
- Elevations ranges from 150 to 495 feet above sea level.

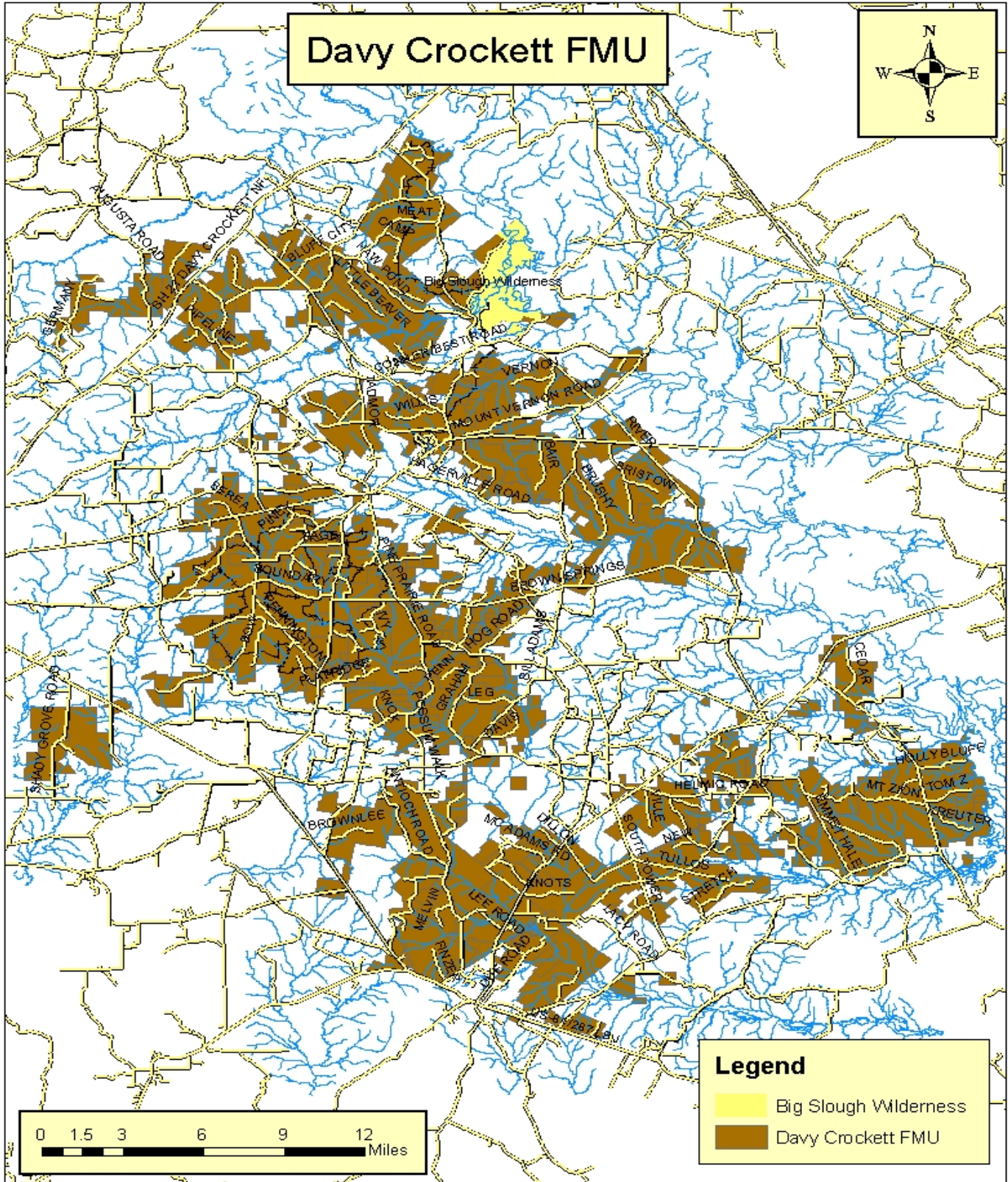


Figure 1: Davy Crockett FMU

3.2.3.3B Biological

Ecological Systems

Table 1 list the landtype phases or ecological classification system classifications found on the Davy Crockett FMU. An ecological classification system classifies land into ecologically equivalent units on the basis of an integration of multiple components of the forest ecosystem including soils, physiography, and vegetation. A land classification based on these components reflects the influence of environmental characteristics of a site, and gives information about its inherent ecological potential and types of living communities it will support.

Desired Ecological Systems for the Davy Crockett FMU

Table 1: Approximate Acres for Landtype Phases

Landtype Phases	Approximate Acres
American Beech-White Oak/Mitchella Loamy Moist-Mesic Steep Slopes and Ravines	1,898
Baldcypress/Ceratophyllum Semi-Permanently Flooded Swamps	449
Overcup Oak/Justicia Clayey/Loamy Seasonally to near Regularly Flooded Low River Floodplains	3,366
Shortleaf Pine (Longleaf Pine)-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	11,313
Shortleaf Pine-(Longleaf Pine)-Blackjack Oak/Schizachyrium Arenic Dry Uplands	53
Shortleaf Pine-Blackjack Oak/Schizachyrium Arenic Dry Uplands	5,330
Shortleaf Pine-Bluejack Oak/Tragia Grossarenic Dry Uplands	142
Shortleaf Pine-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	144,300
Shortleaf Pine-Post Oak/Chasmanthium Clayey Dry-Mesic Uplands	334
Small Stream and Riparian	4,126
Temporarily Flooded Bottomland	12,305
White Oak-Loblolly Pine/Callicarpa Loamy Mesic Lower Slopes and Terraces	873

3.2.2.4. B Resources (Wildland Urban Interface, Special Areas, and Recreation Resources)

- **Wildland Urban Interface**

The Davy Crockett FMU has extensive urban interface. It is broken up into numerous blocks that are surrounded by houses and associated private development.

- **Special Designations**

Table 2: Special Areas

Areas with Special Designation within FMU	Acres
Crested Coralroot	6
Cochino Bayou Archeological Area	270
Neches Bluff	6
Big Slough Wilderness	3,539

- **Recreation**
 Trail System
 Camping
 Picnic

Table 3: List of Recreation areas on the Davy Crockett FMU

Name	Type		Name	Type
Piney Creek Horse Camp	Horse Camp		Kickapoo	Picnic Site
Piney Creek Horse Camp	Horse Camp		Neches Bluff Overlook	Trailhead

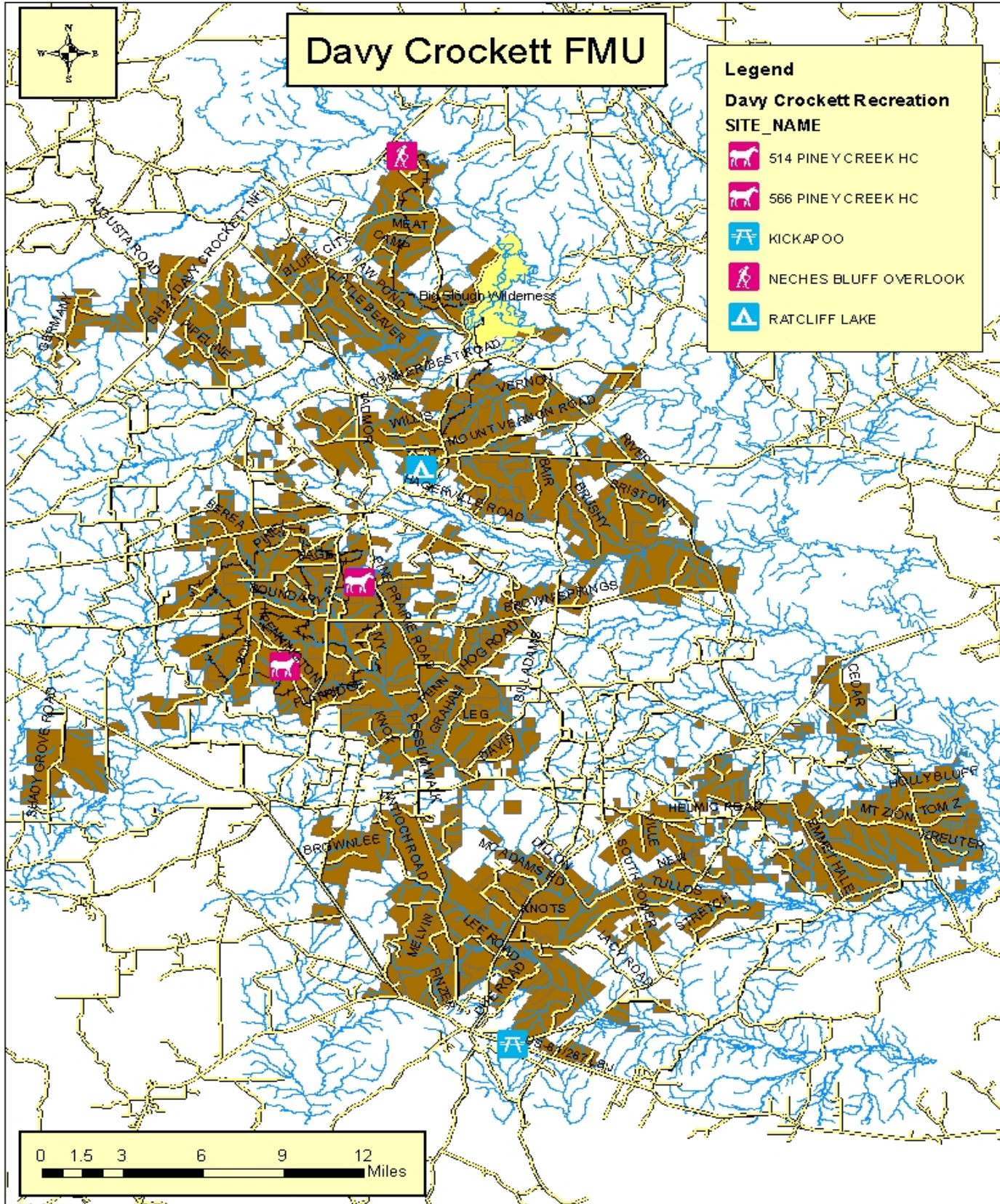


Figure 2: Davy Crockett FMU Recreation Sites.

3.2.4.B FMU Fire Environment

The Davy Crockett has an aggressive prescribed burn program, up to 25 percent is on a 2-5 year burn rotation. The District personnel prescribe burn 25,000 to 40,000 acres a year. Extensive areas of fire dependent upland pines habitat can be found, noticeably in conjunction with RCW management areas. In areas that have not been treated with fire for several years, a build up of fuels has developed that includes volatile plant components and ladder fuels that can lead to more extreme fire behavior under certain conditions.

3.2.4.1B Fire Behavior

The following Fuel Models are found on the Davy Crockett NF.

Table 5: Fuel Models Present on the Davy Crockett FMU (Source; Landfire)

Fuel Model With approximate acres	Fire Behavior Notes
GR3 1122 acres	Primary carrier is grass, very little shrubs present. Average depth 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GR5 241 acres	Dense short grass, very little shrubs present. Average depth 1 to 2 feet. Spread rate can be high (twice as much as GR3) as can flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GS3 805 acres	A mixture of grass and shrubs. Moderate fuel loading, average depth less than 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Can have higher flame lengths as compared to GR3. Moisture of extinction is 30 to 40 percent. Found in areas that have been treated repeatedly with fire. Typically has a pine or hardwood overstory.
SH3 18900 acres	Pine overstory with a shrub understory, moderated fuel load, average depth 2 to 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent.
SH4 27838 acres	Pine overstory with a shrub understory, low fuel load, average depth 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent. When live herbaceous is fully cured can have a very high rate of spread much higher than SH3 and moderate flame length.

TL2 25081 acres	Pine overstory with a compact leaf litter, low fuel load, average depth 1 to 2 inches. Typical of a one year old rough. Spread rate low flame length low. Moisture of extinction is 25 percent.
TL6 198103 acres	Pine overstory with a moderate fuel load, average depth 2 to 4 inches. Spread rate moderate . Moisture of extinction is 25 percent.
TU3 5321 acres	Pine or Oak Savanna with a moderate forest litter load and grass and shrub components. Spread rate is high, flame length is moderate. Moisture of extinction is 30 percent.

The map below depict the location of the fuel models.

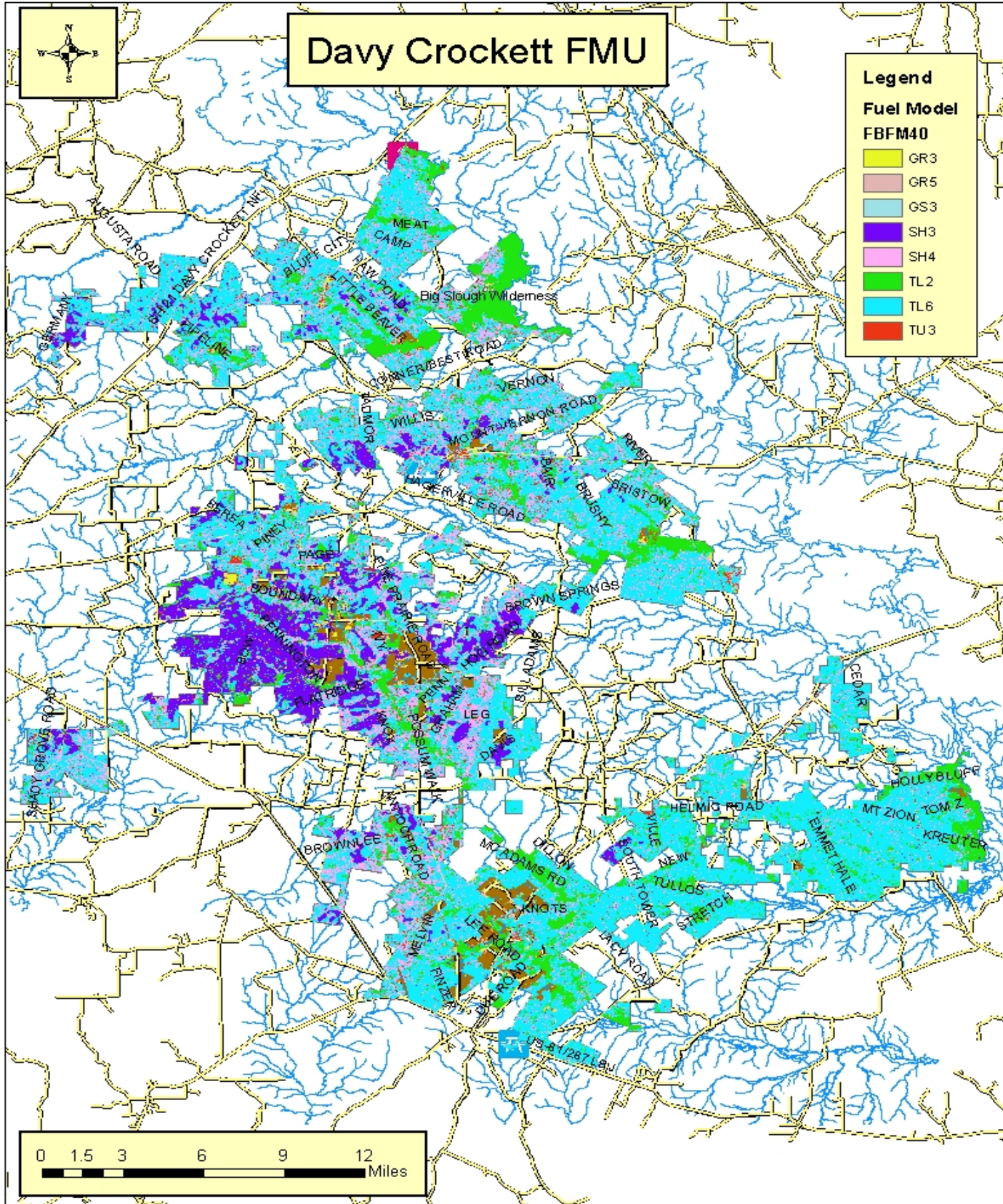
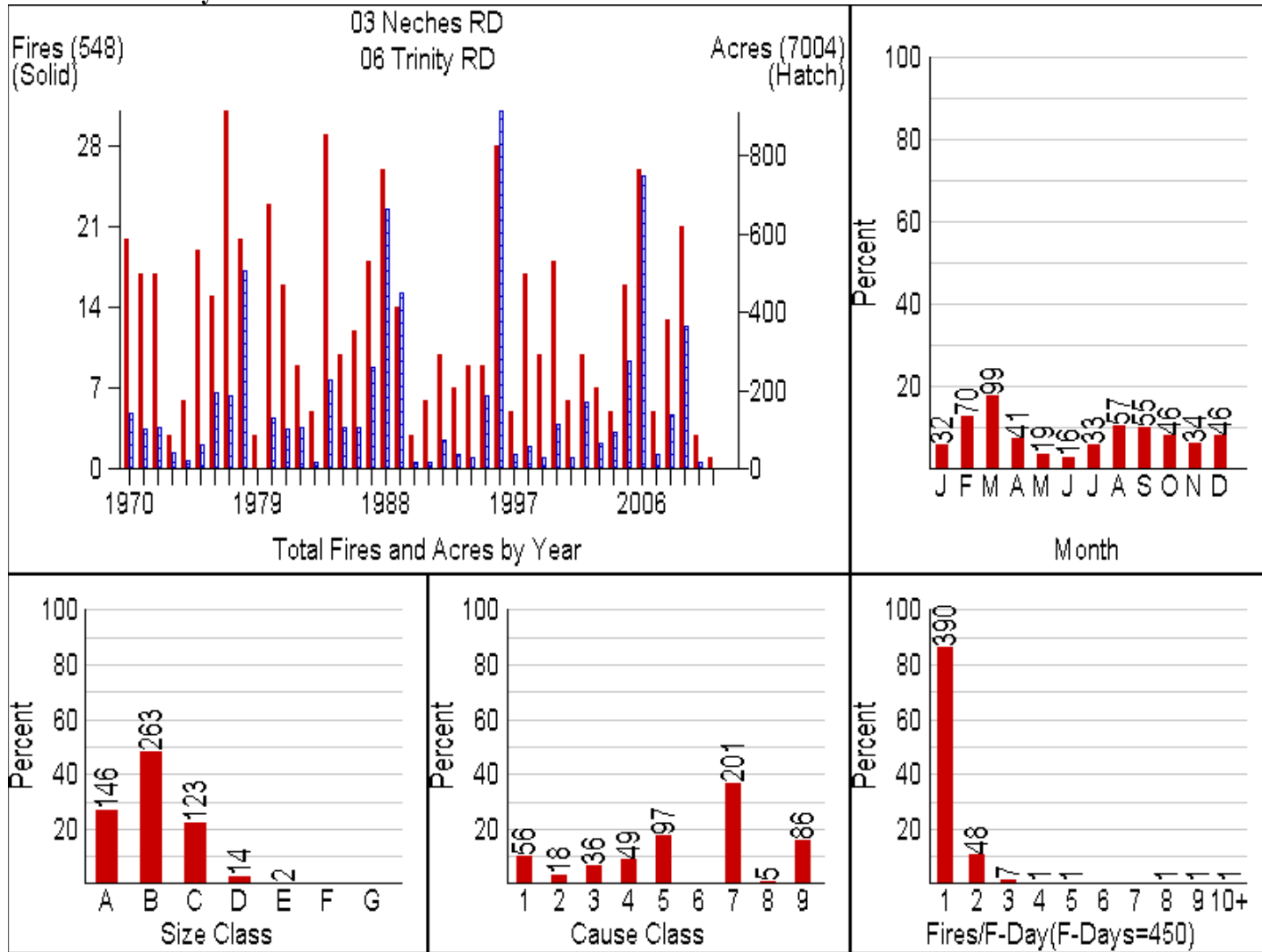


Figure 3: Map showing Fuel Model Distribution on the Davy Crockett FMU

Historical Wildfire Fire Occurrence

The Davy Crockett FMU (formally the Neches and Trinity Ranger Districts) had 548 fires between 1970 and the start of 2011. This is an average of 13 to 14 wildfires a year. Most of the fires occur in the Spring but fires can occur year round. The largest fire was 306 acres which occurred on 3/08/2006. Most of the fires were arson caused with some limited lightning caused fire. Approximately one fire per year started from lightening.

Table 6. Davy Crockett Fire Occurrence



Size Class A = 0.0 to 0.25 ac; B = 0.26 to 9.9 ac; C = 10.0 to 99.9 ac; D = 100.0 to 299.9 ac; E = 300.0 to 999.9+ ac.

Cause Class: 1 = Lighting, 2 = Equipment, 3 = Smoking, 4 = Campfire, 5 = Debris Burning, 6 = Railroad, 7 = Arson, 8 = Children, 9 = Miscellaneous

3.2.4.2 B Weather

The winter is generally the driest time of the year with the greatest wind event potential and low relative humidity's behind passing storms, though widespread precipitation can also occur. During the spring the potential for windy and dry events diminishes steadily from south to north as the jet stream retreats. Shifts in the jet stream allows warm, moist air masses arising from the Gulf of Mexico to become increasingly dominant. The summer is generally warm to hot and humid with light winds under the Bermuda High influence. Critical drying can occur if the high becomes centered over land and becomes modified. A period of peak tropical cyclone activity begins late in the summer, bringing the potential for windy/dry conditions in advance of any storms followed by copious moisture. The fall brings a continuance of the tropical cyclone season early, then dry air intrusion and the potential wind events return with the southward shift in the jet stream. Moist conditions often persist along the Gulf Coast through fall.

Other climate factors that influence Texas weather include the Mexican High Plain, or Altiplanicie Mexicana. This arid, high-altitude plateau region extends northward from Mexico City nearly to the United States border. Rarely does this air reach ground level in Texas except in the Trans-Pecos region, but it influences the weather throughout the State. When surface winds in Texas are from the south or southeast, winds 10,000 feet above ground are normally from the southwest. Thus, low-level air from the Gulf of Mexico is overlaid with warmer, drier air from the Mexican High Plain. Close to the Mexican border, this warm air 'caps' the humid Gulf air, preventing thunderstorm activity and trapping the humid air close to the ground. As the air masses precede north, particularly during the spring and fall, they progressively move beneath cooler air aloft. While the humid low-level air becomes more unstable, it still cannot convect because of the capping inversion. Eventually, if a frontal system or other disturbance causes larger-scale ascent, the Mexican High Plain air can cool enough to eliminate the cap, suddenly allowing vigorous thunderstorm activity to take place. The combination of the Gulf of Mexico and the Altiplanicie Mexicana makes Texas and the southern Great Plains the worldwide hot spot for severe convection and tornadoes.

The Rocky Mountains also has an impact on the climate in Texas. Arizona, New Mexico, and west Texas form one of two relative gaps in the Rocky Mountain Cordillera; the other is along the United States-Canadian border. Westerly winds often blow through this gap, but the Rockies form a broad barrier to westerlies for the rest of the State. In the eastern half of Texas, the least likely wind direction is from the west. The Rockies also block air from moving across them from the east. In particular, cold air masses that reach the United States from the north cannot easily spread westward and instead are funneled southward parallel to the mountains. Such cold air reaches farther south into Texas and beyond than anywhere else on the continent.

Despite the threat of the rare snow or ice storm, winters in most parts of Texas are mild and pleasant. Sunshine averages at least 45 percent of maximum possible along the coast. In Houston, the growing season is 300 days long; in Dallas, 235. The latest freeze typically occur after April 1st, in less than half the State.

May is typically the wettest month of the year and also has a high occurrence of tornados. Summer produces the most equitable distribution of rainfall.

Thunderstorms are common in the State, but the departure of the jet stream to the north means that severe thunderstorms are a rarity. Despite the continued rainfall, the high temperatures mean that normal evaporation exceeds precipitation in all areas of the State. Below-normal precipitation can cause significant environmental stress, and the State is most susceptible to drought during summertime as a result. The reduced evaporation from the soil and plants under drought conditions also causes temperatures to be just a little bit warmer, making the situation even worse.

The following was taken from the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center;

http://hurricane.ncdc.noaa.gov/climatenormals/clim60/states/Clim_TX_01.pdf, accessed April 27, 2011.

Table 7: Average Weather readings for East Texas

Lufkin	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation	4.45	3.17	3.53	3.13	5.29	4.18	2.6	3.08	4.08	4.13	4.54	4.44	46.62
Mean Temp	48.6	52.9	59.8	66.2	73.7	79.7	82.6	82.2	77.3	67.7	57.7	50.3	66.6

3.2.1 Fire Management Considerations for Specific Fire Management Units

3.2.1E FMU Snap Shot

- FMU Number: Lyndon B. Johnson (LBJ) and Caddo National Grasslands
- Fire Behavior Indicator: BI
- NFDRS Weather Station: Lyndon B. Johnson, Station ID. 419601 and Caddo, Station ID. 410202
- Nearest Weather Station: Lyndon B. Johnson, Station ID. 419601 and Caddo, Station ID. 410202
- Acres/Agency: 38,100 acres, LBJ and Caddo National Grassland
- Predominant Vegetation Types: The Caddo and LBJ were severely eroded, abandoned farms and ranches that the Federal Government acquired in the late 1930's. The Caddo and LBJ National Grasslands have a mix of bottomland hardwoods (10 percent), prairie - savanna woodlands (25-35 percent), and prairie grasslands (50-60 percent). Little bluestem (midgrass) is the dominant grass in communities, co-associated with big bluestem and Indian grass (tall grasses). The Ladonia Unit of the Caddo Grasslands, as well as small areas on the LBJ falls within the Blackland or true Tallgrass Prairie. The soils of the Blackland Prairie are mostly dark calcareous clays derived from the underlying clay, marl, shale, chalky limestone, and other bedrock. Low permeability of Blackland clay soils has inhibited tree growth, except along the many stream courses. The savanna or parkland habitat seems more characteristic of the western area or LBJ, while the savannah and forest are more characteristic of the eastern Caddo unit. Differential erosion has produced rolling and hilly topography, and the landscape is more broken to the west. In many upland areas, however, overgrazing and cultivation have led to severe erosion and siltation thus, many portions of low lying floodplains also have a mantle of recent (post-1850) alluvium. This FMU is found within Oak Woods, Prairie, and Blackland Ecological Regions as described by the Texas Natural Heritage Program (TNHP), an area typified by native tallgrass prairie and oak woodlands. Within this area, U.S. Forest Service (USFS) specialists have defined several ecological sub-regions which describe the region's unique physical and biological characteristics. This Ecological Classification System (ECS) describes grassland and woodland ecosystems lying within the Grand Prairie, Eastern and Western Crosstimbers, and Blackland Prairie ECS sub-sections. The area consists of ponds, streams, prairie, woodland-savanna, and bottomland hardwood habitats within the north Texas area.
- Unit: 83
- IA assets assigned to this FMU: 1 Type-6 Engine, 1 Type-7 Engine and VFD's
- Duty Officer: Scott Fry DFMO or Shane Beavers FPT
- IA Dispatch Office: TICC, Wise and Fannin Counties
- Communities adjacent or within FMU: LBJ: Decatur, Alvord, Sunset, Greenwood, Chico. Caddo: Ladonia, Telephone, Sells, Lamasco, Duplex, Bettis, Monkstown.
- LMP Options available for response to ignition:

Management Actions allowed in this FMU

The response to wildfires in this FMU includes the full range of suppression strategies. “The suppression response may be confinement, containment, or control.” (NFGT LRMP 1996, pg. 64) Thus initial actions may include size-up, patrolling, monitoring, holding actions, or an aggressive initial attack.

Initial response to fires within the FMU will require an assessment as to what initial action to take. The FMO/IC begins this assessment immediately by evaluating the probable cause and location of the fire relative to the hazards to firefighters/public and the risk to natural resources.

Commensurate with the assessment, initial attack resources are dispatched to a fire under the assumption that the fire is to be managed to meet protection objectives unless directed otherwise. Human caused fires will be suppressed to meet protection objectives that minimize negative consequences with respect to firefighters and public safety.

Fire Managers and Line Officers will use the Wildfire Decision Support System (WFFDS) to guide and document wildfire management decisions. The WFFDS will provide situational assessment, analyze hazards and risks, define implementation actions, and document decisions and the rationale for decisions.

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- **3.2.2E FMU Guidance**

- This section describes direction specific to the management areas (MAs) on the LBJ and Caddo National Grasslands that coincide with the LBJ and Caddo FMU. The goals, desired future conditions, objectives, standards and guidelines for the area make up the management area direction. The MAs are identified by number and name. Forest-wide goals, objectives, and standards and guidelines apply to all management areas unless specifically exempted or modified by the management area direction.

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- **Management Area 3: Grassland Ecosystems**

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- **Desired Conditions**

- Most of the area will be viewed as a grassland landscape interspersed with woodland savannahs on uplands with forested woodlands occupying bottomlands and drainages. Grasslands will occupy at least 60 percent of the area. Existing bottomland hardwoods and woodlands lining streams and lakes will provide wildlife habitat and soil and water protection. Brush or short, woody vegetation will be dispersed cross the prairie, providing wildlife habitat and vegetative diversity. Both native and long-established desirable non-native plant communities will exist, however, these areas will slowly revert to the native perennial grasses.

-

- **Objectives**

- Management practices will be implemented to maintain and improve ecological range conditions. This area is managed emphasizing recreation and wildlife habitat, range management, and dispersed recreation. The area is managed to provide wildlife habitat for consumptively utilized native wildlife, and other types of dispersed recreation opportunities while allowing environmentally sensitive commodity production.

-
- **Goals**
- Provide opportunity for grazing and other environmentally sensitive commodity production while maintaining a predominantly natural appearing landscape, clean water, long term soil productivity, viable populations of wildlife, and habitat for threatened, endangered, or sensitive species of plants and animals.

-
- **Standards and Guides.**

MA-3-31 Encourage the establishment of volunteer fire departments within Grassland area communities.

MA-3-32 Utilize volunteer fire departments as initial and attack forces for wildfires on the Grasslands.

MA-3-33 Utilize prescribed fire for forage and wildlife habitat improvement in combination with other treatments.

The treatment cycle is three to five years

MA-3-34 Use prescribed fire cautiously and restrict or exclude where possible its use on areas showing evidence of active erosion.

MA-3-35 Water bar firelines as appropriate, and seed bare earth to minimize erosion.

a. Cool season annual grasses should be used as cover crops to protect firelines constructed for winter burns.

b. Minimum water bar spacing are shown on the Forest-wide Standards and Guidelines (F W-187)

c. Encourage the use of green lines, wet lanes, or foam lines rather than plowed firelines to the extent practicable.

MA-3-56 Conduct mowing, grazing, disking, brushhogging, vegetation manipulation, prescribed burning, spraying, fertilizing, seeding, planting, and vibratilling to achieve the management area goals and the desired future condition.

a. Prescribed burning shall be favored over mowing, brushhogging, or other mechanical treatments.

b. Structural improvements such as fences, ponds and crossings may be developed to achieve area goals and grazing distribution.

Management Area 4 Streamside Management Zones

-

- **Desired Conditions** The NFGT has approximately 49,800 acres in this management area and includes the bed, bank, and water resources of the rivers, perennial and intermittent streams, wetlands, and their adjacent land areas. This Management Area also includes shorelines of perennial water bodies and areas adjacent to these shorelines. This area occurs in all ecological units on the National Forests and Grasslands in Texas (NFGT), but is sometimes described as riparian and bottomlands land LTA. Throughout this management area you will see some of the most diverse and productive areas on the Forest. This management area provides contiguous and diverse habitat for riparian and wetland dependent species. Stream channels will remain stable providing suitable water quality. Limited manipulation of vegetation will filter sediment, thus maintaining aquatic habitat for those dependant species. Vegetation left within the management area will provide a continuous source of organic matter, which contributes to the soil building process. The desired future condition of vegetation groups will be described within these stream course definitions.

-

- **Perennial Streams with Floodplain Forest.** Floodplain forest will most typically occur in well defined terraces along rivers and larger streams of the Forest and Caddo National Grassland. Floodplain Forest include the more hdyric **Overcup Oak Series**, the traditional **Water Oak-Willow Oak Series**, and the well-drained **Swamp Chestnut Oak-Willow Oak Series**. Red maple, water hickory, and willow oak are usually intermixed in the **Overcup Oak** community. Sweetgum, cherrybark oak, ash, and overcup oak with ironwood, eastern hophornbeam, deciduous holly, and Florida maple in the understory can be found in **Water Oak-Willow Oak Series**. Sweetgum, overcup oak, and cherrybark oak in the overstory with dwarf palmetto in the understory can be found in the **Swamp Chestnut Oak-Willow Oak Series**.

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- **Grassland Perennial Streams.** On the LT's of the Grasslands, perennial streams do not display typical floodplain forest characteristics, they develop a mix of hardwood species best described as the **Pecan-Sugarberry Series** and **Sugarberry – Elm Series**. These streamcourses are generally fair to well-drained floodplains, with a substantial mix of more upland tree and herbaceous species.

-

- **Floodplain Forest Intermittent Streams.** Intermittent streams in both Forest and Grassland landscapes will develop on well drained streamcourses. These streamside zones may be difficult to distinguish from the adjacent upland areas due to a vegetation mix of species, especially if the surrounding uplands are oak-hickory or oak-pine type. The floodplain and topographical situation will help define this area, and in the more mesic intermittent streams, species from the periodically flooded perennial streams or **Floodplain Forest** areas may occur.

-

- **Mesic Forest Intermittent Streams.** Intermittent Streams developed on side slopes and areas between uplands and stream bottoms. Desired natural condition will be a multi-aged forest with many large-sized individuals. There is usually a rich assemblage of lichens, mosses and liverworts on soil, fallen logs, stumps, shrubs, and trees.

-

- **Grassland Intermittent Streams.** Intermittent streams on the grasslands will be the most difficult to define. Wide variation in both the physical and biological character may exist depending on soil, surface, geology and landform.

- **Objectives**

- This area will be managed to provide diverse stands of hardwoods and some pines, with a wide variety of understory vegetation. The water bodies such as lakes, perennial wetlands and associated areas contribute to the diversity and dispersion of native animals and plants within each drainage, these drainages connect to the larger watersheds found throughout the NFGT. These linkages provide dispersal for populations of fish, wildlife and plants. This Management area will be managed to meet the recommendations in the Texas Wetlands Plan (TPWD 1988) and Best Management Practices (BMP) established by the state.

Primary objectives to manage for:

- * Maintenance of high quality water and abatement of downstream flooding.
- * Enhancement of all associated resources.
- * Protection of aquatic, riparian habitat and special plant communities.

Secondary objectives to manage for:

- * Dispersion for animal and plant species by maintaining connecting habitat among mature and old growth stands of trees,
- * Maintenance or improvement of mast-producing wildlife habitat,
- * Recreation and scenic use compatible with other riparian management objectives, and,
- * Special wildlife habitat needs such as for threatened and endangered species, raptor nests and perches, and nests/dens for cavity dependent species.

The actual streamside riparian management area boundaries shall be identified as an Intermittent Stream or Perennial Stream. Determination of those classifications shall be by an onsite reconnaissance of topographic and biotic features, or as determined by the Forest Soil Scientist, Botanist or Hydrologist during site-specific environmental analysis.

A Primary Zone and a Secondary Zone will be identified within the Stream Side Management Zone (SMZ). The primary zone will be a 50-foot protection zone to ensure primary objectives of the area are achieved. This primary zone will extend from the stream channel edge outward 50 feet on either side of the stream. The secondary zone will be delineated from the primary zone outward to the extent of the SMZ to achieve objectives of this zone. The outer edge of the SMZ will vary depending on both biological and physical factors within the LTA, historical use and topographical position.

Standards and Guides

MA-4-31 Prescribed fire may be used to enhance riparian vegetation or wildlife habitat.

- a. Encourage the use of green lines, wet lines, or foam lines rather than plowed firelines. Minimize the amount of plowed fireline which might impair the hydrology of the riparian ecosystems. Generally plowed firelines will not be allowed within the primary zone,
- b. Prescribed fire will generally not be used in large riparian areas,
- c. Low intensity backing fires may be used in smaller streamside zones,
- d. Fire maintained wetlands, baygalls, and bogs should be burned frequently to meet the desired future condition.

MA-4-32 The appropriate wildfire suppression response may be confinement, containment, or control.

Management Area 5 Major Aquatic Ecosystems

This management area prescription applies to the 15,682 acres of lakes, reservoirs and the lands inundated by them at normal pool level. They are:

Caddo National Grassland:
Lake Fannin - 35 acres
Coffee Mill Lake - 651 acres
Lake Crockett - 360 acres

LBJ National Grassland.
Black Creek Lake - 33 acres
Cottonwood Lake - 45 acres

Desired Conditions

Both submergent and emergent vegetation are maintained for fish and wildlife habitat. Shorelines are managed by the U. S. Forest Service according to this and other management area prescriptions to maintain a natural appearance.

Objectives

These areas provide a range of settings offering clean water, wildlife habitat, hunting, fishing and other recreational opportunities dependent on aquatic environments, with access from adjacent developed or primitive recreation areas. A portion of perennial streams, draining into these areas, support native fish populations that can provide fishing opportunities and riparian dependent species, such as waterfowl, that can provide hunting and wildlife viewing opportunities.

Goals

- * Maintain high quality, functioning aquatic ecosystems.
- * Maintain water quality sufficient to meet Clean Water Act and Texas Water Standards.
- * Minimize risks of downstream flooding.
- * Maintain viable populations of native fish and aquatic dependent wildlife species which would be found in man-made reservoirs.

* Provide a safe, healthful, aesthetic, non-urban aquatic environment for the pursuit of natural resource-based recreation.

Standards and Guides

See Forest-wide Standards and Guides.

Management Area 8a Research Natural Area (RNA)

This Management area includes the 380 acre Cross Timbers Research Natural Areas on the LBJ National Grasslands. Three exemplary plant communities (Bluestem Tallgrass Prairie, Western Post Oak-Blackjack Oak Woodland, and Texas Oak Woodland) are found in the area.

Desired Conditions

Plant and animal communities native to the area evolve with little or no impact from humans. The oak savanna and woodlands appear as a mix of many species of some young, but primarily old trees with areas of native tallgrass prairie. Some areas may show signs of recent wildfires or insect or disease outbreaks. In these areas you will see dead standing and down trees with patches of bark and branches missing and brown needles or leaves. These trees may have cavities in them and show small holes that are the signs of woodpeckers or other animals and insects. Where the Cross Timbers RNA Establishment Report determined prescribed burning or grazing is needed to establish or maintain vegetative communities, you may see these activities.

Objectives

Research natural areas are managed for non-manipulative research, observation, and study. RNAs serve as control areas for comparing results from manipulative research, and for monitoring effects of resource management techniques and practices.

Goals

- * Comparison with those lands influenced by man.
- * Provision of educational and research areas for ecological and environmental studies.
- * Preservation of gene pools for typical as well as rare and endangered plants and animals.

Standards and Guides

MA-8e-31 Limit suppression strategies, practices and activities to those which have minimal impacts to RNA values. Extinguish wildfires endangering the RNA.

MA-8a-32 Avoid using chemical fire retardants.

MA-8a-33 If fire is used to perpetuate a seral or successional stage, it should mimic a natural fire, but with prudent measures to avoid a catastrophe.

Managed or naturally occurring fire may be used to perpetuate a desired series of plant formation or changes.

MA-8a-34 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of

the RNA.

Leave fire-caused debris for natural decay.

**Management Area 8d Natural Heritage Areas
List of Natural areas on the Caddo and LBJ NG**

Caddo NG		
Sites	Acres	Landtype Association
Center Point Prairie	90 acres	Blackland Prairie
Coffee Mill Lake Prairie	27 acres	Crosstimbers
Gober Prairie	60 acres	Blackland Prairie
Lake Crockett Flatwoods	60 acres	Crosstimbers
Spoonamore Prairie	19 acres	Crosstimbers
LBJ NG		
Bald Knob Hill	33 acres	Limestone Mesa
Pecan Creek Mesa	30 acres	Limestone Mesa
Post Oak Ridge	88 acres	Crosstimbers
Pringle Creek	93 acres	Crosstimbers

Desired Conditions

Emphasize relict plant populations and plant communities, especially the mesic hardwood types.

Objectives

Enhance, and promote sustainable populations of unique plants or plant communities.

Goals

In these areas, the natural disturbance effects of fire, weather, and erosive action should be allowed to work unimpeded. Allow frequent fire return intervals to enhance the species composition of fire maintained communities. Fires should be allowed to burn throughout the area, and not be limited to specific sites, to allow natural plant community variability and ecotones to reestablish.

Standards and Guides

MA-8d-31 Limit suppression strategies, practices and activities to those which have minimal impacts to botanical values. Extinguish wildfires endangering the area.

MA-8d-32 Use prescribed fire to manage or maintain the botanical character and successional stages for which the area has been designated unless restricted in certain plant communities as defined in specific botanical areas.

MA-8d-33 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of the area.

Leave fire-caused debris for natural decay

Management Area 8f Cultural Heritage Areas

Description

Lake Fannin Organizational Camp (200 acres) on the Caddo NG

Archeological and Historic Areas - A unit of land possessing features, sites, or a concentration of sites, buildings, structures, or objects united historically or prehistorically by plan or physical development, and which have been determined to be significant to our understanding of the prehistoric and historic occupation and utilization of the lands in which they are located

Desired Condition

The historical integrity of the sites are maintained so that the scientific and educational values are retained.

Objective

Not Stated

Goals

Not Stated

Standards and Guides

MA-8f-31 Manage fire and fuels through suppression practices, management of ignited prescribed fire, and vegetation manipulation to protect the values for which the area is designated or to maintain or restore natural conditions.

MA-8f-32 Accomplish fire suppression and fuels management without the use of heavy equipment or fire plows in those areas where their use would endanger the historical or contextual integrity of site feature or cultural deposits.

Management Area 9a Developed Recreation Sites

On the Caddo and LBJ N.G. the developed Recreation Sites are: East Coffee Mill, Lake Davy Crockett Campgrounds, Black Creek Lake and Cottonwood Lake.

Desired Condition

Areas and sites developed with recreational user facilities to enhance camping, picnicking, swimming, boating, and fishing for National Forest visitor's interpretation and enjoyment of using the Forest and Grassland environments are emphasized.

Objectives

Facilities will be as natural, simple, and unobtrusive as possible, when possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals.

- * Provide a safe, healthful, aesthetic, and non-urban atmosphere for the pursuit of natural resource based recreation.
- * Provide facilities and improvement at an appropriate level of accessibility, consistent with resource protection needs and anticipated user demand.

* Provide opportunities for meaningful recreation experiences consistent with user demand and expectation.

Standards and Guides

MA-9a-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9a-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

MA-9a-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 9b Minimally Developed Recreation Sites

Desired Conditions

Most areas have a low development scale with few amenities provide. These areas provide a wide spectrum of forest and rangeland settings offering a range of recreation opportunities.

Objective

Facilities will be as natural, simple and unobtrusive as possible, when possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals

* Provide facilities and improvements, consistent with resource protection needs, anticipated user demand and compatible with management goals for the surrounding area, to support specialized and dispersed recreation use on the Forest and,

* Provide a safe, healthful, aesthetic atmosphere for the pursuit of natural, resource based recreation.

Standards and Guides

MA-9b-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9b-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

Ma-9b-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 10b Special Use Permit Sites: Example Utility Corridors

Desired Condition

The desired future condition is a pattern of special uses established to provide facilities, services, or opportunities that are in the general public interest.

Objective

When feasible, special uses are combined in a single corridor rather than developing parallel corridors.

Goals

- * Provide safe, efficient facilities and improvements in an environmentally sensitive manner.
- * Authorize only those occupancies which promote and support the general public welfare, and do not conflict with law and Forest Service policy.
- * Minimize inconsistency with surrounding land uses and minimize the adverse impacts of these uses on other resources.

Standards and Guides

See Forest Wide

3.2.3E FMU Characteristics

3.2.3.1E Safety

- **Flora and Fauna:** The Copperhead is the most common snake found on the Grasslands; however, fire crews have routinely located cotton mouths and rattlesnakes as well. Poison Oak, Ivy, and Sumac, and numerous species of briars with thorns that can penetrate protective clothing making some areas hard to walk through and hindering movements from firelines to safety zones can also be found while working in the Grasslands region.
- **Snags:** Texas has been hit by several wind events and hurricanes over the past 10 to 15 years which has produced numerous snags with the potential to pose a threat to both firefighters and the general public and made fires harder to contain.
- **Environmental Conditions:** Texas is known for long, hot, humid, summer months that can lead to illness caused by overheating. During its short winter season, Texas can also experience periods of freezing temperatures and the occasional ice storm or snow storm.
- **Transportation:** Hwy 287 is a major travel route to and from the DFW Metroplex; the posted speed limit is 70MPH with numerous un-controlled interchanges and crossovers. The BNSF Railroad paralleling Hwy 287 transects the grasslands. Most crossings entering the grasslands have warning lights and arms; however, there are a few crossings on the north end of the district that do not. With several trains a day traveling in excess of 40mph, employees must use extreme caution when approaching R&R crossings. Most county roads are paved or gravel; however, there are numerous narrow spots with no shoulder and blind corners throughout the grasslands. With numerous Oil and Gas production wells located on or near the grasslands, staff should be prepared to encounter large equipment and tractor trailers on these narrow roadways. The Forest Service roads on the grasslands are open range and may have livestock on them as well.
- **Oil and Gas Activities:** The LBJ has 72 active Oil and Gas Wells, as well as numerous pipelines and storage facilities. Most pipelines are buried below ground

but a few may still be found on the surface. Supervisors should ensure that all personnel are properly briefed prior to taking action in the area and use extreme caution during dozer operations. Power lines may also provide an additional hazard near oil and gas locations and private residences.

- **Illegal Drug Use:** Be cautious of suspicious people and vehicles; avoid contact with suspicious debris such as portable meth labs, discarded needles, and glass pipes.

3.2.2.2E Physical

- The LBJ Grasslands are located approximately 50 miles northwest of Dallas TX, and the Caddo Grasslands are located approximately 65 miles northeast of Dallas TX. FMU boundary coincides with the LBJ and Caddo Grasslands proclamation boundary.
- Topography: The Topography is flat to gently rolling. The average slopes ranges from 0 to 5% though in some cases slopes can be as steep as 15 to 30%.
- Elevation ranges from 350 to 950 feet above sea level.

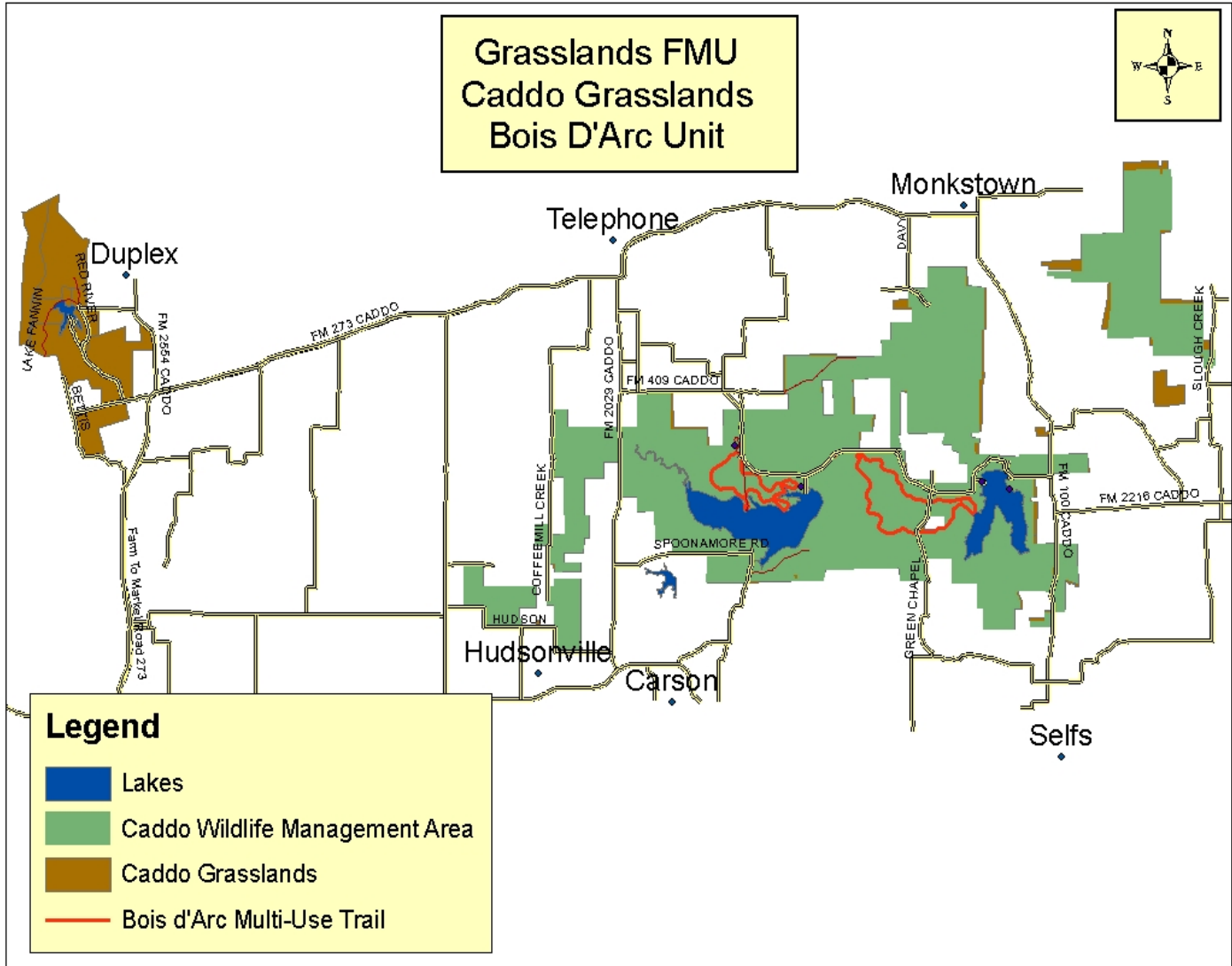


Figure 1: Grasslands FMU, Bois D'Arc Unit

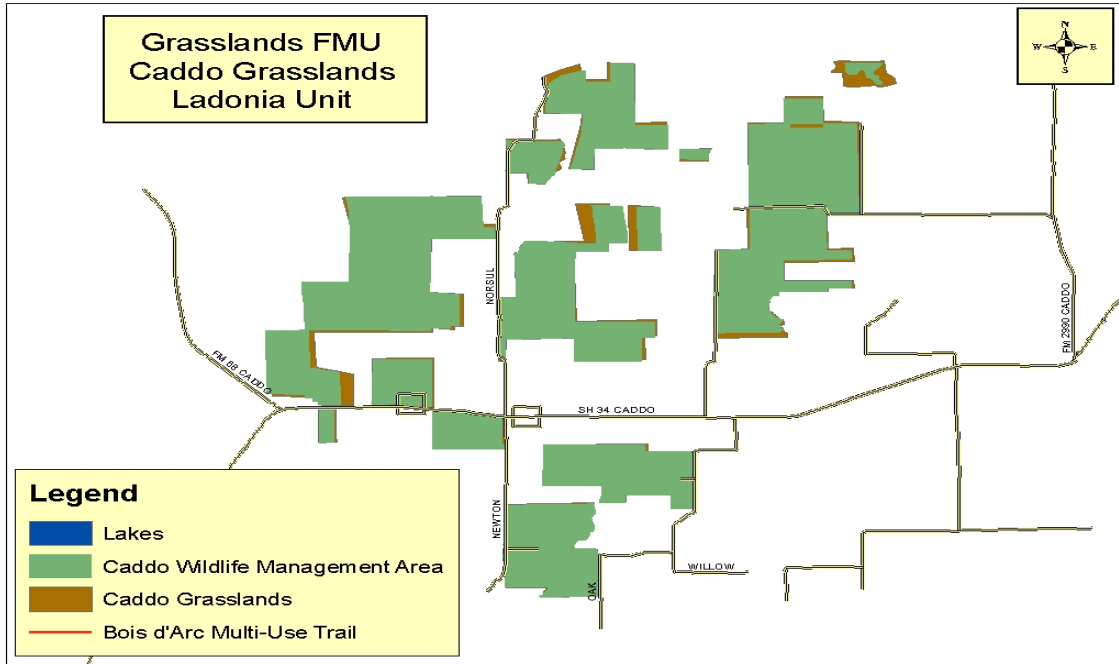


Figure 2: Grasslands FMU, Ladonia Unit

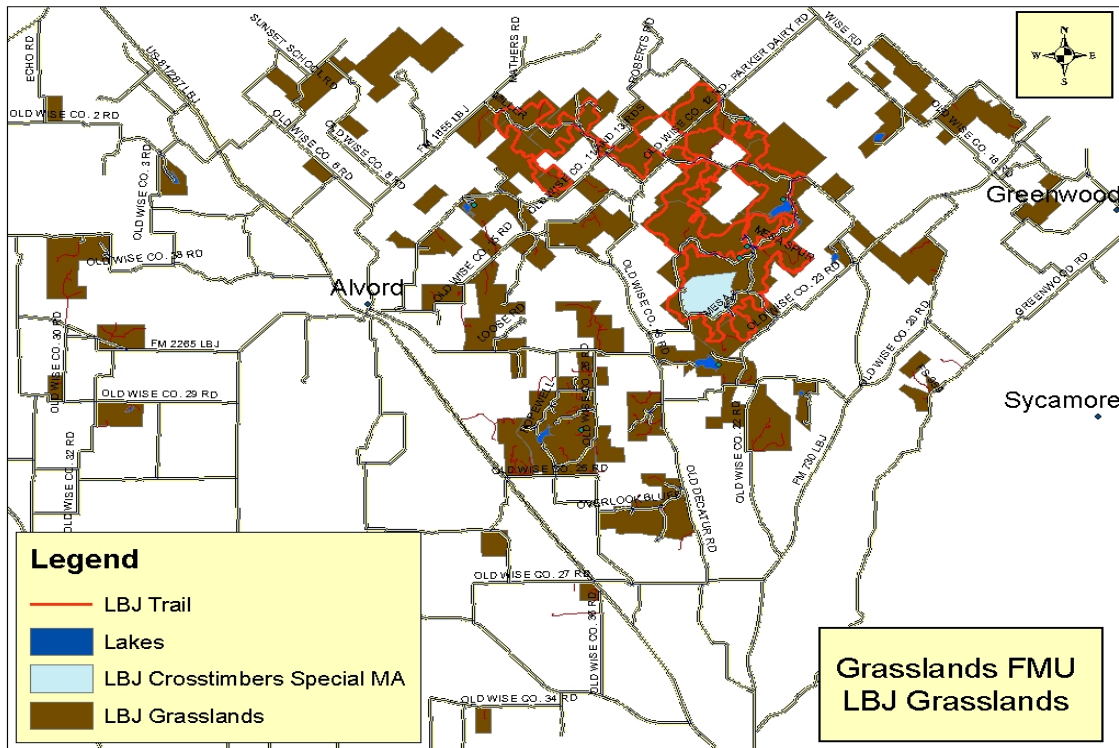


Figure 3: Grasslands FMU, LBJ Unit

3.2.3.3. E Biological

Ecological Systems

Table 1 list the landtype associations or ecological classification system classifications found on the Grasslands FMU. An ecological classification system classifies land into ecologically equivalent units on the basis of an integration of multiple components of the forest ecosystem, including soils, physiography, and vegetation. A land classification based on these components reflects the influence of environmental characteristics of a site, and it gives information about its inherent ecological potential and types of living communities it will support.

Desired Ecological Systems for the Grasslands FMU

Table 1: Landtypes Associations

Landtypes Associations	
Limestone Mesa	Eastern Crosstimbers
Western Crosstimbers	Blackland Prairies

3.2.2.4. E Resources (Wildland Urban Interface, Special Areas, and Recreation Resources)

- **Wildland Urban Interface**

The Grasslands FMU has extensive urban interface. It is broken up into numerous blocks that are surrounded by houses and associated private development.

- **Special Designations**

Table 2: Special Area

Special Areas within FMU	Acres
Cross Timbers Research Natural Areas on the LBJ	380
Lake Fannin Organizational Camp on the Caddo	200

- **Recreation**

Trail System
Camping
Boating

Table 3: List of Recreation areas found on the Grasslands FMU

Name	Type	Name	Type
Black Creek Lake	Campground	Rhoades Lake	Day Use
Black Creek/Cottonwood	Trailhead	RED HILLS LAKE	Campground
Clear Lake	Fishing	Tadra Point	Horse Camp
Cottonwood Boat Ramp	Boating	Valley View Group Use	Horse Camp
Bois D’Arc	Horse Camp	Coffie Mill	Campground

East Lake Davy Crockett	Campground	West Lake Davy Crockett	Campground
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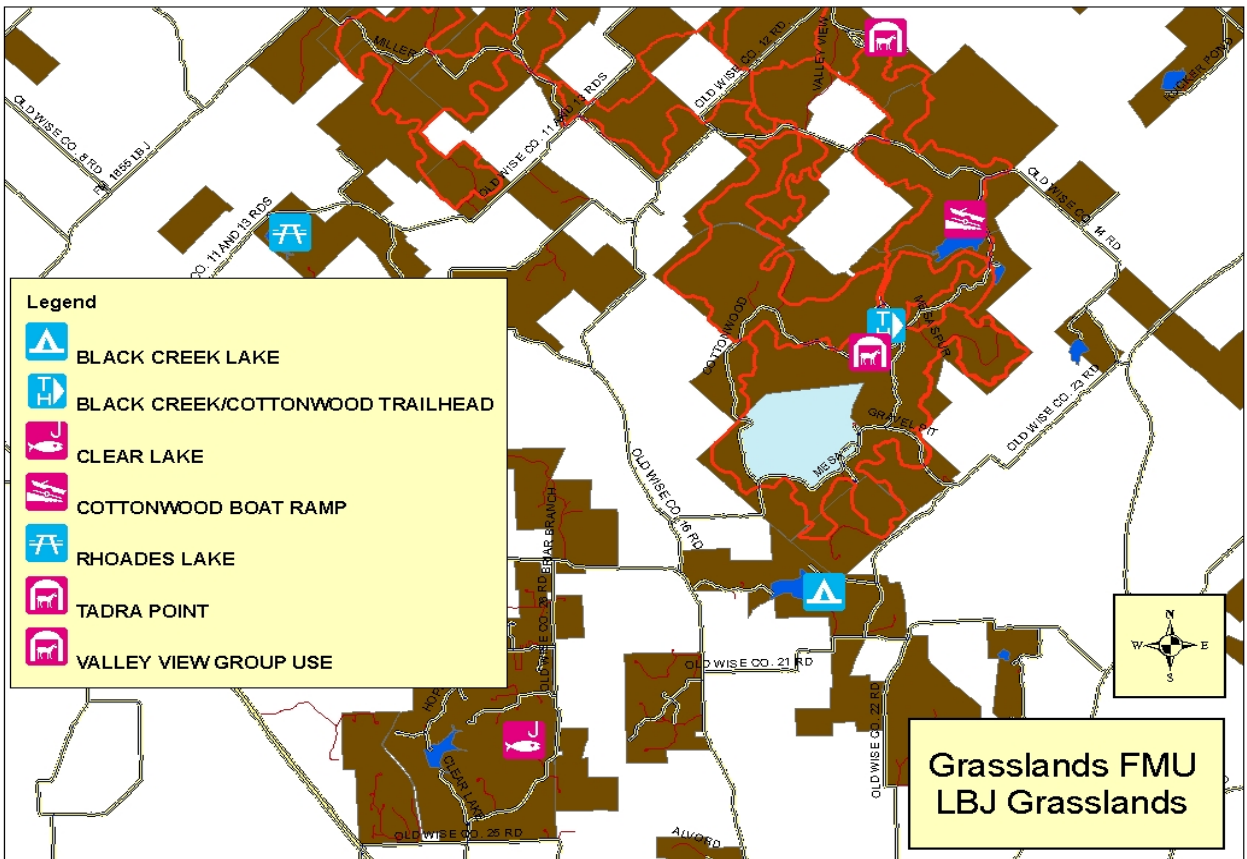


Figure 4: Grasslands FMU Recreation Sites, LBJ

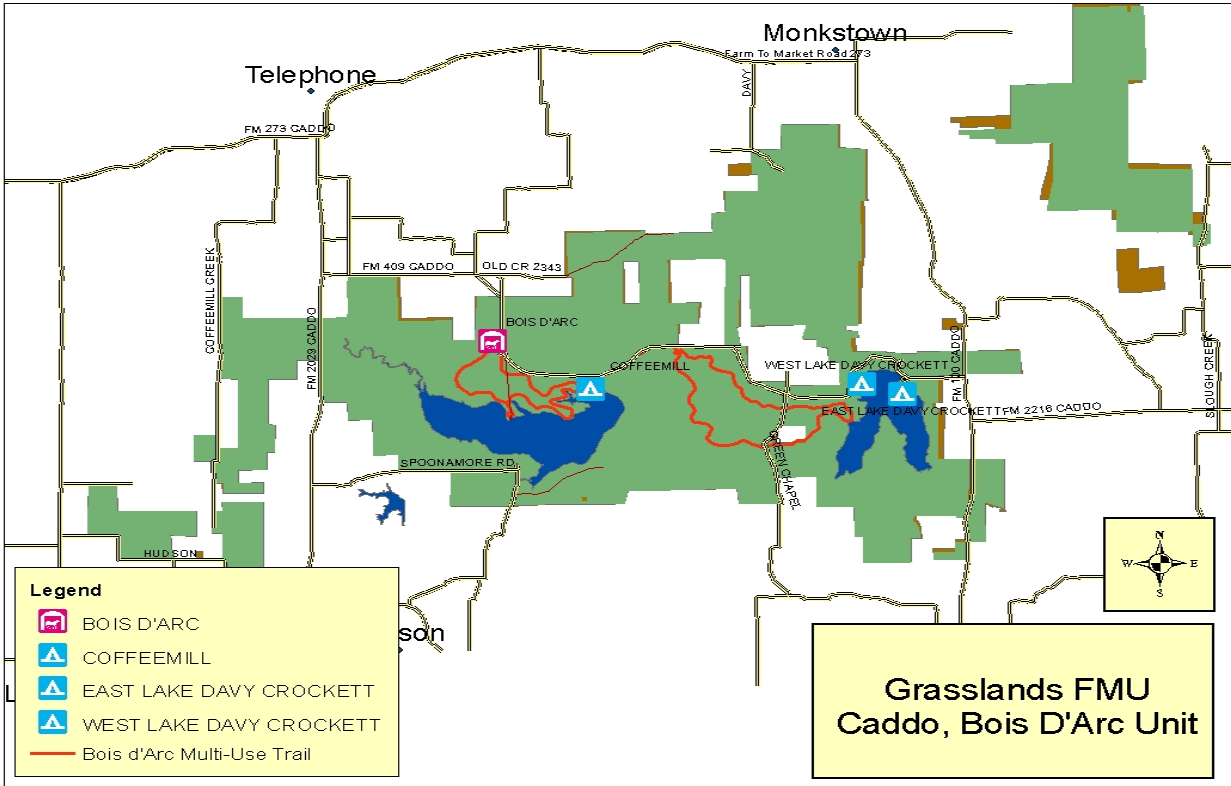


Figure 5: Grasslands FMU Recreation Sites, Caddo Grasslands

3.2.4. D FMU Fire Environment

The Grasslands prescribe burns 5,000 to 10,000 acres a year. The grasslands are characterized by predominantly grass fuel models on the LBJ unit and more of a hardwood component on the Caddo Bois D’Arc unit. In areas that are managed for grazing allotments limited fuel build loading is present.

3.2.4.1. D Fire Behavior

The following Fuel Models are found on the Grasslands.

Table 5: Fuel Models Present on the Grasslands FMU (Source; Landfire)

Fuel Model With approximate acres	Fire Behavior Notes
GR2 2191 acres/Caddo 8901 acres/LBJ	Primary carrier is grass, very little shrubs present. Average depth 1 foot. Spread rate can be high especially with wind pushing it, moderate flame lengths. Moisture of extinction is 15 percent.
GS1 1204 acres/Caddo 564 acres/LBJ	A mixture of grass and shrubs. Moderate fuel loading, average depth less than 1 foot. Spread rate is moderate, flame lengths is low. Can have higher flame lengths as compared to GR3. Moisture of

	extinction is 15 percent.
SH2 1148 acres/LBJ	Low shrub fuel load, fuelbed depth about 1 foot. Spread rate is low, flame length is low. Moisture of extinction is 15 percent.
TL6 11419 acres/Caddo 7797 acres/LBJ	Pine-hardwood overstory with a moderate fuel load, average depth 2 to 4 inches. Spread rate is moderate . Moisture of extinction is 25 percent.
TU1 2659 acres/Caddo 44 acres/LBJ	Pine or Oak Savanna with a moderate forest litter load and grass and shrub components. Spread rate is high, flame length is moderate. Moisture of extinction is 20 percent.

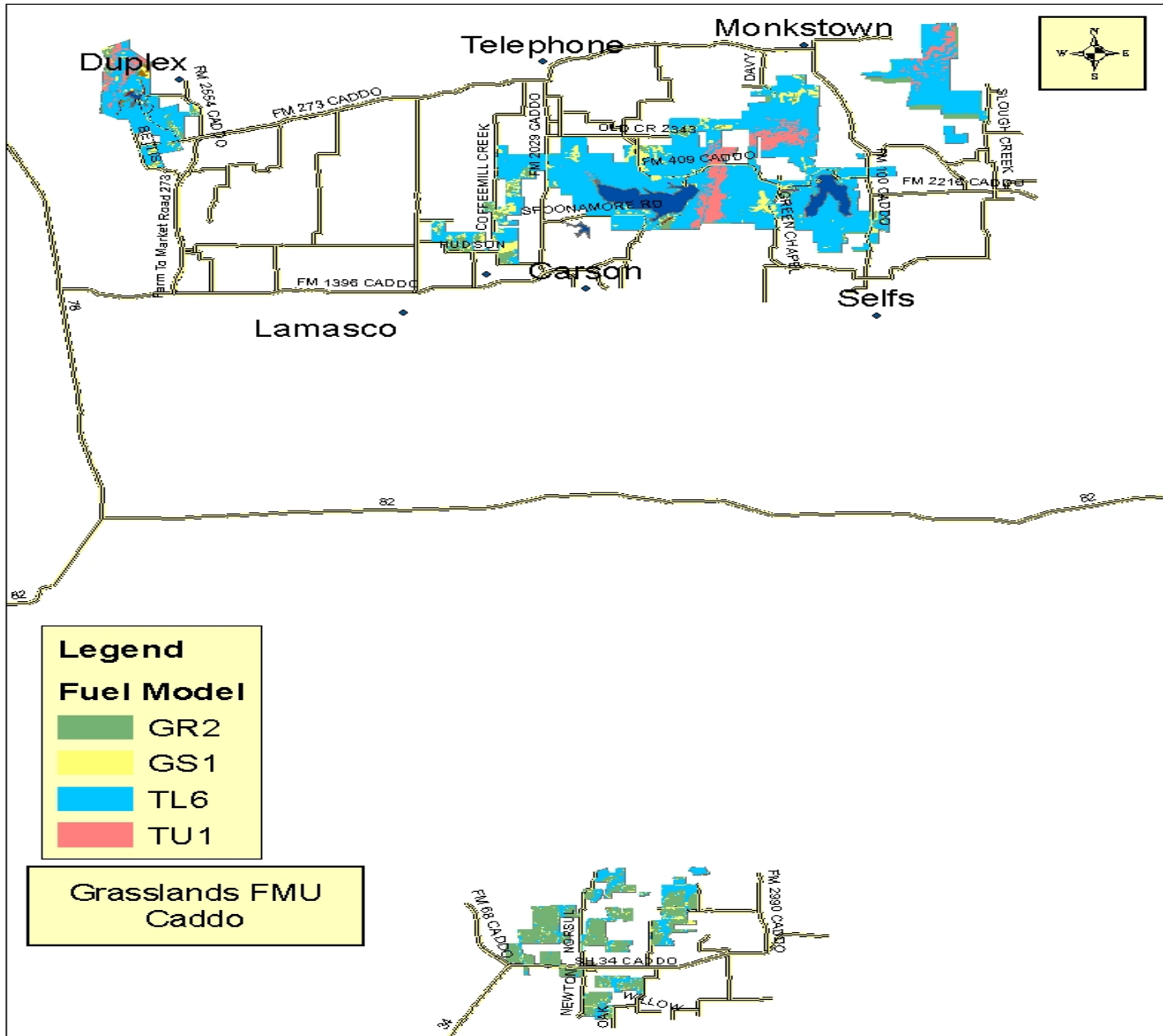


Figure 6: Map showing Fuel Model Distribution on the Grasslands FMU, Caddo Unit

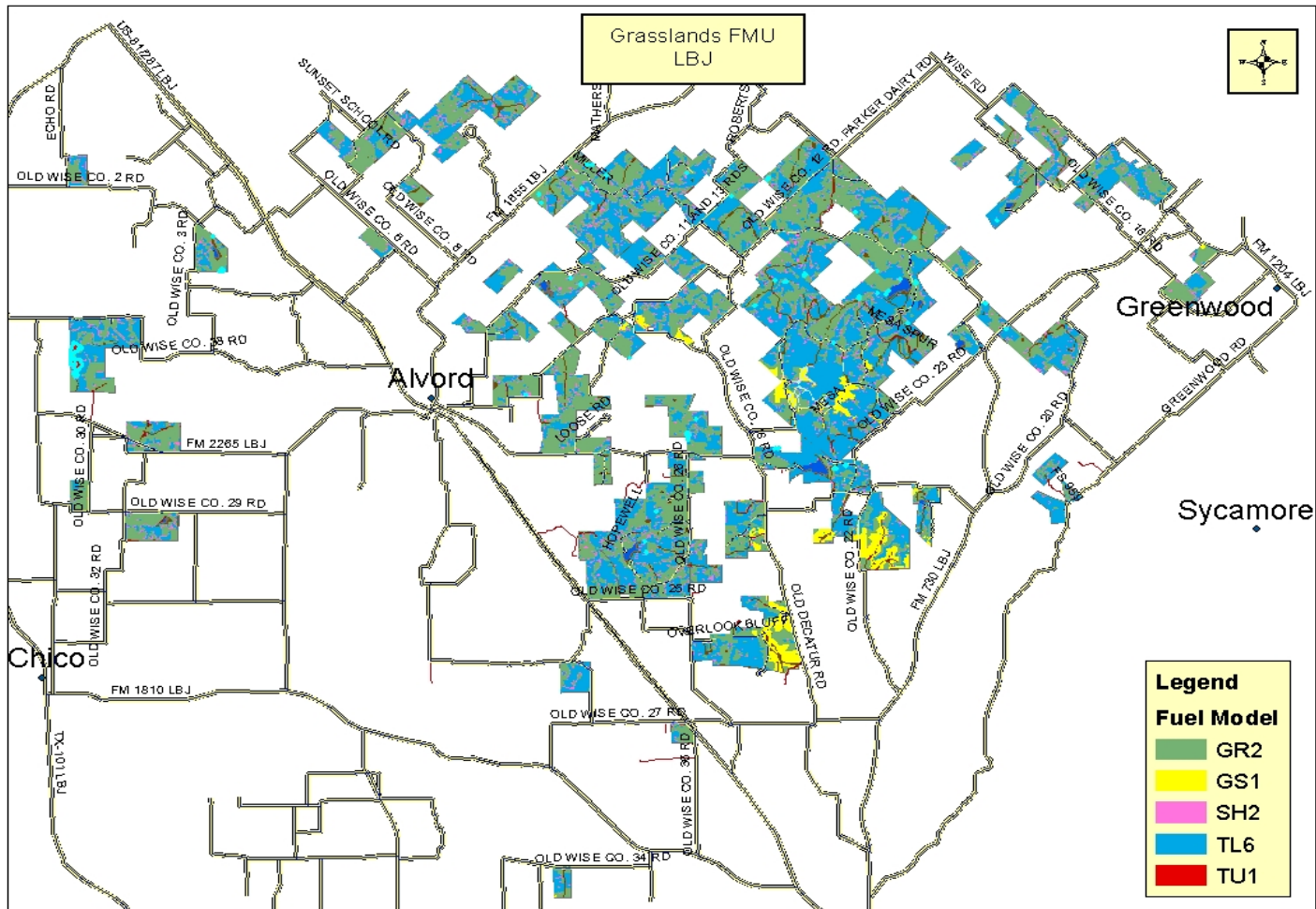
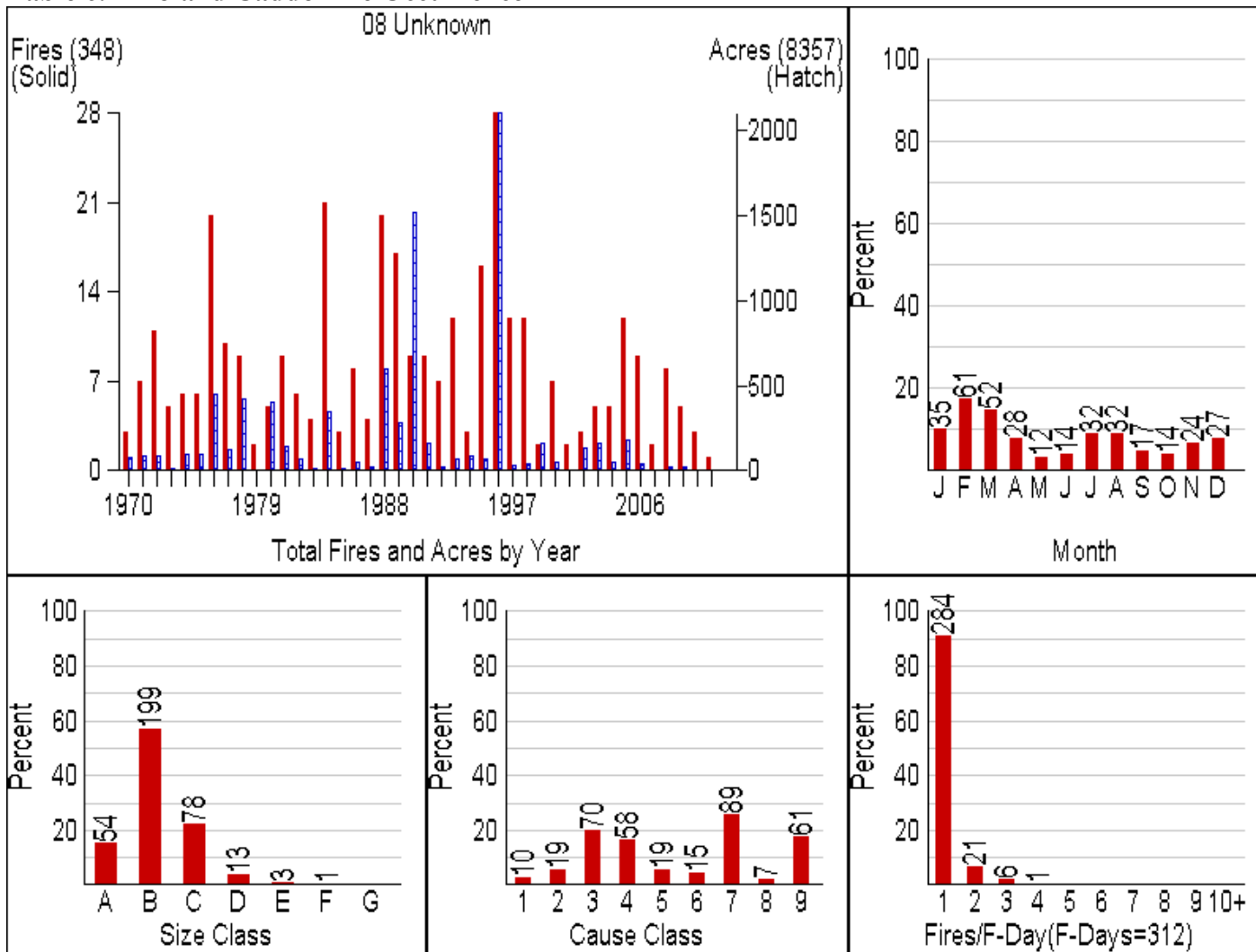


Figure 7: Map showing Fuel Model Distribution on the Grasslands FMU, LBJ Unit

Historical Wildfire Fire Occurrence

The Grasslands FMU had 348 fires between 1970 and the start of 2011. This is an average of 8 to 9 wildfires a year. Most of the fires occur in the Spring and late Summer but fires can occur year round. The largest fire was 1,356 acres and occurred on 2/12/1990. Most of the fires were arson caused with some limited lightning caused fire.

Table 6. LBJ and Caddo Fire Occurrence



Size Class A = 0.0 to 0.25 ac; B = 0.26 to 9.9 ac; C = 10.0 to 99.9 ac; D = 100.0 to 299.9 ac; E = 300.0 to 999.9+ ac.

Cause Class: 1 = Lighting, 2 = Equipment, 3 = Smoking, 4 = Campfire, 5 = Debris Burning, 6 = Railroad, 7 = Arson,
8 = Children, 9 = Miscellaneous

3.2.4.2 E Weather

The winter is generally the driest time of the year with the greatest wind event potential and low relative humidity's behind passing storms, though widespread precipitation can also occur. During the spring the potential for windy and dry events diminishes steadily from south to north as the jet stream retreats. Shifts in the jet stream allows warm, moist air masses arising from the Gulf of Mexico to become increasingly dominant. The summer is generally warm to hot and humid with light winds under the Bermuda High influence. Critical drying can occur if the high becomes centered over land and becomes modified. A period of peak tropical cyclone activity begins late in the summer, bringing the potential for windy/dry conditions in advance of any storms followed by copious moisture. The fall brings a continuance of the tropical cyclone season early, then dry air intrusion and the potential wind events return with the southward shift in the jet stream. Moist conditions often persist along the Gulf Coast through fall.

Other climate factors that influence Texas weather include the Mexican High Plain, or Altiplanicie Mexicana. This arid, high-altitude plateau region extends northward from Mexico City nearly to the United States border. Rarely does this air reach ground level in Texas except in the Trans-Pecos region, but it influences the weather throughout the State. When surface winds in Texas are from the south or southeast, winds 10,000 feet above ground are normally from the southwest. Thus, low-level air from the Gulf of Mexico is overlaid with warmer, drier air from the Mexican High Plain. Close to the Mexican border, this warm air 'caps' the humid Gulf air, preventing thunderstorm activity and trapping the humid air close to the ground. As the air masses precede north, particularly during the spring and fall, they progressively move beneath cooler air aloft. While the humid low-level air becomes more unstable, it still cannot convect because of the capping inversion. Eventually, if a frontal system or other disturbance causes larger-scale ascent, the Mexican High Plain air can cool enough to eliminate the cap, suddenly allowing vigorous thunderstorm activity to take place. The combination of the Gulf of Mexico and the Altiplanicie Mexicana makes Texas and the southern Great Plains the worldwide hot spot for severe convection and tornadoes.

The Rocky Mountains also has an impact on the climate in Texas. Arizona, New Mexico, and west Texas form one of two relative gaps in the Rocky Mountain Cordillera; the other is along the United States-Canadian border. Westerly winds often blow through this gap, but the Rockies form a broad barrier to westerlies for the rest of the State. In the eastern half of Texas, the least likely wind direction is from the west. The Rockies also block air from moving across them from the east. In particular, cold

air masses that reach the United States from the north cannot easily spread westward and instead are funneled southward parallel to the mountains. Such cold air reaches farther south into Texas and beyond than anywhere else on the continent.

Despite the threat of the rare snow or ice storm, winters in most parts of Texas are mild and pleasant. Sunshine averages at least 45 percent of maximum possible along the coast. In Houston, the growing season is 300 days long; in Dallas, 235. The latest freeze typically occur after April 1st, in less than half the State.

May is typically the wettest month of the year and also has a high occurrence of tornados. Summer produces the most equitable distribution of rainfall. Thunderstorms are common in the State, but the departure of the jet stream to the north means that severe thunderstorms are a rarity. Despite the continued rainfall, the high temperatures mean that normal evaporation exceeds precipitation in all areas of the State. Below-normal precipitation can cause significant environmental stress, and the State is most susceptible to drought during summertime as a result. The reduced evaporation from the soil and plants under drought conditions also causes temperatures to be just a little bit warmer, making the situation even worse.

The following was taken from the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center;

http://hurricane.ncdc.noaa.gov/climate_normals/clim60/states/Clim_TX_01.pdf, accessed April 27, 2011.

Table 7: Annual Weather for the Grasslands FMU.

LBJ Denton	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation	1.94	2.55	2.82	3.30	5.41	3.29	2.53	2.26	3.35	4.81	2.87	2.66	37.79
Mean Temp	42.7	48.0	55.9	63.4	71.6	79.1	83.6	82.7	75.6	65.3	53.6	45.4	63.9
Caddo Greenville	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation	2.51	3.16	3.67	3.79	5.47	4.03	2.96	2.18	3.56	4.91	3.98	3.48	43.70
Mean Temp	41.7	46.5	54.2	61.9	70.3	78.3	82.7	82.3	75.6	64.9	53.1	44.4	63.0

3.2.1 Fire Management Considerations for Specific Fire Management Units

3.2.1D FMU Snap Shot

- FMU Number: Sabine NF
- Fire Behavior Indicator: BI
- NFDRS Weather Station: Sabine North, Station ID, 412901, and Sabine South, Station ID, 413701
- Nearest Weather Station: Sabine North, Station ID, 412901, and Sabine South, Station ID, 413701
- Acres/Agency: 160,609 acres, USFS
- Predominant Vegetation Types: Southern Rough, pine stands on relatively flat to rolling hills with sandy loams. The understory vegetation is dominated by woody shrubs and subdominant hardwood species. Hardwood bays can also be found throughout the FMU.
- Unit: 71
- IA assets assigned to this FMU: Two type 3 dozers and one type 5 Engine
- Duty Officer: Jamie Sowell DFMO or Dale Snyder DAFMO
- IA Dispatch Office: Texas Interagency Coordination Center
- Communities adjacent or within FMU: Shelbyville, Patroon, San Augustine, Milam, Hemphill
-

Options available for management response to wildland fires:

Management Actions allowed in this FMU

The response to wildfires in this FMU includes the full range of suppression strategies. “The suppression response may be confinement, containment, or control.” (NFGT LRMP 1996, pg. 64) Thus initial actions may include size-up, patrolling, monitoring, holding actions, or an aggressive initial attack.

Initial response to fires within the FMU will require an assessment as to what initial action to take. The FMO/IC begins this assessment immediately by evaluating the probable cause and location of the fire relative to the hazards to firefighters/public and the risk to natural resources.

Commensurate with the assessment, initial attack resources are dispatched to a fire under the assumption that the fire is to be managed to meet protection objectives unless directed otherwise. Human caused fires will be suppressed to meet protection objectives that minimize negative consequences with respect to firefighters and public safety.

Fire Managers and Line Officers will use the Wildfire Decision Support System (WFFDS) to guide and document wildfire management decisions. The WFFDS will provide situational assessment, analyze hazards and risks, define implementation actions, and document decisions and the rationale for decisions.

•

- **3.2.2D FMU Guidance**

- This section describes direction specific to the management areas (MAs) on the Sabine NF that coincide with the Sabine FMU. The goals, desired future conditions, objectives, standards and guidelines for the area make up the management area direction. The MAs are identified by number and name. Forest-wide goals, objectives, and standards and guidelines apply to all management areas unless specifically exempted or modified by the management area direction.

-

- **Management Area 1: Upland Forest Ecosystems**

- **Desired Conditions**

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Mayflower Uplands and Clayey Uplands LTA's) on the Sabine NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridgetops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas the longleaf type had been replanted to slash pine and these areas will be converted back to the native longleaf as soon as possible. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switchgrass, and Indian grass). Interspersed within this Longleaf Pine Ecosystem is a diverse array of mixed forests on the lower slopes of ridges, extending into the streams. Hardwood bottomlands, drainages, seeps, and bogs will perpetuate subtle to major hydrologic differences in the uplands. Many stream courses will portray characteristics of the mixed forest ecosystem, although frequent fires on the uplands will limit the development of these mixed forest communities to the very wettest and widest riparian areas. Narrow stream courses and wetlands will develop an open aspect similar to the upland communities. These inclusions create transitions that begin with pure longleaf pine, grading to mixed species such as loblolly, shortleaf, and oaks, then gradually transcend into bottomland hardwood areas along larger streams.

For the Northern and Mid-Coastal Plains, Western Transition Coastal and Sandhill Subsections (Clayey Uplands, Redlands, and the Lignitic Uplands LTA's) on the northern Sabine NF.

Over this landscape you will view open shortleaf pine forests with a mix of oak and hickory trees situated on hills having deep sandy or red clay soils. Ridgetops and upper slopes of droughty hills will be dominated by the Shortleaf Pine-Little Bluestem Communities. More moderate rolling terrain and side slopes with less droughty, loamy soils will be dominated by the Shortleaf-Oak-Hickory Communities. The understory vegetation on the dryer hilltops is dominated by fire tolerant shrub and perennial grasses (primarily little bluestem). Woody understory species such as yaupon, sumac, and greenbrier are more prevalent on lower slopes and loamy soils. Interspersed within this Shortleaf Pine Ecosystem are mixed loblolly and hardwood forests (on the lower slopes of ridges extending into the streams). Some hardwood bottomlands will provide hydrologic and plant community diversity.

- **Objectives**

This area is managed for regeneration and restoration of the Upland longleaf and shortleaf Forest Communities.

Goals

Provide opportunity for timber production and mineral exploration and development while maintaining a predominantly natural appearing landscape, clean water, productive soil, little soil erosion, viable populations of wildlife, and habitat for threatened, endangered, or sensitive species of plants and animals.

Standards and Guidelines

Ma-1-31 Utilize prescribed fire to manage the various components of the ecosystems.

- a. Fire frequency will generally range from three to seven years. More frequent burning may be required in certain plant communities, as prescribed by site-specific environmental analysis.
- b. Emphasize growing season burning in habitat that was historically maintained by growing season fires

MA-1-32 Wildfire suppression response may be confinement, containment, or control.

Management Area 2: Red-cockaded Woodpecker RCW Emphasis

Desired Conditions

For the Western Coastal Plains and Mid-Coastal Plains Transition Subsection (Mayflower Uplands and Clayey Uplands LTA's) on the Sabine NF.

Over this landscape you will view open longleaf pine forests, situated on rolling hills with droughty soils. These longleaf pine forests will become more obvious and widespread across the landscape, with fewer components of other pine forest communities. Ridgetops and upper slopes of hills will be dominated by Longleaf Pine Savanna Communities. Historically, in some areas the longleaf type had been replanted to slash pine and these areas will be converted back to the native longleaf as soon as possible. The understory vegetation is dominated by perennial prairie grasses (primarily little bluestem, switchgrass, and Indian grass). Interspersed within this Longleaf Pine Ecosystem is a diverse array of mixed forests on the lower slopes of ridges, extending into the streams. Hardwood bottomlands, drainages, seeps, and bogs will perpetuate subtle to major hydrologic differences in the uplands. Many stream courses will portray characteristics of the mixed forest ecosystem, although frequent fires on the uplands will limit the development of these mixed forest communities to the very wettest and widest riparian areas. Narrow stream courses and wetlands will develop an open aspect similar to the upland communities. These inclusions create transitions that begin with pure longleaf pine, grading to mixed species such as loblolly, shortleaf, and oaks, then gradually transcend into bottomland hardwood areas along larger streams.

For the Northern and Mid-Coastal Plains, Western Transition Coastal and Sandhill Subsections (Clayey Uplands, Redlands, and the Lignitic Uplands LTA's) on the northern Sabine NF.

Over this landscape you will view open shortleaf pine forests with a mix of oak and hickory trees situated on hills having deep sandy or red clay soils. Ridgetops and upper slopes of droughty

hills will be dominated by the Shortleaf Pine-Little Bluestem Communities. More moderate rolling terrain and side slopes with less droughty, loamy soils will be dominated by the Shortleaf-Oak-Hickory Communities. The understory vegetation on the dryer hilltops is dominated by fire tolerant shrub and perennial grasses (primarily little bluestem). Woody understory species such as yaupon, sumac, and greenbrier are more prevalent on lower slopes and loamy soils. Interspersed within this Shortleaf Pine Ecosystem are mixed loblolly and hardwood forests (on the lower slopes of ridges extending into the streams). Some hardwood bottomlands will provide hydrologic and plant community diversity.

Objective

The long-term population objective for the NFGT is 1,385 active RCW clusters (541 on the Sam Houston, 330 on the Davy Crockett, and 514 active clusters on the Angelina [includes MA-6 Longleaf Ridge] and Sabine National Forests)

Goals

Provide a range of mature pine forest habitats that allow populations of threatened, endangered, or sensitive species dependent on these communities to flourish.

Provide the best possible habitat for recovery of RCW populations and sub-populations, while allowing maximum potential for effective dispersal and social interaction of individuals between clusters.

Standards and Guidelines

MA-2-21 Utilize prescribed fire to control midstory, promote open upland forest communities, and to reduce fire hazard.

- a. Specific frequency, season, and prescription for burning in any area may vary depending upon vegetation, site and weather conditions, and RCW management priorities.
- b. Burn cycles should control encroaching vegetation while minimizing risk to cavity trees
- c. Cavity trees will be protected during burning operations
- d. Plow lanes will not be constructed within 200 feet of cavity trees unless needed to protect the cavity trees during an emergency.
- e. Emphasis is on growing season burning in habitat that was historically maintained by growing season fires

MA-2-22 Wildfire suppression response may be confinement, containment, or control with the primary objective of protecting RCW cavity trees.

MA2-80-3.2.3 Prescribed burning on a two to five year rotation is the preferred method to control midstory vegetation. In stands with dense, but small (less than two inches diameter) hardwood midstory more frequent burning may be necessary to achieve control.

In clusters, replacement or recruitment stands where hardwood midstory is too large to be killed by prescribed burning (greater than two inches diameter), the following methods may be used to remove midstory.

Mechanical methods such as a feller-buncher, hydro-ax, drum chopper, mulcher, shearing blade, ect.

Manual methods such as chainsaws, brush hooks, etc.

Herbicides applied by injection, hypo-hatchet, hand sprayer, etc.

Or a combination of these methods.

Maintenance burns for clusters, replacement and recruitment stands, which have already had the midstory removed, will receive priority.

Emphasize growing season burns in those habitats that were naturally maintained by growing season fire. After midstory is controlled and the native herbaceous vegetation re-established, burn during other seasons.

MA-2-80-3.3.3 Cavity Tree Protection During Prescribed Burning Operations

Burning prescriptions and cycles must minimize risk to cavity trees.

Cavity trees must be protected by raking away or back burning adjacent fuels, use of fire retardants, etc.

Plow lines will be kept 200 or more feet from cavity trees unless an emergency or site specific circumstance such as location of a property boundary, etc, dictate the need to locate them closer. If conditions dictate plow lines be placed within 200 feet of cavity trees, use of a dozer blade to lightly scrape away fuels is preferable to using a deep cutting plow.

MA-2-80-4.4 Prescribed Burning (Management in HMA)

Outside clusters, replacement and recruitment stands: the objective is midstory reduction (not total elimination) using primarily prescribed burning.

Establish a burning cycle of two to five years HMA-wide. In stands where fire has been excluded for many years, annual burning may be necessary to significantly reduce midstory.

Emphasize use of growing season burns in ecologically appropriate areas. Recognize, however, that habitat goals may require burning whenever conditions permit.

All burning prescriptions will be based on site specific conditions, including vegetation, site and weather conditions, and RCW management problems.

Use natural firebreaks (streams, roads, swamps, etc) whenever possible to reduce impacts of constructing firelines.

Management Area 4 Streamside Management Zones

- - **Desired Conditions** The NFGT has approximately 49,800 acres in this management area and includes the bed, bank, and water resources of the rivers, perennial and intermittent streams, wetlands, and their adjacent land areas. This Management Area also includes shorelines of perennial water bodies and areas adjacent to these shorelines. This area occurs in all ecological units on the National Forests and Grasslands in Texas (NFGT), but is sometimes described as riparian and bottomlands land LTA. Throughout this management area you will see some of the most diverse and productive areas on the Forest. This management area provides contiguous and diverse habitat for riparian and wetland dependent species. Stream channels will remain stable providing suitable water quality. Limited manipulation of vegetation will filter sediment, thus maintaining aquatic habitat for those dependant species. Vegetation left within the management area will provide a continuous source of organic matter, which contributes to the soil building process. The desired future condition of vegetation groups will be described within these stream course definitions.

- - **Rivers, Sloughs and Swamplands.** Baldcypress-Water Tupelo Series is a deciduous swamp forest that occupies some hydric soils in East Texas. Bald cypress and/or tupelo gum tend to dominate, but composition will depend on water depth, duration of flooding, and disturbance. This community is often dense canopied, dominated by Bald Cypress and Water Tupelo with some red maple, ash, water locust, and swamp black gum. Standing water is present for much of the year.

- - **Perennial Streams with Floodplain Forest.** Floodplain forest will most typically occur in well defined terraces along rivers and larger streams of the Forest and Caddo National Grassland. Floodplain Forest include the more hdyric **Overcup Oak Series**, the traditional **Water Oak-Willow Oak Series**, and the well-drained **Swamp Chestnut Oak-Willow Oak Series**. Red maple, water hickory, and willow oak are usually intermixed in the **Overcup Oak** community. Sweetgum, cherrybark oak, ash, and overcup oak with ironwood, eastern hophornbeam, deciduous holly, and Florida maple in the understory can be found in **Water Oak-Willow Oak Series**. Sweetgum, overcup oak, and cherrybark oak in the overstory with dwarf palmetto in the understory can be found in the **Swamp Chestnut Oak-Willow Oak Series**.

- - **Floodplain Forest Intermittent Streams.** Intermittent streams in both Forest and Grassland landscapes will develop on well drained streamcourses. These streamside zones may be difficult to distinguish from the adjacent upland areas due to a vegetation mix of species, especially if the surrounding uplands are oak-hickory or oak-pine type. The floodplain and topographical situation will help define this area, and in the more mesic intermittent streams, species from the periodically flooded perennial streams or **Floodplain Forest** areas may occur.

- **Mesic Forest Intermittent Streams.** Intermittent Streams developed on side slopes and areas between uplands and stream bottoms. Desired natural condition will be a multi-aged forest with many large-sized individuals. There is usually a rich assemblage of lichens, mosses and liverworts on soil, fallen logs, stumps, shrubs, and trees.

-

- **Inclusional Wetlands.** These inclusional communities will be associated with the longleaf pine landscape of the Mayflower and Sandy Uplands LTA. Composition in Sweetbay Magnolia Series; include gallberry holly, black titi, waxmyrtle, red maple, button bush, swamp gum, laurel greenbriar, and possumhaw viburnum. These sites are often associated with the Sphagnum-Beakrush Series (bogs). At times referred to as “baygall”, these areas could form a dense evergreen shrub thicket.

- **Objectives**

- This area will be managed to provide diverse stands of hardwoods and some pines, with a wide variety of understory vegetation. The water bodies such as lakes, perennial wetlands and associated areas contribute to the diversity and dispersion of native animals and plants with in each drainage, these drainages connect to the larger watersheds found throughout the NFGT. These linkages provide dispersal for populations of fish, wildlife and plants. This Management area will be managed to meet the recommendations in the Texas Wetlands Plan (TPWD 1988) and Best Management Practices (BMP) established by the state.

Primary objectives to manage for:

- * Maintenance of high quality water and abatement of downstream flooding.
- * Enhancement of all associated resources.
- * Protection of aquatic, riparian habitat, and special plant communities.

Secondary objectives to manage for:

- * Dispersion for animal and plant species by maintaining connecting habitat among mature and old growth stands of trees,
- * Maintenance or improvement of mast-producing wildlife habitat,
- * Recreation and scenic use compatible with other riparian management objectives, and,
- * Special wildlife habitat needs such as for threatened and endangered species, raptor nests and perches, and nests/dens for cavity dependent species.

The actual streamside riparian management area boundaries shall be identified as an Intermittent Stream or Perennial Stream. Determination of those classifications shall be by an onsite reconnaissance of topographic and biotic features, or as determined by the Forest Soil Scientist, Botanist or Hydrologist during site-specific environmental analysis.

A Primary Zone and a Secondary Zone will be identified within the Stream Side Management Zone (SMZ). The primary zone will be a 50-foot protection zone to ensure primary objectives of the area are achieved. This primary zone will extend from the stream channel edge outward 50 feet on either side of the stream. The secondary zone will be delineated from the primary zone

outward to the extent of the SMZ to achieve objectives of this zone. The outer edge of the SMZ will vary depending on both biological and physical factors within the LTA, historical use and topographical position.

Standards and Guides

MA-4-31 Prescribed fire may be used to enhance riparian vegetation or wildlife habitat.

- a. Encourage the use of green lines, wet lines, or foam lines rather than plowed firelines. Minimize the amount of plowed fireline which might impair the hydrology of the riparian ecosystems. Generally plowed firelines will not be allowed within the primary zone,
- b. Prescribed fire will generally not be used in large riparian areas,
- c. Low intensity backing fires may be used in smaller streamside zones,
- d. Fire maintained wetlands, baygalls, and bogs should be burned frequently to meet the desired future condition.

MA-4-32 The appropriate wildfire suppression response may be confinement, containment, or control.

Management Area 5 Major Aquatic Ecosystems

This management area prescription applies to the 15,682 acres of lakes, reservoirs and the lands inundated by them at normal pool level. They are:

Angelina and Sabine National Forests:

USFS Lands Inundated

By Sam Rayburn Reservoir - 9,427 acres

Desired Conditions

Both submergent and emergent vegetation are maintained for fish and wildlife habitat. Shorelines are managed by the U. S. Forest Service according to this and other management area prescriptions to maintain a natural appearance.

Objectives

These areas provide a range of settings offering clean water, wildlife habitat, hunting, fishing and other recreational opportunities dependent on aquatic environments, with access from adjacent developed or primitive recreation areas. A portion of perennial streams, draining into these areas, support native fish populations that can provide fishing opportunities and riparian dependent species, such as waterfowl, that can provide hunting and wildlife viewing opportunities.

Goals

- * Maintain high quality, functioning aquatic ecosystems,
- * Maintain water quality sufficient to meet Clean Water Act and Texas Water Standards,
- * Minimize risks of downstream flooding,

* Maintain viable populations of native fish and aquatic dependent wildlife species which would be found in man-made reservoirs,

* Provide a safe, healthful, aesthetic, non-urban aquatic environment for the pursuit of natural resource-based recreation.

Standards and Guides

See Forest-wide Standards and Guides.

Management Area 7 Wilderness

The Indian Mounds Wilderness is found on the Sabine NF.

Desired Condition

Lands within this management area are administered to maintain or achieve a natural state. The area is generally maintained in a natural condition by allowing physical and biological processes to operate without human intervention. Activities are integrated in such a way that current human use leaves only limited and site-specific evidence.

Within wildernesses, the enduring resource of wilderness is maintained and perpetuated as one of the multiple uses of National Forest System land. Wilderness character and public values are protected and perpetuated including, but not limited to, opportunities for scientific study, solitude, education, physical challenge and stimulation, inspiration, and primitive recreation experiences.

The vegetation is primarily the result of natural succession and processes. Ecosystems are relatively unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces. The forest cover retains the primeval character of the environment.

Goals and Objectives

Restore fire to its natural, ecological role. Reduce the risks and consequences of wildfire within wilderness or escaping from wilderness. Preserve wilderness character and associated values. Provide for human safety.

Standards and Guides

MA-7-41 Fires should be prevented from threatening or causing damage to human life and adjacent non-wilderness property.

MA-7-42 Fires are managed in accordance with an approved Fire Management Plan for each wilderness.

MA-7-43 Prescribed fire may be used to manage wilderness as determined through site specific environmental analysis. Prescribed fire plans should address:

- a. The role of natural fire in fire dependent or related ecosystems, and

b. Fuel loadings which are a fire risk to resources and values outside the wilderness.

MA-7-44 Favor suppression methods and equipment that cause the:

- Least alteration of the wilderness landscape;
- Least disturbance of the land surface;
- Least disturbance to visitor solitude;
- Least reduction of visibility during periods of visitor use;
- Least effects on other air quality-related values.

MA-7-45 Mechanical equipment may be used in wildfire suppression in accordance with Forest Service Manual direction.

MA-7-46 Firelines shall be rehabilitated as soon as possible after controlling wildfires.

MA-7-47 A prescribed fire action plan for each wilderness will identify the specific areas where prescribed fire can be applied to reduce fuel loading so that outside resources may be protected and maintain a fuel level that would allow fire to play its natural role.

Management Area 8a Research Natural Area (RNA)

This Management area includes the 225 acre Mill Creek Cove Scenic Area on the Sabine N.F. This area was recommended as a RNA because of its American Beech-Southern Magnolia sensitive plant communities.

Desired Conditions

Plant and animal communities native to the area evolve with little or no impact from humans. The forest and woodlands appear as a mix of many species of some young, but primarily old trees with areas of native tallgrass prairie. Some areas may show signs of recent wildfires or insect or disease outbreaks. In these areas you will see dead standing and down trees with patches of bark and branches missing and brown needles or leaves. These trees may have cavities in them and show small holes that are the signs of woodpeckers or other animals and insects.

Objectives

Research natural areas are managed for non-manipulative research, observation, and study. RNAs serve as control areas for comparing results from manipulative research, and for monitoring effects of resource management techniques and practices.

Goals

- * Comparison with those lands influenced by man.
- * Provision of educational and research areas for ecological and environmental studies.
- * Preservation of gene pools for typical as well as rare and endangered plants and animals.

Standards and Guides

MA-8e-31 Limit suppression strategies, practices and activities to those which have minimal impacts to RNA values. Extinguish wildfires endangering the RNA.

MA-8a-32 Avoid using chemical fire retardants.

MA-8a-33 If fire is used to perpetuate a seral or successional stage, it should mimic a natural fire, but with prudent measures to avoid a catastrophe.

Managed or naturally occurring fire may be used to perpetuate a desired series of plant formation or changes.

MA-8a-34 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of the RNA.

Leave fire-caused debris for natural decay.

Management Area 8c Scenic Areas

Beech Ravines (1,020 acres) and Upper Colorow Creek Scenic Area (230 acres) is found on the Sabine N.F.

Desired Conditions

A mesic uplands adjacent to slopes hardwood species increase in size, abundance, and overall dominance. Evidence of fire will fade and leaf litter will become increasingly thick on the ground.

Objectives

Management is directed toward maintaining and perpetuating the mesic species found in Beech Ravines and Upper Colorow Creek.

Goals

Not Listed

Standards and Guides

MA-8c-31 Limit suppression strategies, practices and activities to those which have minimal impacts to Scenic values. Extinguish wildfires endangering Scenic Areas.

MA-8c-32 Use no chemical fire retardants during fire suppression.

MA-8c-33 If fire is used to perpetuate a desirable vegetative condition, it should mimic a natural fire, but with prudent measures to a avoid catastrophe.

MA-8c-34 Allow fuels to accumulate at natural rates unless they threaten the objectives of Scenic Areas.

Leave fire-caused debris for natural decay

MA-8c-35 Develop fire management plans and obtain Forest Supervisor’s approval before prescribed ignitions occur.

Use prescribed fire to manage or maintain the scenic and botanical character through appropriate successional stages for which the area has been designated.

Standards and Guides for Upper Colorow Creek

MA-8c-D1 Prescribed fire will not be used within the boundaries of this site. Wildfire suppression strategies should be limited to non-mechanical techniques.

Management Area 8d Natural Heritage Areas

List of Natural areas on the Sabine NF

Site	Acres	Landtype Association
Fox Hunters Hill	451 acres	Mayflower Uplands
Matlock Hills	215 acres	Redlands
San Augustine Sandhills	136 acres	Redlands
Sandy Creek	160 acres	Redlands
Sixmile Creek	299 acres	Clayey Uplands
Stark Track	448 acres	Mayflower Uplands
Surprise Beech	130 acres	Lignitic Uplands
Crooked Creek	4 acres	Clayey Uplands
Cypress Creek	66 acres	Lignitic Uplands
East Hamilton Ravine	4 acres	Redlands
Mason Creek	6 acres	Lignitic Uplands

Desired Conditions

For sites in Lignitic Uplands, Redlands, and Clayey Uplands the more mesic sites will have mesic hardwood tree species in the lower slopes and along drainages. Evidence of fire will fade and leaf litter will become increasingly thick on the ground. For sites in Mayflower Uplands, Sandy Uplands, and Clayey Uplands, have stands of mixed pine-oak nearly pure longleaf pine, which dominate the overstory upland portions of these areas.

Objectives

Enhance, and promote sustainable populations of unique plants or plant communities.

Goals

In these areas, the natural disturbance effects of fire, weather, and erosive action should be allowed to work unimpeded. Allow frequent fire return intervals to enhance the species composition of fire maintained communities. Fires should be allowed to burn throughout the area and not be limited to specific sites, to allow natural plant community variability and ecotones to reestablish.

Standards and Guides

MA-8d-31 Limit suppression strategies, practices, and activities to those which have minimal impacts to botanical values. Extinguish wildfires endangering the area.

MA-8d-32 Use prescribed fire to manage or maintain the botanical character and successional stages for which the area has been designated unless restricted in certain plant communities as defined in specific botanical areas.

MA-8d-33 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of the area.

Leave fire-caused debris for natural decay

Management Area 8e Special Bottomland Areas

Beer Creek area (665 acres) south of Pineland, Texas on the Sabine N.F.

Desired Conditions

This management area retains its unique characteristic and is maintained in a natural to near-natural setting of riparian bottomland hardwoods

Objective

Management practice do not alter the natural landscape.

Goals

Emphasis is placed on improving and maintaining the riparian characteristics of the bottomland hardwood component for potential old-growth characteristics and wildlife habitat values associated with the ecosystem.

Standard and Guides

MA-8e-21 Prescribed fire may be used for vegetative manipulation within the area and must conform to specific action that would protect or enhance the aesthetics, wildlife, or riparian characteristics of the area.

MA8e-22 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on defined values.

Management Area 8f Cultural Heritage Areas

Description

Archeological and Historic Areas - A unit of land possessing features, sites, or a concentration of sites, buildings, structures, or objects united historically or prehistorically by plan or physical development, and which have been determined to be significant to our understanding of the prehistoric and historic occupation and utilization of the lands in which they are located

Desired Condition

The historical integrity of the sites are maintained so that the scientific and educational values are retained.

Objective

Not Stated

Goals

Not Stated

Standards and Guides

MA-8f-31 Manage fire and fuels through suppression practices, management of ignited prescribed fire, and vegetation manipulation to protect the values for which the area is designated or to maintain or restore natural conditions.

MA-8f-32 Accomplish fire suppression and fuels management without the use of heavy equipment or fire plows in those areas where their use would endanger the historical or contextual integrity of site feature or cultural deposits.

Management Area 9a Developed Recreation Sites

On the Sabine N.F. the developed Recreation Sites are: Indian Mounds, Lakeview, Ragtown, Red Hills Lake, Willow Oak, Boles Field and Haley's Ferry.

Desired Condition

Areas and sites developed with recreational user facilities to enhance camping, picnicking, swimming, boating, and fishing for National Forest visitor's interpretation and enjoyment of using the Forest and Grassland environments are emphasized.

Objectives

Facilities will be as natural, simple, and unobtrusive as possible. When possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals.

- * Provide a safe, healthful, aesthetic, non-urban atmosphere for the pursuit of natural resource based recreation.
- * Provide facilities and improvement at an appropriate level of accessibility, consistent with resource protection needs and anticipated user demand.
- * Provide opportunities for meaningful recreation experiences consistent with user demand and expectation.

Standards and Guides

MA-9a-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9a-42 Suppression strategies, practices and activities shall be limited to those which have minimal effects on developed recreation values.

MA-9a-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 9b Minimally Developed Recreation Sites

Desired Conditions

Most areas have a low development scale with few amenities provided. These areas provide a wide spectrum of forest and rangeland settings offering a range of recreation opportunities.

Objective

Facilities will be as natural, simple, and unobtrusive as possible, when possible management will favor a gradual succession to natives species. To provide quality recreation facilities.

Goals

- * Provide facilities and improvements, consistent with resource protection needs, anticipated user demand, and compatible with management goals for the surrounding area, to support specialized and dispersed recreation use on the Forest and,
- * Provide a safe, healthful, aesthetic atmosphere for the pursuit of natural, resource based recreation.

Standards and Guides

MA-9b-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9b-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

Ma-9b-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 10b Special Use Permit Sites: Example Utility Corridors

Desired Condition

The desired future condition is a pattern of special uses established to provide facilities, services, or opportunities that are in the general public interest.

Objective

When feasible, special uses are combined in a single corridor rather than developing parallel corridors.

Goals

- * Provide safe, efficient facilities and improvements in an environmentally sensitive manner
- * Authorize only those occupancies which promote and support the general public welfare, and do not conflict with law and Forest Service policy, and
- * Minimize inconsistency with surrounding land uses and minimize the adverse impacts of these uses on other resources

Standards and Guides

See Forest Wide

3.2.3. D FMU Characteristics

3.2.3.1. D Safety

- **Flora and Fauna:** Texas is home to numerous plants and animals that could pose a safety risk to firefighters; the list includes poisonous snakes, wasps, biting insects (ticks and chiggers), and poison ivy to name just a few. The southern rough fuel type present in Texas is called the “Big Thicket” for a reason. Numerous thorny vines and briars are present in Texas and can make cross country travel difficult.
- **Snags:** Texas has been hit by several wind events and hurricanes over the last 10 to 15 years which has produced numerous snags that could pose a threat to firefighters and the general public and make fires harder to contain.
- **Environmental Conditions:** Texas is known for long, hot, humid, summer months that can lead to illness caused by overheating. During its short winter season Texas can also experience periods of freezing temperatures and the occasional ice storm or snow storm.

3.2.2.2D Physical

- The FMU is located approximately 60 miles east of Lufkin, TX, near the towns of Shelbyville, Hemphill, and San Augustine. The FMU lies next to Toledo Bend Reservoir and the state line of Louisiana. The FMU boundary coincides with the Sabine NF proclamation boundary.
- **Topography:** The Topography is flat to gently rolling. The average slopes ranges from 0 to 5% though in some cases slopes can be as steep as 15 to 30%.
- Elevation ranges from 150 to 500 feet above sea level.

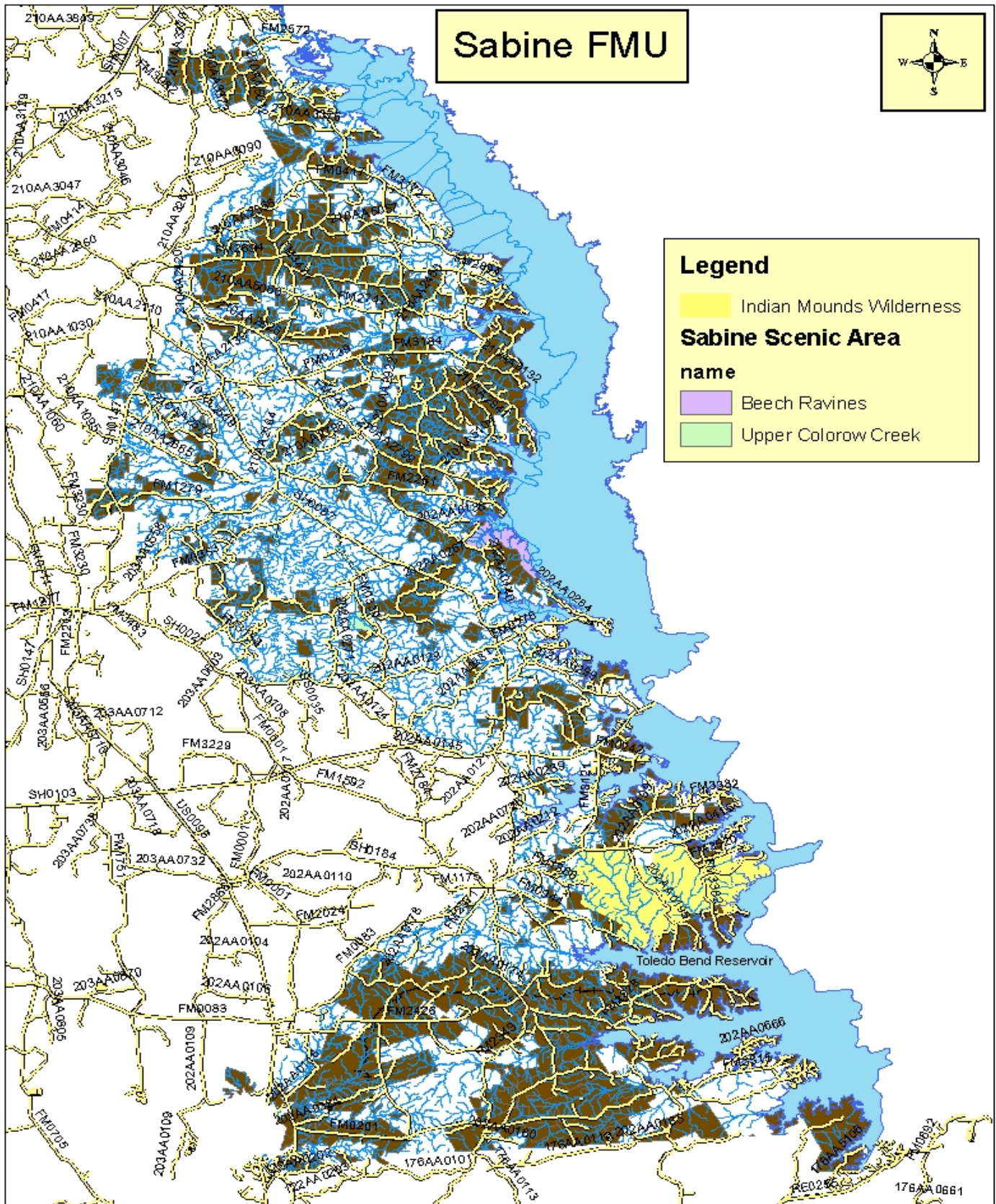


Figure 1: Sabine FMU**3.2.3.3. D Biological****Ecological Systems**

Table 1 list the landtype phases or ecological classification system classifications found on the Sabine FMU. An ecological classification system classifies land into ecologically equivalent units on the basis of an integration of multiple components of the forest ecosystem including soils, physiography, and vegetation. A land classification based on these components reflects the influence of environmental characteristics of a site, and it gives information about its inherent ecological potential and types of living communities it will support.

Desired Ecological Systems for the Sabine FMU**Table 1:** Approximate Acres for Landtypes phases.

Landtypes Phases	Approximate Acres
American Beech-White Oak/Mitchella Loamy Moist-Mesic Steep Slopes and Ravines	13737
Baldcypress/Ceratophyllum Semi-Permanently Flooded Swamps	1635
Longleaf Pine/Schizachyrium Clayey Dry-Mesic Uplands	3580
Longleaf Pine/Schizachyrium Loamy Dry-Mesic Uplands	5023
Longleaf Pine-Blackjack Oak/Schizachyrium Arenic Dry Uplands	4166
Longleaf Pine-Bluejack Oak/Tragia Grossarenic Dry Uplands	434
Overcup Oak/Justicia Clayey/Loamy Seasonally to near Regularly Flooded Low River Floodplains	1044
Shortleaf Pine (Longleaf Pine)-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	99557
Shortleaf Pine-(Longleaf Pine)-Blackjack Oak/Schizachyrium Arenic Dry Uplands	6266
Shortleaf Pine-(Longleaf Pine)-Bluejack Oak/Tragia Grossarenic Dry Uplands	672
Shortleaf Pine-Blackjack Oak/Schizachyrium Arenic Dry Uplands	1043
Shortleaf Pine-Bluejack Oak/Tragia Grossarenic Dry Uplands	58
Shortleaf Pine-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	5846
Shortleaf Pine-Post Oak/Chasmanthium Clayey Dry-Mesic Uplands	3659
Small Stream and Riparian	5706
Sweetbay-Swamp Tupelo/Osmunda Loamy Wet Forested Seeps	216
Temporarily Flooded Bottomland	9229
Weches or Shortleaf Pine-Post Oak/Chasmanthium Clayey Dry-Mesic Uplands	459
White Oak-Loblolly Pine/Callicarpa Loamy Mesic Lower Slopes and Terraces	1057
Willow oak/Justicia Clayey Wet Upland Depressions	7554

3.2.2.4. D Resources (Wildland Urban Interface, Special Areas, and Recreation Resources)

- **Wildland Urban Interface**

The Sabine FMU has extensive urban interface. It is broken up into numerous blocks that are surrounded by houses and associated private development.

- **Special Designations**

Table 2: Special Area

Special Areas within FMU	Acres
Beech Ravines Scenic Area	1,020
Upper Colorow Creek Scenic Area	230
Beer Creek Area	655
Indian Mounds Wilderness	12,479

- **Recreation**

Trail System
Camping
Boating

Table 3: List of Recreation areas on the Sabine FMU

Name	Type		Name	Type
BOLES FIELD	CAMPGROUND		LAKEVIEW	CAMPGROUND
EAST HAMILTON	BOATING SITE		RED HILLS LAKE	CAMPGROUND
HALEY'S FERRY	BOATING SITE		RAGTOWN	CAMPGROUND
WILLOW OAK	CAMPGROUND		INDIAN MOUNDS	CAMPGROUND

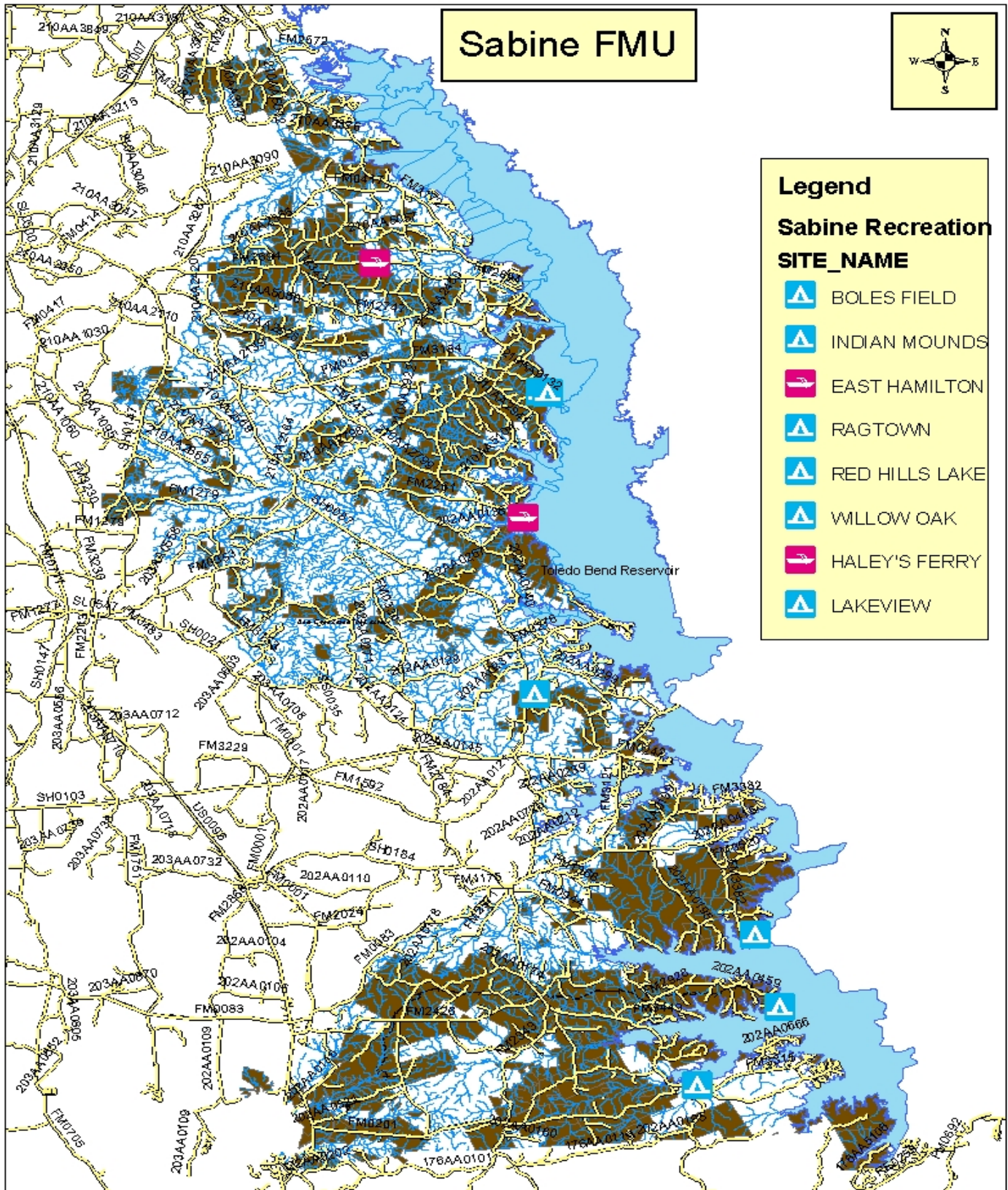


Figure 2: Sabine FMU Recreation Sites

3.2.4. D FMU Fire Environment

The Sabine has an aggressive prescribe burn program with much of the area on a 2- 5 year burn rotation. The district personnel burn 20,000 to 40,000 acres a year. Extensive areas of fire dependent upland pines habitat can be found, noticeably in conjunction with RCW management areas. In areas that have not been treated with fire for several years, a build up of fuels has developed that includes volatile plant components and ladder fuels that can lead to more extreme fire behavior under certain conditions.

3.2.4.1. D Fire Behavior

The following Fuel Models are found on the Sabine NF.

Table 5: Fuel Models Present on the Sabine FMU (Source; Landfire)

Fuel Model With approximate acres	Fire Behavior Notes
GR3 499 acres	Primary carrier is grass, very little shrubs present. Average depth 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GR5 53 acres	Dense short grass, very little shrubs present. Average depth 1 to 2 feet. Spread rate can be high (twice as much as GR3) as can flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GS3 821 acres	A mixture of grass and shrubs. Moderate fuel loading, average depth less than 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Can have higher flame lengths as compared to GR3. Moisture of extinction is 30 to 40 percent. Found in areas that have been treated repeatedly with fire. Typically has a pine or hardwood overstory.
SH3 2308 acres	Pine overstory with a shrub understory, moderated fuel load, average depth 2 to 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent.
SH4 22790 acres	Pine overstory with a shrub understory, low fuel load, average depth 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent. When live herbaceous is fully cured can have a very high rate of spread much higher than SH3 and moderate flame length.

National Forests and Grasslands in Texas

TL2 42928 acres	Pine overstory with a compact leaf litter, low fuel load, average depth 1 to 2 inches. Typical of a one year old rough. Spread rate low flame length low. Moisture of extinction is 25 percent.
TL6 102515 acres	Pine overstory with a moderate fuel load, average depth 2 to 4 inches. Spread rate moderate . Moisture of extinction is 25 percent.
TU3 2659 acres	Pine or Oak Savanna with a moderate forest litter load and grass and shrub components. Spread rate is high, flame length is moderate. Moisture of extinction is 30 percent.

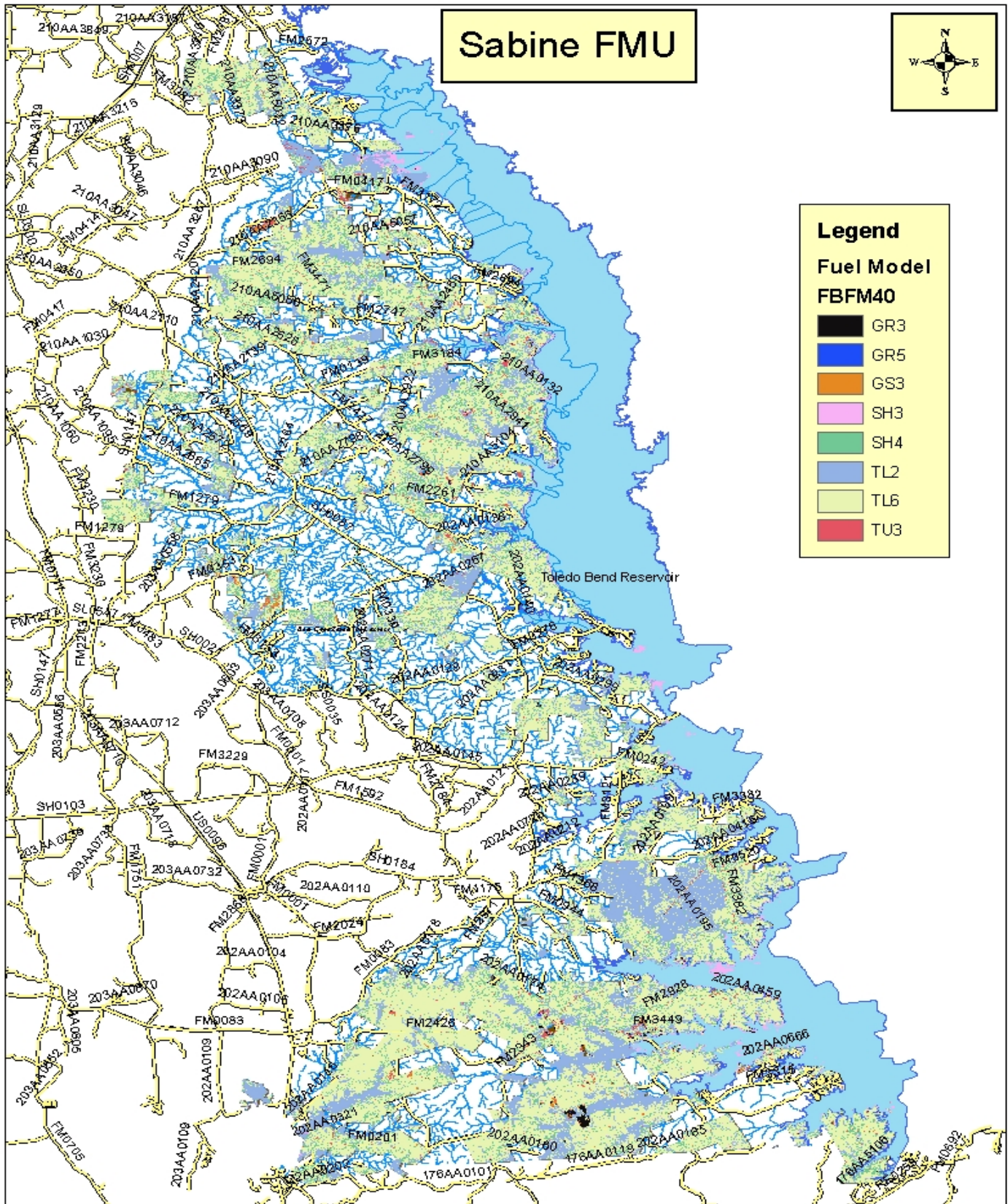
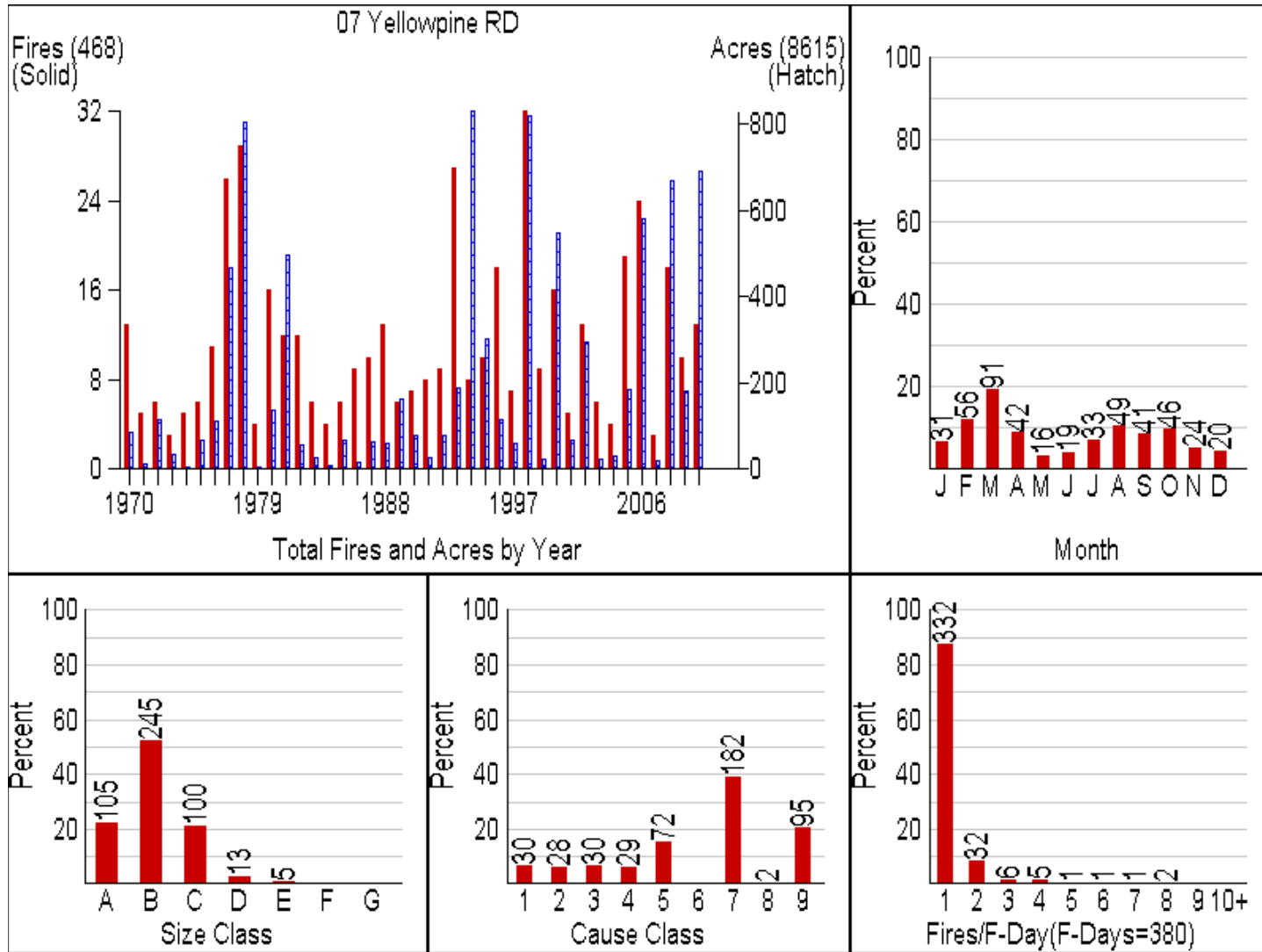


Figure 3: Map showing Fuel Model Distribution on the Sabine FMU

Historical Wildfire Fire Occurrence

The Sabine FMU had 468 fires between 1970 and the start of 2011. This is an average of 12 wildfires a year. Most of the fires occur in the Spring and late Summer but fires can occur year round. The largest fire was 580 acres and occurred on 1/04/1994. Most of the fires were arson caused with some limited lightning caused fire. Approximately one fire per year start from lightening.

Table 6. Sabine Fire Occurrence



Size Class A = 0.0 to 0.25 ac; B = 0.26 to 9.9 ac; C = 10.0 to 99.9 ac; D = 100.0 to 299.9 ac; E = 300.0 to 999.9+ ac.

Cause Class: 1 = Lighting, 2 = Equipment, 3 = Smoking, 4 = Campfire, 5 = Debris Burning, 6 = Railroad, 7 = Arson, 8 = Children, 9 = Miscellaneous

3.2.4.2 D Weather

The winter is generally the driest time of the year with the greatest wind event potential and low relative humidity's behind passing storms, though widespread precipitation can also occur. During the spring the potential for windy and dry events diminishes steadily from south to north as the jet stream retreats. Shifts in the jet stream allows warm, moist air masses arising from the Gulf of Mexico to become increasingly dominant. The summer is generally warm to hot and humid with light winds under the Bermuda High influence. Critical drying can occur if the high becomes centered over land and becomes modified. A period of peak tropical cyclone activity begins late in the summer, bringing the potential for windy/dry conditions in advance of any storms followed by copious moisture. The fall brings a continuance of the tropical cyclone season early, then dry air intrusion and the potential wind events return with the southward shift in the jet stream. Moist conditions often persist along the Gulf Coast through fall.

Other climate factors that influence Texas weather include the Mexican High Plain, or Altiplanicie Mexicana. This arid, high-altitude plateau region extends northward from Mexico City nearly to the United States border. Rarely does this air reach ground level in Texas except in the Trans-Pecos region, but it influences the weather throughout the State. When surface winds in Texas are from the south or southeast, winds 10,000 feet above ground are normally from the southwest. Thus, low-level air from the Gulf of Mexico is overlaid with warmer, drier air from the Mexican High Plain. Close to the Mexican border, this warm air 'caps' the humid Gulf air, preventing thunderstorm activity and trapping the humid air close to the ground. As the air masses precede north, particularly during the spring and fall, they progressively move beneath cooler air aloft. While the humid low-level air becomes more unstable, it still cannot convect because of the capping inversion. Eventually, if a frontal system or other disturbance causes larger-scale ascent, the Mexican High Plain air can cool enough to eliminate the cap, suddenly allowing vigorous thunderstorm activity to take place. The combination of the Gulf of Mexico and the Altiplanicie Mexicana makes Texas and the southern Great Plains the worldwide hot spot for severe convection and tornadoes.

The Rocky Mountains also has an impact on the climate in Texas. Arizona, New Mexico, and west Texas form one of two relative gaps in the Rocky Mountain Cordillera; the other is along the United States-Canadian border. Westerly winds often blow through this gap, but the Rockies form a broad barrier to westerlies for the rest of the State. In the eastern half of Texas, the least likely wind direction is from the west. The Rockies also block air from moving across them from the east. In particular, cold air masses that reach the United States from the north cannot easily spread westward and instead are funneled southward parallel to the mountains. Such cold air reaches farther south into Texas and beyond than anywhere else on the continent.

Despite the threat of the rare snow or ice storm, winters in most parts of Texas are mild and pleasant. Sunshine averages at least 45 percent of maximum possible along the coast. In Houston, the growing season is 300 days long; in Dallas, 235. The latest freeze typically occurs after April 1st, in less than half the State.

May is typically the wettest month of the year and also has a high occurrence of tornados. Summer produces the most equitable distribution of rainfall. Thunderstorms are common in the State, but the departure of the jet stream to the

north means that severe thunderstorms are a rarity. Despite the continued rainfall, the high temperatures mean that normal evaporation exceeds precipitation in all areas of the State. Below-normal precipitation can cause significant environmental stress, and the State is most susceptible to drought during summertime as a result. The reduced evaporation from the soil and plants under drought conditions also causes temperatures to be just a little bit warmer, making the situation even worse.

The following was taken from the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center;
http://hurricane.ncdc.noaa.gov/climatenormals/clim60/states/Clim_TX_01.pdf, accessed April 27, 2011.

Table 7: Average Weather readings for East Texas

Lufkin	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation	4.45	3.17	3.53	3.13	5.29	4.18	2.6	3.08	4.08	4.13	4.54	4.44	46.62
Mean Temp	48.6	52.9	59.8	66.2	73.7	79.7	82.6	82.2	77.3	67.7	57.7	50.3	66.6

3.2.1 Fire Management Considerations for Specific Fire Management Units

3.2.1A FMU Snap Shot

- FMU Name: Sam Houston NF.
- FMU Number: 41
- Fire Behavior Indicator: BI
- NFDRS Weather Station: Cold Springs, Station ID, 414201
- Nearest Weather Station: Cold Springs, Station ID, 414201
- Acres/Agency: 161,670 acres, USFS
- Predominant Vegetation Types: Southern Rough, pine stands on relatively flat to rolling hills with sandy loams. The understory vegetation is dominated by woody shrubs and subdominant hardwood species. Hardwood bays can also be found throughout the FMU.
- IA assets assigned to this FMU: Three type 3 Dozers and one type 5 Engine
- Duty Officer: Brian Gidcumb DFMO or Jason Klwinsky DAFMO
- IA Dispatch Office: Texas Interagency Coordination Center
- Communities adjacent or within FMU: Houston, Huntsville, Richards, Coldspring, Shepherd, New Waverly, Cleveland

Options available for management response to wildland fires:

Management Actions allowed in this FMU

The response to wildfires in this FMU includes the full range of suppression strategies. “The suppression response may be confinement, containment, or control.” (NFGT LRMP 1996, pg. 64) Thus initial actions may include size-up, patrolling, monitoring, holding actions, or an aggressive initial attack.

Initial response to fires within the FMU will require an assessment as to what initial action to take. The FMO/IC begins this assessment immediately by evaluating the probable cause and location of the fire relative to the hazards to firefighters/public and the risk to natural resources.

Commensurate with the assessment, initial attack resources are dispatched to a fire under the assumption that the fire is to be managed to meet protection objectives unless directed otherwise. Human caused fires will be suppressed to meet protection objectives that minimize negative consequences with respect to firefighters and public safety.

Fire Managers and Line Officers will use the Wildfire Decision Support System (WFFDS) to guide and document wildfire management decisions. The WFFDS will provide situational assessment, analyze hazards and risks, define implementation actions, and document decisions and the rationale for decisions.

- **3.2.2A FMU Guidance**

- This section describes direction specific to the management areas (MAs) on the Sam Houston NF that coincide with the Sam Houston FMU. The goals, desired future conditions, objectives, standards and guidelines for the area make up the management area direction. The MAs are identified by number and name. Forest-wide goals, objectives, and standards and guidelines apply to all management areas unless specifically exempted or modified by the management area direction.

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- **Management Area 1: Upland Forest Ecosystems**

-

- **Desired Conditions**

For the Southwestern Gulf-Flatwoods (San Jacinto Flatwoods Land Type Association (LTA), Southwest Gulf Coastal Plain Subsection (Raven Hills and Big Thicket LTA's) on the Sam Houston National Forest. Over this landscape you will view open pine forests mixed with some hardwood species. These pine uplands are situated on relatively flat to gently rolling terrain. The clay loams and sandy loams of this area have excellent moisture holding capacity conducive to a wide range of tree and understory species. Historically, these areas were recognized for their excellent growth potential and were planted to a variety of tree species (some of which are still evident). The understory vegetation is dominated by woody shrubs and subdominant hardwood species. Interspersed within this ecosystem are stream courses that have a greater species composition of oak and hickory. Within this area the San Jacinto Flatwoods LTA occurs, an area described as inland hardwood bays. This level, mesic oak dominated habitat will be managed for the natural Water Oak-Willow Oak Community typical of this LTA.

- **Objectives**

This area is managed for regeneration and restoration of the Upland longleaf and shortleaf Forest Communities. Prescribed fires and their effects will be evident on many of the upland areas.

Goals

Provide opportunity for timber production, and mineral exploration and development while maintaining a predominantly natural appearing landscape, clean water, productive soil, little soil erosion, viable populations of wildlife, and habitat for threatened, endangered, or sensitive species of plants and animals.

Standards and Guidelines

Ma-1-31 Utilize prescribed fire to manage the various components of the ecosystems.

a. Fire frequency will generally range from three to seven years. More frequent burning may be required in certain plant communities, as prescribed by site-specific environmental analysis.

b. Emphasize growing season burning in habitat that was historically maintained by growing season fires

MA-1-32 Wildfire suppression response may be confinement, containment, or control.

Management Area 2: Red-cockaded Woodpecker (RCW) Emphasis

Desired Conditions

For the Southwestern Gulf-Flatwoods (San Jacinto Flatwoods Land Type Association (LTA), Southwest Gulf Coastal Plain Subsection (Raven Hills and Big Thicket LTA's) on the Sam Houston NF. Over this landscape you will view open pine forests mixed with some hardwood species. These pine uplands are situated on relatively flat to gently rolling terrain. The clay loams and sandy loams of this area have excellent moisture holding capacity conducive to a wide range of tree and understory species. Historically, these areas were recognized for their excellent growth potential and were planted to a variety of tree species (some of which are still evident). The understory vegetation is dominated by woody shrubs and subdominant hardwood species. Interspersed within this ecosystem are stream courses that have a greater species composition of oak and hickory. Within this area the San Jacinto Flatwoods LTA occurs, an area described as inland hardwood bays. This level, mesic oak dominated habitat will be managed for the natural Water Oak-Willow Oak Community typical of this LTA.

Objective

The long-term population objective for the NFGT is 1,385 active RCW clusters (541 on the Sam Houston, 330 on the Davy Crockett, and 514 active clusters on the Angelina [includes MA-6 Longleaf Ridge] and Sabine National Forests)

Goals

Provide a range of mature pine forest habitats that allow populations of threatened, endangered, or sensitive species dependent on these communities to flourish. Provide the best possible habitat for recovery of RCW populations and sub-populations, while allowing maximum potential for effective dispersal and social interaction of individuals between clusters.

Standards and Guidelines

MA-2-21 Utilize prescribed fire to control midstory, promote open upland forest communities, and to reduce fire hazard.

- a. Specific frequency, season, and prescription for burning in any area may vary depending upon vegetation, site and weather conditions, and RCW management priorities.
- b. Burn cycles should control encroaching vegetation while minimizing risk to cavity trees
- c. Cavity trees will be protected during burning operations
- d. Plow lanes will not be constructed within 200 feet of cavity trees unless needed to protect the cavity trees during an emergency.

e. Emphasis is on growing season burning in habitat that was historically maintained by growing season fires

MA-2-22 Wildfire suppression response may be confinement, containment, or control with the primary objective of protecting RCW cavity trees.

MA2-80-3.2.3 Prescribed burning on a two to five year rotation is the preferred method to control midstory vegetation. In stands with dense, but small (less than two inches diameter) hardwood midstory more frequent burning may be necessary to achieve control.

In clusters, replacement or recruitment stands where hardwood midstory is too large to be killed by prescribed burning (greater than two inches diameter), the following methods may be used to remove midstory.

Mechanical methods such as a feller-buncher, hydro-ax, drum chopper, mulcher, shearing blade, etc.

Manual methods such as chainsaws, brush hooks, etc.

Herbicides applied by injection, hypo-hatchet, hand sprayer, etc.

Or a combination of these methods.

Maintenance burns for clusters, replacement and recruitment stands, which have already had the midstory removed, will receive priority.

Emphasize growing season burns in those habitats that were naturally maintained by growing season fire. After midstory is controlled and the native herbaceous vegetation re-established, burn during other seasons.

MA-2-80-3.3.3 Cavity Tree Protection During Prescribed Burning Operations

Burning prescriptions and cycles must minimize risk to cavity trees.

Cavity trees must be protected by raking away or back burning adjacent fuels, use of fire retardants, etc.

Plow lines will be kept 200 or more feet from cavity trees unless an emergency or site specific circumstance such as location of a property boundary, etc , dictate the need to locate them closer. If conditions dictate plow lines be placed within 200 feet of cavity trees, use of a dozer blade to lightly scrape away fuels is preferable to using a deep cutting plow.

MA-2-80-4.4 Prescribed Burning (Management in HMA)

Outside clusters, replacement and recruitment stands: the objective is midstory reduction (not total elimination) using primarily prescribed burning.

Establish a burning cycle of two to five years HMA-wide. In stands where fire has been excluded for many years, annual burning may be necessary to significantly reduce midstory.

Emphasize use of growing season burns in ecologically appropriate areas. Recognize, however, that habitat goals may require burning whenever conditions permit.

All burning prescriptions will be based on site specific conditions, including vegetation, site and weather conditions, and RCW management problems.

Use natural firebreaks (streams, roads, swamps, etc) whenever possible to reduce impacts of constructing firelines.

Management Area 4 Streamside Management Zones

-
- **Desired Conditions**
- The NFGT has approximately 49,800 acres in this management area and includes the bed, bank, and water resources of the rivers, perennial and intermittent streams, wetlands, and their adjacent land areas. This Management Area also includes shorelines of perennial water bodies and areas adjacent to these shorelines. This area occurs in all ecological units on the National Forests and Grasslands in Texas (NFGT), but is sometimes described as riparian and bottomlands land LTA. Throughout this management area you will see some of the most diverse and productive areas on the Forest. This management area provides contiguous and diverse habitat for riparian and wetland dependent species. Stream channels will remain stable providing suitable water quality. Limited manipulation of vegetation will filter sediment, thus maintaining aquatic habitat for those dependant species. Vegetation left within the management area will provide a continuous source of organic matter, which contributes to the soil building process. The desired future condition of vegetation groups will be described within these stream course definitions.
-
- **Rivers, Sloughs and Swamplands.** Baldcypress-Water Tupelo Series is a deciduous swamp forest that occupies some hydric soils in East Texas. Bald cypress and/or tupelo gum tend to dominate, but composition will depend on water depth, duration of flooding, and disturbance. This community is often dense canopied, dominated by Bald Cypress and Water Tupelo with some red maple, ash, water locust, and swamp black gum. Standing water is present for much of the year.
-
- **Perennial Streams with Floodplain Forest.** Floodplain forest will most typically occur in well defined terraces along rivers and larger streams of the Forest and Caddo National

Grassland. Floodplain Forest include the more hydric **Overcup Oak Series**, the traditional **Water Oak-Willow Oak Series**, and the well-drained **Swamp Chestnut Oak-Willow Oak Series**. Red maple, water hickory, and willow oak are usually intermixed in the **Overcup Oak** community. Sweetgum, cherrybark oak, ash, and overcup oak with ironwood, eastern hophornbeam, deciduous holly, and Florida maple in the understory can be found in **Water Oak-Willow Oak Series**. Sweetgum, overcup oak, and cherrybark oak in the overstory with dwarf palmetto in the understory can be found in the **Swamp Chestnut Oak-Willow Oak Series**.

-

- **Floodplain Forest Intermittent Streams.** Intermittent streams in both Forest and Grassland landscapes will develop on well drained streamcourses. These streamside zones may be difficult to distinguish from the adjacent upland areas due to a vegetation mix of species, especially if the surrounding uplands are oak-hickory or oak-pine type. The floodplain and topographical situation will help define this area, and in the more mesic intermittent streams, species from the periodically flooded perennial streams or **Floodplain Forest** areas may occur.

-

- **Mesic Forest Intermittent Streams.** Intermittent Streams developed on side slopes and areas between uplands and stream bottoms. Desired natural condition will be a multi-aged forest with many large-sized individuals. There is usually a rich assemblage of lichens, mosses and liverworts on soil, fallen logs, stumps, shrubs, and trees.

-

- **Inclusional Wetlands.** These inclusional communities will be associated with the longleaf pine landscape of the Mayflower and Sandy Uplands LTA. Composition in Sweetbay Magnolia Series; include gallberry holly, black titi, waxmyrtle, red maple, button bush, swamp gum, laurel greenbriar, and possumhaw viburnum. These sites are often associated with the Sphagnum-Beakrush Series (bogs). At times referred to as “baygall”, these areas could form a dense evergreen shrub thicket.

-

- **Objectives**

- This area will be managed to provide diverse stands of hardwoods and some pines, with a wide variety of understory vegetation. The water bodies such as lakes, perennial wetlands and associated areas contribute to the diversity and dispersion of native animals and plants with in each drainage, these drainages connect to the larger watersheds found throughout the NFGT. These linkages provide dispersal for populations of fish, wildlife and plants. This Management area will be managed to meet the recommendations in the Texas Wetlands Plan (TPWD 1988) and Best Management Practices (BMP) established by the state.

Primary objectives to manage for:

- * Maintenance of high quality water and abatement of downstream flooding.
- * Enhancement of all associated resources.
- * Protection of aquatic, riparian habitat, and special plant communities.

Secondary objectives to manage for:

- * Dispersion for animal and plant species by maintaining connecting habitat among mature and old growth stands of trees,
- * Maintenance or improvement of mast-producing wildlife habitat,
- * Recreation and scenic use compatible with other riparian management objectives, and,
- * Special wildlife habitat needs such as for threatened and endangered species, raptor nests and perches, and nests/dens for cavity dependent species.

The actual streamside riparian management area boundaries shall be identified as an Intermittent Stream or Perennial Stream. Determination of those classifications shall be by an onsite reconnaissance of topographic and biotic features, or as determined by the Forest Soil Scientist, Botanist or Hydrologist during site-specific environmental analysis.

A Primary Zone and a Secondary Zone will be identified within the Stream Side Management Zone (SMZ). The primary zone will be a 50-foot protection zone to ensure primary objectives of the area are achieved. This primary zone will extend from the stream channel edge outward 50 feet on either side of the stream. The secondary zone will be delineated from the primary zone outward to the extent of the SMZ to achieve objectives of this zone. The outer edge of the SMZ will vary depending on both biological and physical factors within the LTA, historical use and topographical position.

Standards and Guides

MA-4-31 Prescribed fire may be used to enhance riparian vegetation or wildlife habitat.

- a. Encourage the use of green lines, wet lines, or foam lines rather than plowed firelines. Minimize the amount of plowed fireline which might impair the hydrology of the riparian ecosystems. Generally plowed firelines will not be allowed within the primary zone,
- b. Prescribed fire will generally not be used in large riparian areas,
- c. Low intensity backing fires may be used in smaller streamside zones,
- d. Fire maintained wetlands, baygalls, and bogs should be burned frequently to meet the desired future condition.

MA-4-32 The appropriate wildfire suppression response may be confinement, containment, or control.

Management Area 5 Major Aquatic Ecosystems

This management area prescription applies to the 15,682 acres of lakes, reservoirs and the lands inundated by them at normal pool level. They are:

***Sam Houston National Forest
USFS Lands Inundated
By Lake Conroe - 5,131 acres***

Desired Conditions

Both submergent and emergent vegetation are maintained for fish and wildlife habitat. Shorelines are managed by the U. S. Forest Service according to this and other management area prescriptions to maintain a natural appearance.

Objectives

These areas provide a range of settings offering clean water, wildlife habitat, hunting, fishing and other recreational opportunities dependent on aquatic environments, with access from adjacent developed or primitive recreation areas. A portion of perennial streams, draining into these areas, support native fish populations that can provide fishing opportunities and riparian dependent species, such as waterfowl, that can provide hunting and wildlife viewing opportunities.

Goals

- * Maintain high quality, functioning aquatic ecosystems,
- * Maintain water quality sufficient to meet Clean Water Act and Texas Water Standards.
- * Minimize risks of downstream flooding,
- * Maintain viable populations of native fish and aquatic dependent wildlife species which would be found in man-made reservoirs,
- * Provide a safe, healthful, aesthetic, non-urban aquatic environment for the pursuit of natural resource-based recreation.

Standards and Guides

See Forest-wide Standards and Guides.

Management Area 7 Wilderness

The Little Lake Creek Wilderness is found on the Sam Houston NF.

Desired Condition

Lands within this management area are administered to maintain or achieve a natural state. The area is generally maintained in a natural condition by allowing physical and biological processes to operate without human intervention. Activities are integrated in such a way that current human use leaves only limited and site-specific evidence.

Within wildernesses, the enduring resource of wilderness is maintained and perpetuated as one of the multiple uses of National Forest System land. Wilderness character and public values are protected and perpetuated including, but not limited to, opportunities for scientific study, solitude, education, physical challenge and stimulation, inspiration, and primitive recreation experiences.

The vegetation is primarily the result of natural succession and processes. Ecosystems are relatively unaffected by human manipulation and influences so that plants and animals develop and respond to natural forces. The forest cover retains the primeval character of the environment.

Goals and Objectives

Restore fire to its natural, ecological role. Reduce the risks and consequences of wildfire within wilderness or escaping from wilderness. Preserve wilderness character and associated values. Provide for human safety.

Standards and Guides

MA-7-41 Fires should be prevented from threatening or causing damage to human life and adjacent non-wilderness property.

MA-7-42 Fires are managed in accordance with an approved Fire Management Plan for each wilderness.

MA-7-43 Prescribed fire may be used to manage wilderness as determined through site specific environmental analysis. Prescribed fire plans should address:

- a. The role of natural fire in fire dependent or related ecosystems, and
- b. Fuel loadings which are a fire risk to resources and values outside the wilderness.

MA-7-44 Favor suppression methods and equipment that cause the:

- Least alteration of the wilderness landscape;
- Least disturbance of the land surface;
- Least disturbance to visitor solitude;
- Least reduction of visibility during periods of visitor use; and,
- Least effects on other air quality-related values.

MA-7-45 Mechanical equipment may be used in wildfire suppression in accordance with Forest Service Manual direction.

MA-7-46 Firelines shall be rehabilitated as soon as possible after controlling wildfires.

MA-7-47 A prescribed fire action plan for each wilderness will identify the specific areas where prescribed fire can be applied to reduce fuel loading so that outside resources may be protected and maintain a fuel level that would allow fire to play its natural role.

Management Area 8b Protected River and Stream Corridors

Winters Bayou found on the Sam Houston NF

Desired Conditions

A one-quarter mile corridor from each side of the rivers and any lands visible from them under Forest Service management exist in a natural to near-natural setting, and the rivers and channels are not modified in anyway.

Objectives

Management practices are designed so that the natural landscape appears unaltered.

Goals

- * Prevent modification of the free flowing characteristics of the identified rivers;
- * Protect, and to the extent practicable, enhance the outstandingly remarkable values of the identified river(s);
- * Preserve the eligibility and potential classification of the identified rivers.

These goals will be achieved through the following management related objectives:

- * Maintain a one-quarter mile corridor on each side of the river of high quality scenery and essentially an undeveloped shoreline;
- * Maintain and improve fish and wildlife habitat;
- * Provide opportunities for river-oriented recreation which are consistent with the largely undeveloped nature of the segment and dependent on free-flowing conditions;
- * Utilize other resources and permit other activities which maintain or enhance the wildlife habitat quality, river fisheries, scenic attractions, or recreation values.

Standards and Guides

MA-8b-31 Use prescribed fire for vegetative manipulation where necessary in fire dependent ecosystems to maintain or enhance desired conditions.

MA-8B-32 Suppression strategies, practices, and activities are limited to those which have minimal effects on scenic river values.

MA-8b-33 Suppress wildfires at the lowest acreage practicable. Prescribed natural fires may be allowed to burn within prescription in fire dependent ecosystems.

Management Area 8c Scenic Areas

Big Creek (1,920 acres) and Winters Bayou Scenic Area (1,587 acres) are found on the Sam Houston NF.

Desired Conditions

The vegetation is a mixture of species of various ages. Facilities such as trails, trailheads, or interpretive signs can be seen but are constructed in a manner that enhances the visual quality of the area.

Objectives

To protect, enhance, or restore the unique character of the “Deep East Texas Big Thicket”.

Goals

- * Provide non-motorized access into and through the Scenic Area.
- * Promote and interpret the qualities of the Big Creek Scenic Area.
- * Promote and interpret the qualities of the Winters Bayou Scenic Area.
- * Recreational use of the area is primarily intended for interpretation, educational, and inspirational activities.

Standards and Guides

MA-8c-31 Limit suppression strategies, practices, and activities to those which have minimal impacts to scenic values. Extinguish wildfires endangering Scenic Areas.

MA-8c-32 Use no chemical fire retardants during fire suppression.

MA-8c-33 If fire is used to perpetuate a desirable vegetative condition, it should mimic a natural fire, but with prudent measures to avoid catastrophe.

MA-8c-34 Allow fuels to accumulate at natural rates unless they threaten the objectives of Scenic Areas.

Leave fire-caused debris for natural decay.

MA-8c-35 Develop fire management plans and obtain Forest Supervisor's approval before prescribed ignitions occur.

Use prescribed fire to manage or maintain the scenic and botanical character through appropriate successional stages for which the area has been designated.

Management Area 8d Natural Heritage Areas

Coldspring Slender Wake Robin is a 9 acre Natural Heritage Area found in the Landtype Association "Big Thicket" located on the Sam Houston NF.

Desired Conditions

Emphasize relict plant populations and plant communities, especially the mesic hardwood types.

Objectives

Enhance, and promote sustainable populations of unique plants or plant communities.

Goals

In these areas, the natural disturbance effects of fire, weather, and erosive action should be allowed to work unimpeded. Allow frequent fire return intervals to enhance the species composition of fire maintained communities. Fires should be allowed to burn throughout the area, and not be limited to specific sites, to allow natural plant community variability and ecotones to reestablish.

Standards and Guides

MA-8d-31 Limit suppression strategies, practices, and activities to those which have minimal impacts to botanical values. Extinguish wildfires endangering the area.

MA-8d-32 Use prescribed fire to manage or maintain the botanical character and successional stages for which the area has been designated unless restricted in certain plant communities as defined in specific botanical areas.

MA-8d-33 Normally allow fuels to accumulate at natural rates unless they threaten the objectives of the area.

Leave fire-caused debris for natural decay.

Management Area 8f Cultural Heritage Areas

Description

Archeological and Historic Areas - A unit of land possessing features, sites, or a concentration of sites, buildings, structures, or objects united historically or prehistorically by plan or physical development, and which have been determined to be significant to our understanding of the prehistoric and historic occupation and utilization of the lands in which they are located

Desired Condition

The historical integrity of the sites are maintained so that the scientific and educational values are retained.

Objective

Not Stated

Goals

Not Stated

Standards and Guides

MA-8f-31 Manage fire and fuels through suppression practices, management of ignited prescribed fire, and vegetation manipulation to protect the values for which the area is designated or to maintain or restore natural conditions.

MA-8f-32 Accomplish fire suppression and fuels management without the use of heavy equipment or fire plows in those areas where their use would endanger the historical or contextual integrity of site feature or cultural deposits.

Management Area 9a Developed Recreation Sites

On the Sam Houston NF the developed Recreation Sites are: Cagle, Stubblefield, Scott's Ridge, and Double Lake.

Desired Condition

Areas and sites developed with recreational user facilities to enhance camping, picnicking, swimming, boating, and fishing for National Forest visitor’s interpretation and enjoyment of using the Forest and Grassland environments are emphasized.

Objectives

Facilities will be as natural, simple, and unobtrusive as possible, when possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals.

- * Provide a safe, healthful, aesthetic, and non-urban atmosphere for the pursuit of natural resource based recreation.
- * Provide facilities and improvement at an appropriate level of accessibility, consistent with resource protection needs and anticipated user demand.
- * Provide opportunities for meaningful recreation experiences consistent with user demand and expectation.

Standards and Guides

MA-9a-41 The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.

MA-9a-42 Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.

MA-9a-43 Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

MA-9a-43 Fire Management – Cagle Recreation Area, Sam Houston National Forest Only
Utilize prescribed fire to control midstory, promote open upland forest communities, and to reduce fire hazard.

Establish a burning cycle of two to five years with the objective of midstory reduction (not total elimination). All burning prescriptions will be based on site specific conditions, including vegetation, site and weather conditions, and RCW management problems. (Amendment #10, LRMP, September, 2010)

Management Area 9b Minimally Developed Recreation Sites

Desired Conditions

Most areas have a low development scale with few amenities provided. These areas provide a wide spectrum of forest and rangeland settings offering a range of recreation opportunities.

Objective

Facilities will be as natural, simple, and unobtrusive as possible. When possible management will favor a gradual succession to native species. To provide quality recreation facilities.

Goals

- * Provide facilities and improvements, consistent with resource protection needs, anticipated user demand, and compatible with management goals for the surrounding area, to support specialized and dispersed recreation use on the Forest and,
- * Provide a safe, healthful, aesthetic atmosphere for the pursuit of natural, resource based recreation.

Standards and Guides

- MA-9b-41** The appropriate wildfire suppression response is immediate control with fires suppressed at the lowest acreage possible.
- MA-9b-42** Suppression strategies, practices, and activities shall be limited to those which have minimal effects on developed recreation values.
- Ma-9b-43** Prescribed fire may be used for vegetative manipulation to maintain or enhance visual quality and recreation experience.

Management Area 10b Special Use Permit Sites: Example - Utility Corridors

Desired Condition

The desired future condition is a pattern of special uses established to provide facilities, services, or opportunities that are in the general public interest.

Objective

When feasible, special uses are combined in a single corridor rather than developing parallel corridors.

Goals

- * Provide safe, efficient facilities and improvements in an environmentally sensitive manner.
- * Authorize only those occupancies which promote and support the general public welfare, and do not conflict with law and Forest Service policy.
- * Minimize inconsistency with surrounding land uses and minimize the adverse impacts of these uses on other resources.

Standards and Guides

See Forest Wide

3.2.3A FMU Characteristics

3.2.3.1A Safety

- **Flora and Fauna:** Texas is home to numerous plants and animals that could pose a safety risk to firefighters; the list includes poisonous snakes, wasps, biting insects (ticks and chiggers), and poison ivy to name just a few. The southern rough fuel type present in Texas is called the “Big Thicket” for a reason. Numerous thorny vines and briars are present in Texas and can make cross country travel difficult.
- **Snags:** Texas has been hit by several wind events and hurricanes over the last 10 to 15 years which has produced numerous snags that could pose a threat to firefighters and the general public and make fires harder to contain.
- **Environmental Conditions:** Texas is known for long, hot, humid, summer months that can lead to illness caused by overheating. During its short winter season Texas can also experience periods of freezing temperatures and the occasional ice storm or snow storm.

3.2.2.2A Physical

- The FMU is located approximately 60 miles north of Houston, near the towns of New Waverly and Huntsville. The FMU boundary coincides with the Sam Houston NF proclamation boundary.
- Topography : The Topography is flat to gently rolling. The average slopes ranges from 0 to 5% though in some cases slopes can be as steep as 15 to 25%.
- Elevations ranges from 100 to 400 feet above sea level.
- Part of the Sam Houston FMU lies in Montgomery Co. which is a non-attainment area for Ozone.

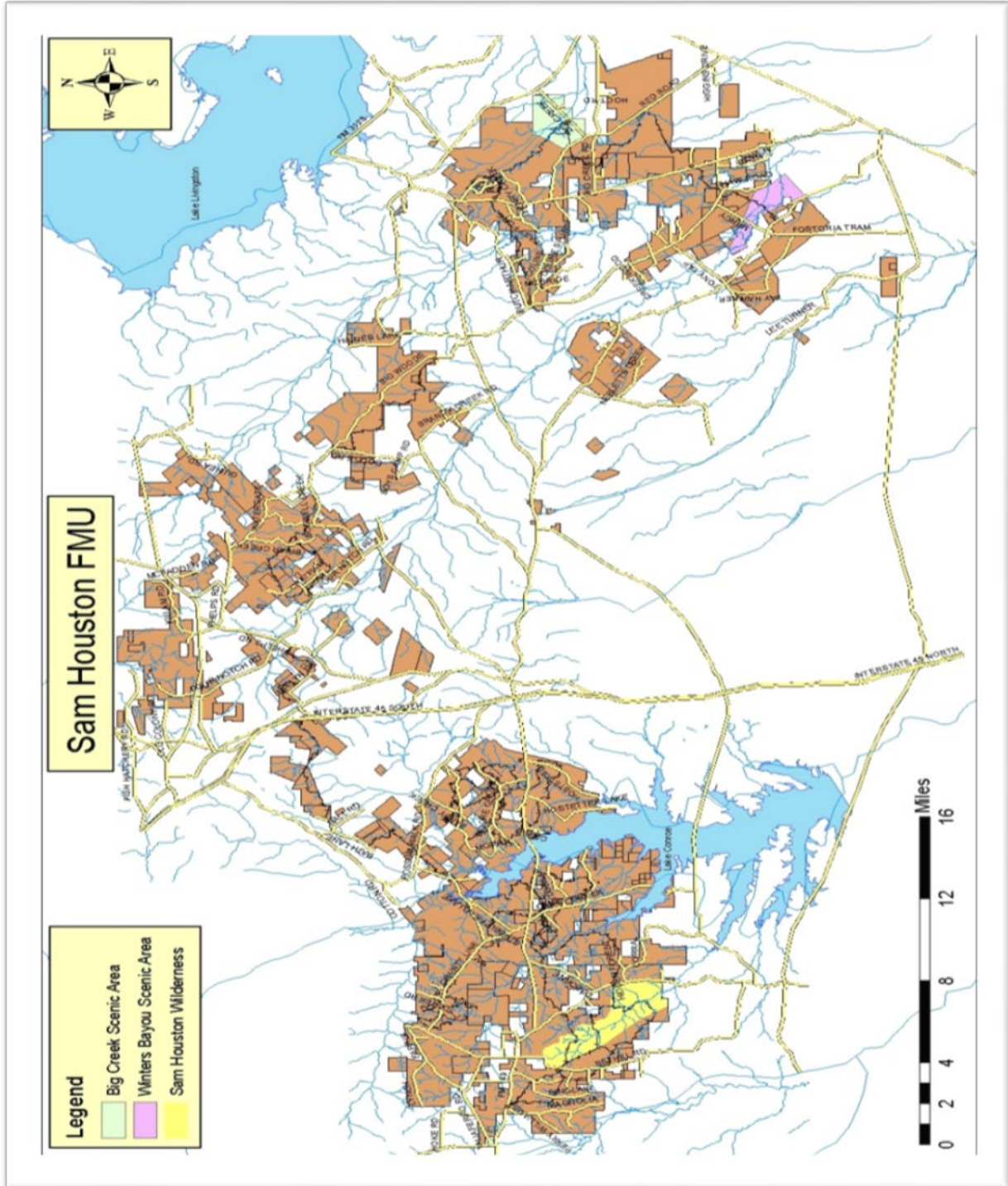


Figure 1: Map of the Sam Houston FMU

3.2.3.3A Biological

Ecological Systems

Table 1 list the Landtype phases or ecological classification system classifications found on the Sam Houston FMU. An ecological classification system classifies land into ecologically equivalent units on the basis of an integration of multiple components of the forest ecosystem including soils, physiography, and vegetation. A land classification based on these components reflects the influence of environmental characteristics of a site, and it gives information about its inherent ecological potential and types of living communities it will support.

Desired Ecological Systems for the Sam Houston FMU

Table 1: Approximate Acres for Landtype Phases

Landtype Phases	Approximate Acres
Dalea Herbaceous Dry Clayey Prairies	2163
Laurel Oak-Loblolly Pine/Callicarpa Loamy Mesic Lower Slopes and Terraces	194
Loblolly Pine-White Oak/Callicarpa-Chasmanthium Sandy/Loamy Dry-Mesic Slopes and Uplands	103089
Overcup Oak/Justicia Clayey/Loamy Seasonally to near Regularly Flooded Low River Floodplains	2073
Shortleaf Pine-Blackjack Oak/Schizachyrium Arenic Dry Uplands	30024
Shortleaf Pine-Post Oak/Callicarpa-Chasmanthium Loamy Dry-Mesic Uplands	300
Small Stream and Riparian	7028
Temporarily Flooded Bottomland	9784
Willow Oak-Loblolly Pine/Justicia-Bignonia Loamy Seasonally Wet Flatwoods	5701

3.2.2.4. A Resources (Wildland Urban Interface, Special Areas, and Recreation Resources)

- **Wildland Urban Interface**

The Sam Houston FMU has extensive urban interface. It is broken up into numerous blocks that are surrounded by houses and associated private development.

- **Special Designations**

Table 2: Special Area

Special Areas within FMU	Acres
Big Creek Scenic Area	1,920
Winters Bayou Scenic Area	1,581
Little Lake Creek Wilderness	3,962

- **Recreation**
 Trail System
 Camping
 Boating Sites

Table 3: List of Recreation areas on the Sam Houston

Name	Type	Name	Type
234 TRAILHEAD	TRAILHEAD	SCOTT'S RIDGE	BOATING SITE
KELLY'S POND	CAMPGROUND	STUBBLEFIELD LAKE	CAMPGROUND
208 TRAILHEAD	TRAILHEAD	BIG CREEK SCENIC AREA TRAILHEAD	TRAILHEAD
233 TRAILHEAD	TRAILHEAD	NORTHWEST TRAILHEAD	TRAILHEAD
CAGLE	CAMPGROUND	SCOTT'S RIDGE SWIM SITE	SWIMMING SITE
DOUBLE LAKE	CAMPGROUND		

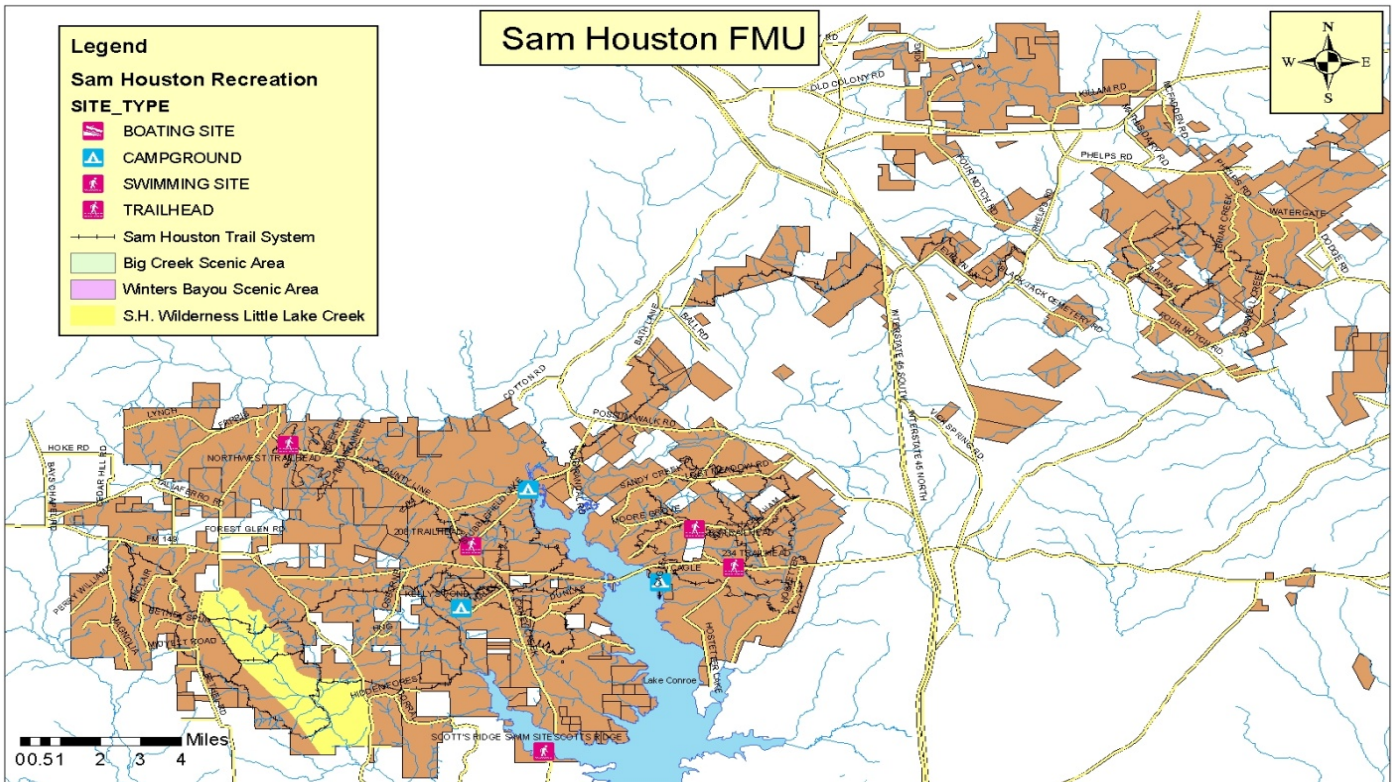


Figure 2: West Half of Sam Houston showing Recreation Sites and Wilderness

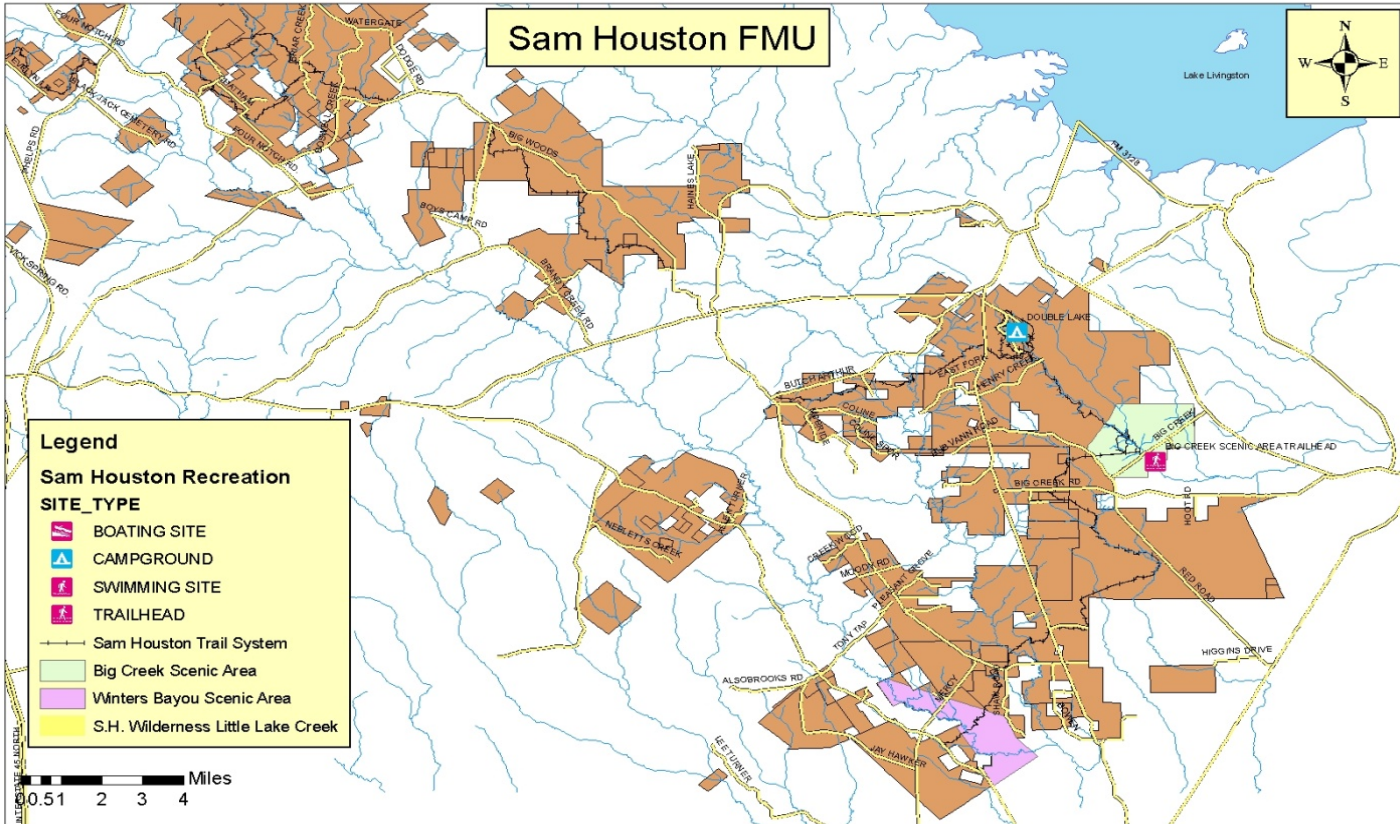


Figure 3: East Half of Sam Houston showing Recreation Sites and Scenic Area

3.2.4.A FMU Fire Environment

The Sam Houston has an aggressive prescribe burn program with much of the area on a 2-5 year burn rotation. The district personnel burn 20,000 to 40,000 acres a year. Extensive areas of fire dependent upland pines habitat can be found, noticeably in conjunction with RCW management areas. Of special concern to fire program management for the FMU is the greater metropolitan area of Houston and the non-attainment areas in Montgomery County and the surrounding Counties. In areas that have not been treated with fire for several years, a build up of fuels has developed that includes volatile plant components and ladder fuels that can lead to more extreme fire behavior under certain conditions.

3.2.4.1A Fire Behavior

The following Fuel Models are found on the Sam Houston NF.

Table 5: Fuel Models Present on the Sam Houston FMU (Source; Landfire)

Fuel Model With	Fire Behavior Notes
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approximate acres	
GR3 310 acres	Primary carrier is grass, very little shrubs present. Average depth 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GR5 117 acres	Dense short grass, very little shrubs present. Average depth 1 to 2 feet. Spread rate can be high (twice as much as GR3) as can flame lengths. Moisture of extinction is 30 to 40 percent. Typically has an open park like pine or hardwood overstory.
GS3 1282 acres	A mixture of grass and shrubs. Moderate fuel loading, average depth less than 2 feet. Spread rate can be high especially with wind pushing it, moderate flame lengths. Can have higher flame lengths as compared to GR3. Moisture of extinction is 30 to 40 percent. Found in areas that have been treated repeatedly with fire. Typically has a pine or hardwood overstory.
SH3 22616 acres	Pine overstory with a shrub understory, moderated fuel load, average depth 2 to 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent.
SH4 99913 acres	Pine overstory with a shrub understory, low fuel load, average depth 3 feet. Typical of a 3 to 4 year old rough. Spread rate low flame length low. Moisture of extinction is 30 to 40 percent. When live herbaceous is fully cured can have a very high rate of spread much higher than SH3 and moderate flame length.
TL2 23420 acres	Pine overstory with a compact leaf litter, low fuel load, average depth 1 to 2 inches. Typical of a one year old rough. Spread rate low flame length low. Moisture of extinction is 25 percent.
TL6 105530 acres	Pine overstory with a moderate fuel load, average depth 2 to 4 inches. Spread rate moderate. Moisture of extinction is 25 percent.
TU3 2727 acres	Pine or Oak Savanna with a moderate forest litter load and grass and shrub components. Spread rate is high, flame length is moderate. Moisture of extinction is 30 percent.

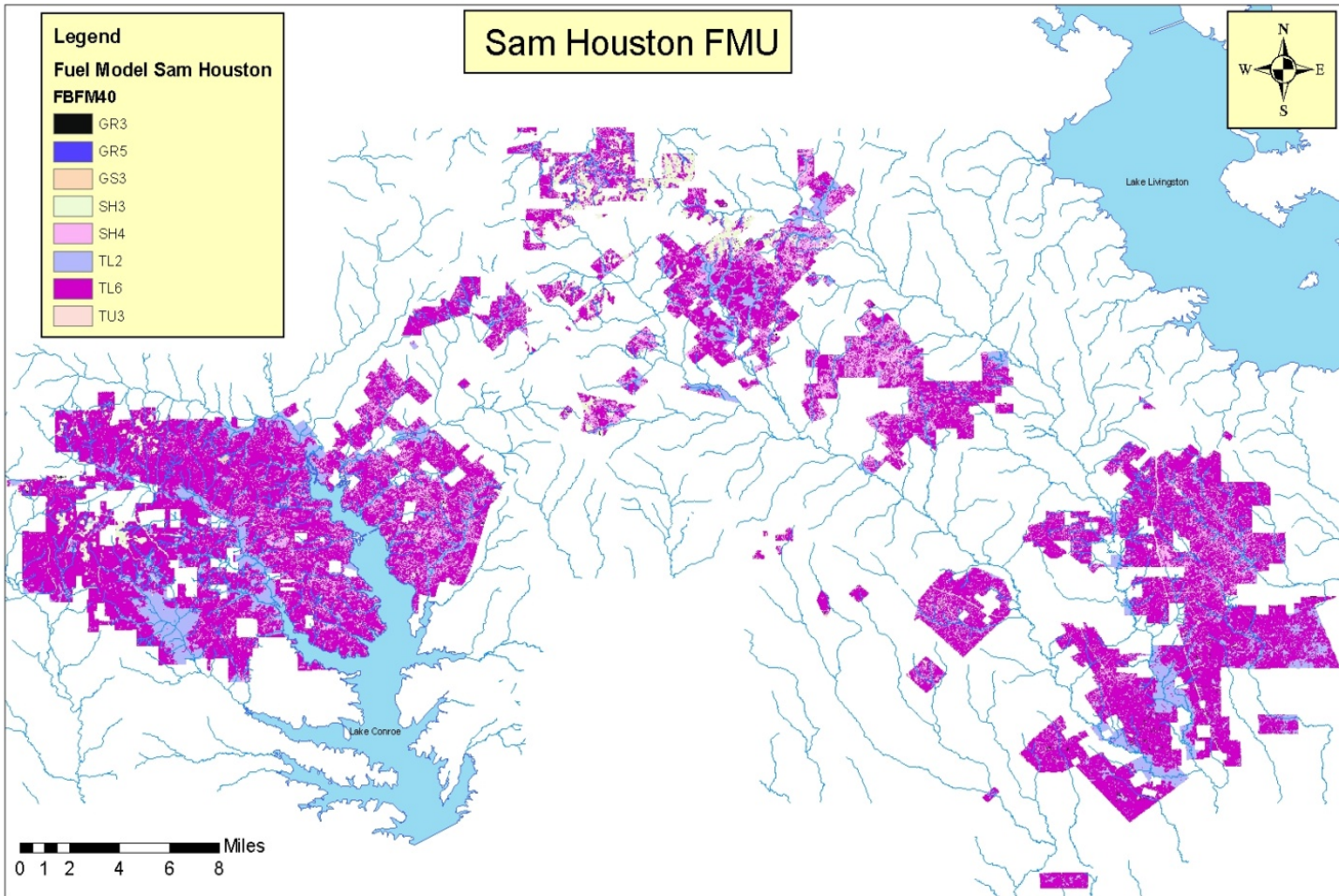
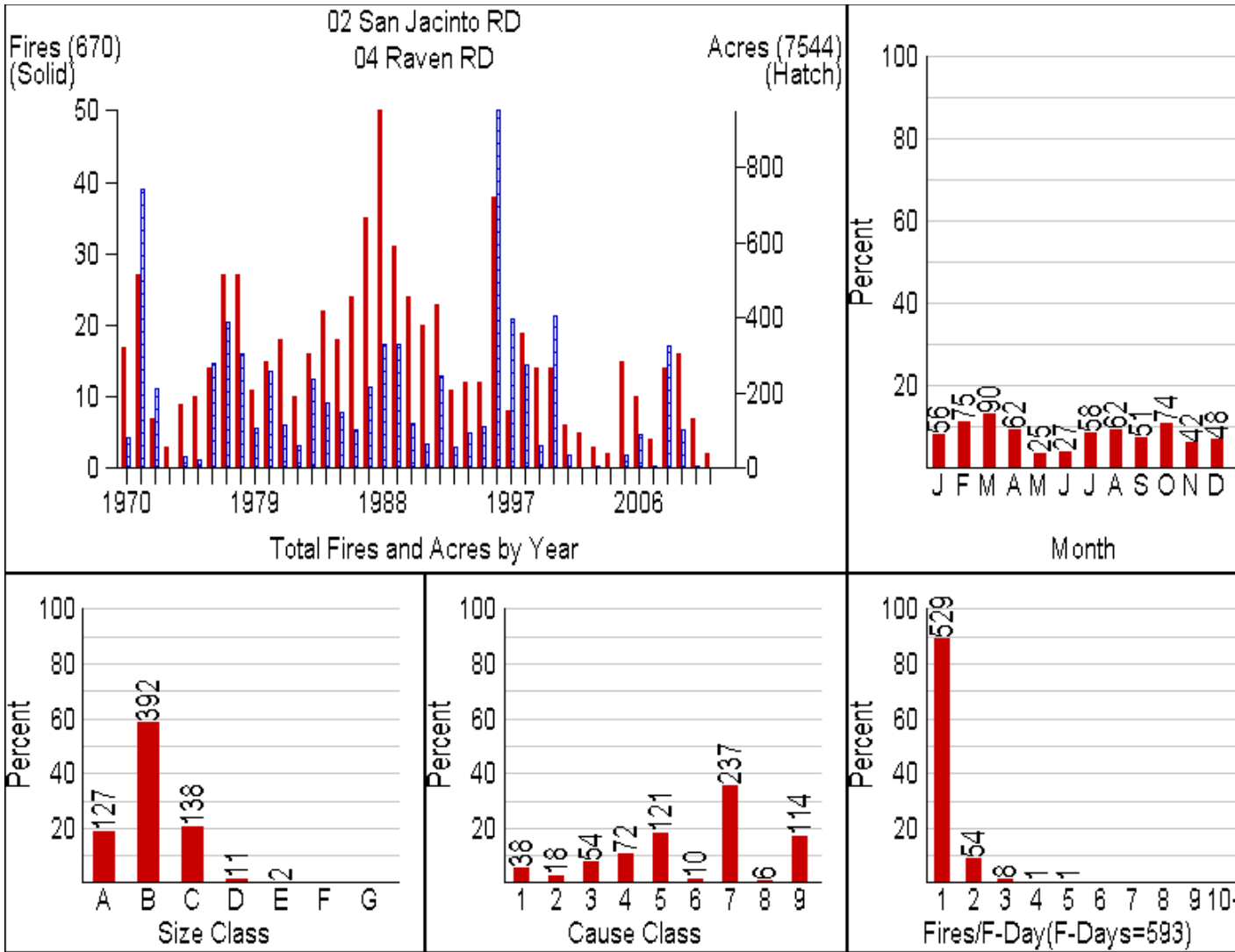


Figure 4: Map showing Fuel Model Distribution on the Sam Houston FMU

Historical Wildfire Fire Occurrence

The Sam Houston FMU (formally the San Jacinto and Raven Ranger District) had 670 fires between 1970 and the start of 2011. This is an average of 16 to 17 wildfires a year. Most of the fires occur in the Spring but fires can occur year round. The largest fire was 507 acres which occurred on 6/24/71. Most of the fires were arson caused with some limited lightning caused fire. Approximately one fire per year started from lightening.

Table 6. Sam Houston Fire Occurrence



Size Class A = 0.0 to 0.25 ac; B = 0.26 to 9.9 ac; C = 10.0 to 99.9 ac; D = 100.0 to 299.9 ac; E = 300.0 to 999.9+ ac.

Cause Class: 1 = Lighting, 2 = Equipment, 3 = Smoking, 4 = Campfire, 5 = Debris Burning, 6 = Railroad, 7 = Arson, 8 = Children, 9 = Miscellaneous

3.2.4.2 A Weather

The winter is generally the driest time of the year with the greatest wind event potential and low relative humidity's behind passing storms, though widespread precipitation can also occur. During the spring the potential for windy and dry events diminishes steadily from south to north as the jet stream retreats. Shifts in the jet stream allows warm, moist air masses arising from the Gulf of Mexico to become increasingly dominant. The summer is generally warm to hot and humid with light winds under the Bermuda High influence. Critical drying can occur if the high becomes centered over land and becomes modified. A period of peak tropical cyclone activity begins late in the summer, bringing the potential for windy/dry conditions in advance of any storms followed by copious moisture. The fall brings a continuance of the tropical cyclone

season early, then dry air intrusion and the potential wind events return with the southward shift in the jet stream. Moist conditions often persist along the Gulf Coast through fall.

Other climate factors that influence Texas weather include the Mexican High Plain, or Altiplanicie Mexicana. This arid, high-altitude plateau region extends northward from Mexico City nearly to the United States border. Rarely does this air reach ground level in Texas except in the Trans-Pecos region, but it influences the weather throughout the State. When surface winds in Texas are from the south or southeast, winds 10,000 feet above ground are normally from the southwest. Thus, low-level air from the Gulf of Mexico is overlaid with warmer, drier air from the Mexican High Plain. Close to the Mexican border, this warm air 'caps' the humid Gulf air, preventing thunderstorm activity and trapping the humid air close to the ground. As the air masses precede north, particularly during the spring and fall, they progressively move beneath cooler air aloft. While the humid low-level air becomes more unstable, it still cannot convect because of the capping inversion. Eventually, if a frontal system or other disturbance causes larger-scale ascent, the Mexican High Plain air can cool enough to eliminate the cap, suddenly allowing vigorous thunderstorm activity to take place. The combination of the Gulf of Mexico and the Altiplanicie Mexicana makes Texas and the southern Great Plains the worldwide hot spot for severe convection and tornadoes.

The Rocky Mountains also has an impact on the climate in Texas. Arizona, New Mexico, and west Texas form one of two relative gaps in the Rocky Mountain Cordillera; the other is along the United States-Canadian border. Westerly winds often blow through this gap, but the Rockies form a broad barrier to westerlies for the rest of the State. In the eastern half of Texas, the least likely wind direction is from the west. The Rockies also block air from moving across them from the east. In particular, cold air masses that reach the United States from the north cannot easily spread westward and instead are funneled southward parallel to the mountains. Such cold air reaches farther south into Texas and beyond than anywhere else on the continent.

Despite the threat of the rare snow or ice storm, winters in most parts of Texas are mild and pleasant. Sunshine averages at least 45 percent of maximum possible along the coast. In Houston, the growing season is 300 days long; in Dallas, 235. The latest freeze typically occur after April 1st, in less than half the State.

May is typically the wettest month of the year and also has a high occurrence of tornados. Summer produces the most equitable distribution of rainfall. Thunderstorms are common in the State, but the departure of the jet stream to the north means that severe thunderstorms are a rarity. Despite the continued rainfall, the high temperatures mean that normal evaporation exceeds precipitation in all areas of the State. Below-normal precipitation can cause significant environmental stress, and the State is most susceptible to drought during summertime as a result. The reduced evaporation from the soil and plants under drought conditions also causes temperatures to be just a little bit warmer, making the situation even worse.

The following was taken from the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center;

http://hurricane.ncdc.noaa.gov/climatenormals/clim60/states/Clim_TX_01.pdf, accessed April 27, 2011.

Table 7: Average Weather readings for East Texas

Lufkin	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Precipitation	4.45	3.17	3.53	3.13	5.29	4.18	2.6	3.08	4.08	4.13	4.54	4.44	46.62
Mean Temp	48.6	52.9	59.8	66.2	73.7	79.7	82.6	82.2	77.3	67.7	57.7	50.3	66.6