

**ENVIRONMENTAL ASSESSMENT**

**for**

**Red-cockaded Woodpecker Prescribed Burning Project**

**Davy Crockett National Forest**

**Houston and Trinity Counties, Texas**

**January, 2013**

**Responsible Agency:**

USDA Forest Service

**Responsible Official:**

Gerald Lawrence

District Ranger

Davy Crockett National Forest

**FOR FURTHER INFORMATION CONTACT:**

**Gerald Lawrence, District Ranger**

**or**

**Bobi Stiles, District Fire Management Officer**

**Davy Crockett National Forest**

**18551 State Highway 7 East**

**Kennard, Texas 75847**

**936-655-2299**

**ENVIRONMENTAL ASSESSMENT**  
**Davy Crockett National Forest Red-cockaded Prescribed Burning**  
**Davy Crockett National Forest**

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## Chapter 1

### PROPOSAL AND PURPOSE

#### 1.1 Introduction

The Davy Crockett National Forest (DCNF) is proposing the use of dormant and growing season burning in Houston and Trinity Counties, Texas. Originally the **Davy Crockett N.F. Prescribed Burning Project (DCNFPBP)** consisted of Compartments 1,2,3,5,6,7,11,12,13,14,15,16,17,18,19, 20, 22,26,27,28,29,30,32,33,34,35,36,37,39,40,41,42,43,46,47,48,49,50,54,55,56,57,58,59,60, 62,64,65,66,67,68,69,70,71,72,73,76,78,79,94,95,100,101,104,105,106,110,112,113,114,115, 116,117,118,119,120, and 121. This environmental assessment will consider only those compartments in MA2 – RCW Emphasis and any included MA4 – Streamside Management: Compartments 5,6,7,11,12,13,14,15,16,17,22,27,28,29,30,32,33,34,35,36,37,39,40,41,42,43,49, 50, 54,55,56,57,58,59,64,65, 66,67,68,69,112,113,114,115,116,117, and 118. For the purpose of this environmental analysis (EA), these compartments will be referred to as the “project area” for the DCNF RCW Prescribed Burning Project, see Vicinity Map, Appendix A. The remaining compartments will be analyzed in a separate document.

The project area contains approximately 69,000 acres in two management areas: Management Area 2 (MA2), Red-cockaded Woodpecker Emphasis and Management Area 4 (MA4), Streamside Management Zones as designated in the *1996 Revised Land and Resource Management Plan for the National Forests and Grasslands in Texas* (the *Plan*). The theme of MA-2 is habitat for the RCW-described as a landscape managed for large, older trees with the longleaf-little bluestem, shortleaf pine-oak, and loblolly pine-oak dominated communities, while offering a wide range of compatible multiple uses but primarily for the recovery of the red-cockaded woodpecker. Streamside Management Zones (MA-4) will be managed to maintain and restore these areas while providing for multiple uses. The proposed burning is consistent with the management direction in the *Plan*.

A portion of the project area lies within the boundaries of the Alabama Creek Wildlife Management Area, which has been managed jointly with the Texas Parks and Wildlife Department since 1981, to provide adequate wildlife resources for the public to enjoy.

## 1.2 Purpose and Need for Action

Differences between current and desired conditions have been identified within the project area. In order to move the project area toward the desired future conditions, specific resource management actions were identified and alternatives were developed. This EA is tiered to the management direction stated in the *Plan* which describes the desired future condition (DFC) and provides standards and guidelines.

This Proposed Action meets the standards and guidelines in the *Plan* to meet the objectives developed for the different management areas. The Proposed Action also complies with the U.S. Fish and Wildlife 2003 Second Revision Red-cockaded Woodpecker Recovery Plan (RCW Recovery Plan).

In addition, the National Fire Plan (NFP) was developed in August, 2000, following a landmark wildland fire season to lay the foundation for a long-term program to reduce fire risk and restore healthy fire-adapted ecosystems. In response to the increased risks posed by heavy fuel loads, which is the result of decades of fire suppression, sustained drought, and increasing insect, disease, and invasive plant infestations, hazardous fuels reduction programs were developed. These treatments are designed to reduce the risks of fire in the Nation's forests and rangelands by removing or modifying wildland fuels to reduce the potential for severe fire behavior, lessen post-fire damage and limit the spread or proliferation of invasive species and diseases. Treatments proposed included prescribed fire.

Further, Fire Regime Class Condition (FRCC) was developed for, and is utilized as, an interagency, standardized tool for determining the degree of departure from reference condition vegetation, fuels and disturbance regimes. A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning. Natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation (Fire Regime Condition Class).

Fire Regime I best reflects the conditions on the DCNF. Fire Regime I is defined as: 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced) or short return interval, non-lethal fire.

Condition Class is the classification based on the current amount of departure that exists from the natural regime. This departure can result in changes to vegetation characteristics (species composition, structural stages, stand age, canopy closure and/or mosaic pattern), fuel composition, fire frequency, severity, and pattern and other associated disturbances (mortality, grazing, drought). Three classifications have been developed based on departure from the historical regime: FRCC1 (low); FRCC2 (moderate); and FRCC3 (high). FRCC1 is considered to be

within the historical range of variability while FRCC2 and FRCC3 are considered to be outside the natural range of variability (Fire Regime Condition Class).

The goal of prescribed burning is to move the DCNF towards and/or maintain FRCC1.

### **1.3 Decision to be Made**

Based on the analysis and description of the Need for the Proposed Action documented in this EA, the responsible official will make the following decisions:

1. Determine whether the Proposed Action should be implemented at this time, or if an alternative to the Proposed Action should be implemented at this time; and
2. Determine the management requirements and monitoring activities necessary to protect the ecosystem and to achieve other resource goals, objectives, and desired future conditions.

Should a decision be made to select all or part of an action alternative, the selected alternative would be implemented until conditions on the ground change substantially. The responsible official would make the determination when the decision is no longer valid.

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations that implement NEPA mandate that agencies consider environmental issues. The decision to be made would be based on the environmental and non-environmental issues evaluated in this document.

### **1.4 Proposed Action**

Prescribe burning is, and has been used, to obtain the desired future condition for southern pines of the west coastal plains which are described as open stands of pine, rich in species diversity with productive herbaceous plant communities. Broadcast burning is the proposed method to be used with pile burning where needed and approved by Heritage Resources. Broadcast burning would utilize existing natural and man-made barriers such as dozer line, hand line, streams, wet line and roads to serve as control lines. Dozer lines would generally be 8-10 feet wide and follow existing lines along property boundaries or around special features such as regeneration areas. Water bars to slow water flow will be installed as described in the *Plan*. Sections of control line that do not vegetate promptly would be seeded and fertilized. Native seed would be used where feasible. Handline (raked or blown with leaf blower), wet line, streams or roads would be used where dozer use is not appropriate or necessary.

The compartments in the project area have been burned or prepared for burning within the last five years. Timing of future burns will be determined by staffing, funding, weather, fuel conditions and priorities set by an interdisciplinary team of resource managers. Based on past

burning accomplishments, it is estimated that approximately 30,000 to 35,000 acres would be burned annually in all management areas. Fewer acres would be burned in years when resources are scarce and more acres burned when resources are abundant and conditions are favorable.

The seasonality of the implementation of the burns (dormant or growing season) also depends on several factors, but generally dormant season (September – February) burns are used to initially reduce fuel loading. Dormant season burns serve to reduce the amount of dead grasses, leaves, needles, etc. and lessen the risk of catastrophic wildfires. Growing season burns (March – August) are used to control midstory, both pine and hardwood species, and move towards the desired FRCCI. Dormant and growing season burns help reduce fuel loading, and create temporary site openings in the understory which help to promote herbaceous species (grasses and forbs) occupation. The increased vegetation diversity enhances wildlife habitat and promotes a healthy forest.

### **1.5 Management Requirements**

Management requirements are included as part of the Proposed Action and other action alternatives. Included in the Proposed Action are applicable standard and guidelines in the *Plan* and management requirements of the Final Environmental Impact Statement for Vegetation Management in the Coastal Plain/Piedmont (VM-FEIS). These requirements are incorporated here by reference:

- The *Plan*
- VM-FEIS: Volume I
- U.S. Fish and Wildlife 2003 Second Revision Red-cockaded Woodpecker Recovery Plan (RCW Recovery Plan) 2003: pages 162-205 (Section 8 Guidelines).
- Interagency Prescribed fire Implementation Guide

Design criteria are defined as actions taken to avoid, minimize, reduce, eliminate or compensate for adverse effects of implementing the Proposed Action or alternative actions. The *Plan* management requirements, standards and guidelines are incorporated in the design of the proposal and alternatives.

## **FOREST-WIDE STANDARDS**

### **Air Quality**

**FW-001** Management activities will maintain air quality that meets applicable Federal and State Standards and Regulations.

**FW-004** Apply applicable Forest Service or State Smoke Management Guidelines during prescribed burns.

### **Biological Diversity**

**FW-23** 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-25** Manage, identify, protect habitat for proposed endangered, threatened, sensitive species and exemplary plant communities.

### **Cultural Resources**

**FW-041** Inventories of cultural resources and consultation with the State Historic Preservation Officer (SHPO) will be completed for all projects which involve a decision to implement ground disturbing activities.

**FW-043** If archaeological or historic resources are encountered during soil disturbing activities, work stops until an archeologist evaluates the sites' significance and completes any necessary consultation with SHPO.

### **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.

**FW-062** To minimize erosion on firelines, develop water bars as specified in forest-wide soil & water standards and seed bare earth.

**FW-063** For vegetation management actions using fire as a tool, the following standards from the VM ROD will be followed.

**FW-063-1** Site-specific planning for all prescribed burns is done by trained resource specialist 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 area, protection of sensitive features, as well as fireline placement, specific firing patterns, ignition methods, and mop-up and patrol procedures. A post-burn evaluation compares treatment results with plan objectives.

**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 0.3 to 0.5 inch in diameter. After height growth begins, burns can be used once seedlings are 3 to 5 feet tall.

**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.

**FS-063-4** On severely eroded forest soils, any area with an average litter-duff depth of less than ½ inch is not burned.

**FW-063-5** Where needed to prevent erosion, water diversions are installed on firelines during their construction, and the firelines are re-vegetated promptly after the burn.

**FW-063-6** Firelines 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 length 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 1.5 times the percent slope.

**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 or when predictions indicate that smoke drift into highways, airports, populated areas, or other sensitive areas may be hazardous.

**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.

**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 brownspot 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).

**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.

**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.

**FW-063-14** Prescribed fires are conducted under the direct supervision of a burning boss with fire behavior expertise and consistent with the project's complexity. All workers must meet health, age, physical and training requirements in FMS 5140, and use protective clothing and equipment.

## **Planning**

**FW-131** Management activities on the NFGT will be directed through Forest Plan standards and guidelines. Site-specific project level decision implementing this direction must have appropriate environmental analysis.

## **Soil and Water**

**FW-211** Maintain soil erosion within tolerance levels for that soil type and minimize increases in stream turbidity, (see Plan Appendix F) and meet non-point source pollution goals and aquatic habitat objectives.

**FW-212** Do not operate equipment if damage occurs during wet ground conditions.

**FW-215** Construct water bars at an angle of 30 to 40 degrees downslope with the centerline of the unimproved roads, trails and firelines; the minimum water bar height will be 1.5 feet (compacted) and the minimum channel depth will be one foot.

**FW-216** Employ the following maximum water bar spacing on unimproved roads, fire lines and trails:

Slope Percent	Maximum Spacing
0.5 – 2	300 feet
2-4	190 feet
4-6	150 feet
6-8	130 feet
8-10	120 feet
10-12	110 feet
12-15	80 feet
15-20	60 feet
20+	40 feet

**Visual Quality**

FW-185 provides guidance for scenic resources based on Visual Quality Objectives.

**Coordination Guidelines**

Forest Type	Partial Retention	Modification	Maximum Modification
RCW/Longleaf	DW	DV	D

- D. Favor Flowering and other visually attractive vegetation to enhance variety when leaving vegetation.
- V. Attempt to keep overstory crown scorch at or below 20 percent, with bark char generally under 8 ft. in height.
- W. Wind should be blowing away from public roads.

**MA-2 STANDARDS**

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

**MA-4 STANDARDS**

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

**1.6 ISSUES**

The scoping process was the first step to identify issues to the proposed actions. Scoping is defined by NEPA (40 CRD 1501.7) as “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the Proposed Action.

The issues were used to develop design criteria and potential alternative management actions.

An interdisciplinary team (IDT) met during September, 2012 to discuss issues and concerns for the prescribed burn program. Public scoping was initiated September 21, 2012. A letter of invitation to comment on the Proposed Action was mailed to persons and organizations that had expressed interest in local Forest Service projects.

The IDT identified the following management concerns:

- Concern 1. The loss of RCW habitat due to increased midstory.
- Concern 2. Loss of native grasses due to encroachment of shrubs.
- Concern 3. Manage the forest to reduce the influx of non-native invasive plant species (NNIPS) Executive Order #13112.
- Concern 4. The need for dormant and growing season burns across the project area.

Additional issues raised during scoping were: 1) appropriateness of aerial ignition; 2) fire intensity in streamside zones; 3) ecological requirements for burning; 4) protecting locally sensitive plants; 5) postponing implementation of burning in C-70,71,72,73 and 94; 6) limiting the size of the burn unit to 1000 acres; 7) monitoring the effects of prescribed burning on the Neches River Rose Mallow; 8) identifying the best management practices for protecting red-cockaded woodpecker nest cavities.

Additional issues were raised that are beyond the scope of this project: 1) identification of a special management area along Piney Creek – this will be addressed in the Forest Plan when developed; 2) use of hand tools to control midstory in RCW habitat – this will be addressed in individual compartment projects; 3) not including additional RCW habitat areas (C-22,23,31,38) – C-22 has been included in this analysis but C-23,31 and 38 will be considered at a later date; and 4) firelanes creating entry points for off-road vehicle use – this is a law enforcement issue and District law enforcement officers have been notified.

## **1.7 SUMMARY OF IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Irreversible commitments are non-renewable resources that are permanently lost or renewable resources that can only be renewed after a long period of time. Non-renewable resources include heritage (archaeological), soil (productivity), and minerals, such as oil and gas, coal, or petroleum products.

An irretrievable commitment of resources is the production of renewable resources lost because of allocation decisions that forego the production or use of renewable resources. Allocation decisions that forego the production or use of most renewable resources for relatively long periods of time include those that establish wilderness and scenic areas, research natural areas, recreation sites, and the construction of new roads.

There would be no irreversible or irretrievable commitment of resources for any alternative described in this environmental assessment.

## Chapter 2

### THE ALTERNATIVES CONSIDERED

#### 2.1 INTRODUCTION

Alternatives were developed by the IDT to meet the purpose and need of the Proposed Action discussed in Section 1.2 of this document. These alternatives were developed in response to the most relevant issues presented in Section 1.6. This chapter includes a detailed description of the Proposed Action and Alternative 1 (No Action).

#### 2.2 DEVELOPMENT AND DESCRIPTION OF ALTERNATIVES

##### 2.2.1 Proposed Action

Prescribe burning is the proposed action to respond to the purpose and need for meeting desired future conditions within the project area.

The Proposed Action is designed to help achieve the desired future conditions of improved forest health, fuel reduction, wildlife habitat improvement, restoration of native plant communities, including longleaf pine communities on National Forest lands within the Davy Crockett National Forest. The proposed action treatments are described in detail in the following paragraphs.

Approximately 69,000 acres would be prescribed for burning under the decision to implement this alternative. Acres within the project area would be burned on a 1-5 year rotation beginning in fiscal year 2013, and continuing for up to 10 years. Burning would occur year round – dormant season burning (September thru February) and growing season burning (March through August).

As desired fire regime condition class (FRCC 1) is achieved, benefits include: 1) desired landscapes, plant communities and ecosystems will be restored (including RCW habitat); and 2) risk of damage caused by fire to private property interspersed with national forest land and national forest lands will be lessened. During this process, management intensity can be adapted based on observed results of the proposed actions. Burning intervals and implementation techniques would be varied based on species composition and vertical development, and fuel loading. Weather and funding would also affect the burning schedule.

Primary focus for ignitions will be areas mostly composed of longleaf, shortleaf and loblolly pine on drier landscapes. Under average fuel and weather conditions fires will naturally begin to extinguish as they move into wetter drainages with a greater hardwood component.

The proposed action also includes activities connected to prescribe burning which include:

- Clearing control lines
- Utilizing existing barriers such as roads, trails and streams where possible to serve as control lines.
- Seeding and fertilizing control lines if lines are not promptly re-vegetated.
- Installing water bars as outlined in the *Plan*.

The proposed action meets the standards and guidelines in the *Plan* for; general forest area, RCW habitat, wildlife habitat, streamside areas, unique plant communities, visual resources and forest recreation resources. The standards and guidelines follow the goals and objectives of the *Plan* discussed in Chapter IV, on pages 41-51 of the *Plan*.

The *Plan* delineates Management Areas (MA) with specific management interests that respond to the goals and objectives and desired future conditions. Prescribe burning is proposed within the following MAs on the Davy Crockett national Forest.

- Management Area 2, Red-cockaded Woodpecker (RCW) Emphasis (the *Plan* MA 2, page 96)  
Goals: Primarily for the recovery of RCW. Manage for landscapes of upland pine woodlands and savannas with large, older trees within the longleaf pine-little bluestem, shortleaf pine-oak, and loblolly pine-oak dominated communities. Continue to offer a range of compatible multiple uses.  
  
Desired Conditions: For Western Coastal Plains and Mid-Coastal Plains Transition Sub-section occurring in the southern portion of Davy Crockett National Forest, open longleaf pine forests on rolling hilltops and on ridges are desired. Understories would be dominated by perennial prairie grasses such as little bluestem, switchgrass and Indian grass. Mixed forests would be interspersed on the lower slope positions made up of longleaf, shortleaf, loblolly and oaks will transcend into bottomland hardwood along larger streams. Over time and with frequent prescribe burning, open longleaf pine and the older pine woodlands should be the dominant character of the area.

For Northern and Mid-Coastal Plains on the Northern Davy Crockett National Forest there should be open shortleaf pine forests on steep hills with deep sandy or clay soils. Droughty hilltops with deep sand or red clay would be primarily shortleaf pine-little bluestem while moderate terrain and side slopes with less droughty, more loamy soils will be dominated by the shortleaf interspersed with some fire adapted oak and hickory trees within the uplands. Lower slopes will exhibit mixed loblolly and hardwood with woody understory species such as yaupon sumac and greenbrier. Hardwood bottoms will contain most of the hydrologic and plant diversity.

Existing Condition: Areas proposed to be burned in MA 2 have been burned within the last 5 years. Since year 2005, hurricanes, tornadoes, local wind events and drought have caused damage in MA 2. Because of this mortality, fuel loading is increasing. RCW foraging habitat has been affected, underscoring the need to continue improving and increasing the habitat.

- Management Area 4, Streamside Management Zones (the *Plan* MA 4, page 145)  
Goals: Manage to maintain the role and function of aquatic, riparian and wetland ecosystems while allowing opportunities for compatible multiple uses. Emphasize these ecosystems during restoration efforts.

Desired Conditions: Contiguous and diverse habitat for riparian and wetland dependent species. Diverse stands of hardwoods with a wide variety of understory vegetation including riparian dependent species. MA 4 should provide high quality water meeting all federal, state and local standards. Opportunities exist for public enjoyment through dispersed recreation management.

Existing Condition: Much of MA 4 is considered to be bottomland hardwoods or transition zones that contain characteristics of this habitat. These areas have been altered by pine encroachment. Hardwood dominated communities are a valuable ecosystem found along perennial streams and rivers on the National Forest and Grasslands in Texas.

### **2.2.2 Alternative 1 (No Action)**

Under this alternative none of the proposed management activities would be implemented. Fire management actions would be limited to prevention, wildfire suppression and implementation of prescribe burning on acres for which other valid NEPA documentation and project plans exist. Selection of the “No Action” alternative would not preclude the consideration of other proposals in this analysis area in the future.

This alternative is required by NEPA and serves as a benchmark for other alternatives in order to analyze the effects on the environment from implementation of management activities. However, this alternative is inconsistent with and does not achieve the desired future conditions described in Chapter 2 of the Plan or in Section 1.2 of this document.

### **2.3 COMPARISON OF ALTERNATIVES**

A quantitative comparison of the environmental effects of the alternatives is summarized in Chapter 3.

## Chapter 3

### ENVIRONMENTAL CONSEQUENCES

#### 3.1 INTRODUCTION

This section of the EA provides a discussion of the expected effects of the Proposed Action and Alternative 1, the No Action alternative presented in Chapter 2.

The Final Environmental Impact Statement (FEIS) for the Revised Land and Resource Management Plan (1996), the Final Environmental Impact Statement (VM-FEIS) Vegetation Management in the Coastal Plain/Piedmont (1989) and the Wildland fire in Ecosystems (the Rainbow Series) present analyses of general effects expected from prescribed burning. Discussions of the effects in this chapter are tiered to these documents as well as the Ecological Classification System for the National Forest and Adjacent Areas of the West Coast Coastal Plains (1999).

The IDT identified the following concerns:

- Concern 1. The loss of RCW habitat due to increased midstory and woody understory.
- Concern 2. Loss of native grasses due to encroachment of shrubs.
- Concern 3. Manage the forest to reduce the influx of non-native invasive plant species (NNIPS) Executive Order #13112.
- Concern 4. Need for growing and dormant season burning across the project area.

Additional issues raised during scoping were: 1) appropriateness of aerial ignition; 2) fire intensity in streamside zones; 3) ecological requirements for burning; 4) protecting locally sensitive plants; 5) postponing implementation of burning in C-70,71,72,73 and 94; 6) limiting the size of the burn unit to 1000 acres; 7) monitoring the effects of prescribed burning on the Neches River Rose Mallow; 8) identifying the best management practices for protecting red-cockaded woodpecker nest cavities.

Additional issues were raised that are beyond the scope of this project: 1) identification of a special management area along Piney Creek – this will be addressed in the Forest Plan revision when developed; 2) use of hand tools to control midstory in RCW habitat – this will be addressed in individual compartment projects; 3) not including additional RCW habitat areas (C-22,23,31,38) – C-22 has been included in this analysis but C-23,31 and 38 will be considered at a

later date; and 4) firelanes creating entry points for off-road vehicle use – this is a law enforcement issue and District law enforcement officers have been notified.

It is estimated that approximately 30,000 to 35,000 acres will be burned annually in all management areas. The order of entry will be determined by an interdisciplinary team that will evaluate existing conditions, funding and resources available.

Compartments 70, 71 72 and 73 will not be treated until Texas Conservation Alliance (TCA) and NFGT have additional time to evaluate these compartments. The portion of Compartment 94 west of Piney Creek would not be ignited. The SMZ on the east side of Piney Creek would not be ignited but flanking or backing fire would not be excluded.

This Environmental Assessment will only address prescribed burning national forest lands in Management Area 2 – RCW Emphasis and any included Management Area 4 – Streamside Management Zones. Prescribed burning in Management Areas 4, 8, 9 and 10 will be covered under a separate environmental assessment.

Table 1 shows the history of prescribed fire in MA2 on the DCNF for the last five years. Generally, the compartments in the MA2 have been burned on a 2-3 year interval for several cycles.

Table 1. 5-year prescribed fire history

Compartment	FY08 acres Burned	FY09 acres burned	FY10 acres burned	FY11 acres burned	FY12 acres burned
5			1293		
6			1076		
7			1181		
11			500		
12	846		546	207	633
13					1302
14					2261
15	1598				1598
16	1276		1241		39
17	1248		1055		195
22 (Part)	819	323			
27	835		835		
28			750		
29	1726		1395	333	
30		1680			
32	2072		2072		

Compartment	FY08 acres Burned	FY09 acres burned	FY10 acres burned	FY11 acres burned	FY12 acres burned
33	1178			1386	
34	1601			1331	
35		809			810
36					1055
37			1604		
39		2173		2166	
40					
41	1923				
42			970		
43			1763		
49	1515			921	
50	1562			1473	
54		2385			
55		1733			
56		1676			
57			1701	1726	
58			1215	1215	
59			588		
64				1561	
65				563	717
66	1354				1354
67	1398			92	1332
68					1894
69			1079		
112	1474			1282	802
114		1909			
115	1350		1444		1444
116	2201		2201		2201
117		705		358	
118		1262		1204	

The analysis of Proposed, Endangered, Threatened, and Sensitive (PETS) species were considered in the Wildlife Specialist Technical Report. This report is included as a part of this analysis (see Appendix B).

## 3.2 FOREST VEGETATION

### 3.2.1 General Vegetation

**Affected Environment** The DCNF is divided into 4 major landtype associations (LTA), which represent the historical landscapes of the Forest: the Clayey Uplands; the Sandy Uplands; the Sparta Sandhills; and the Alluvial Floodplains and Terraces (Ecological Classification System for the National Forests and Adjacent Areas of the West Gulf Coastal Plain, 1999).

**Clayey Uplands:** The vegetation associated with the Clayey Uplands is longleaf on the eastern boundary and shortleaf-oak-hickory on the western reaches. The plant communities include: Longleaf Pine-Little Bluestem Series; American Beech-White Oak Series; Loblolly Pine-Oak Series; and the Shortleaf Pine-Oak Series. High intensity, frequent fires are most effective in restoring the savanna-like conditions in the Longleaf-Little Bluestem Series. Fires in the Loblolly Pine-Oak Series and Shortleaf Pine-Oak Series were less frequent than in longleaf but frequent enough to maintain open-canopied stands with grassy understories.

**Sandy Uplands:** Longleaf (eastern portion) and shortleaf (western portion) pine dominated these loamy soils. Fire frequency is frequent to very frequent. (1-3 year interval) Because fires occurred frequently, fires are generally low-intensity surface fires.

**Sparta Sandhills:** Shortleaf pine, post oak, black hickory and bluejack oak are the dominant overstory species. Fires are frequent to very frequent (1-3 year interval) resulting in low-intensity surface fires.

**Alluvial Floodplains and Terraces:** This LTA lies adjacent to the Neches River. Oaks, black gum, sweetgum and American beech dominate with a component of loblolly and shortleaf pine. Fire is infrequent (10-20 year interval) in this LTA.

Scoping identified issues concerning mitigation for protecting sensitive plant species. Texas Prairie Dawn (*Hymenoxys texana*) is the only listed plant species known to occur in Trinity County. Louisiana squarehead and Neches River Rose Mallow are designated as Management Indicator Species. These species are monitored annually. All locations of these plants have previously been burned with no known adverse effects.

**Proposed Action.** Under the proposed action, prescribed burns would be conducted during the growing and dormant seasons on a 1-5 year interval. A 2-3 year burn interval is preferred but occasionally annual burning may be required. Conditions that would warrant a one year interval include but not limited to: 1) previous burns did not meet objectives; 2) loss of funding; 3) management activities that will preclude burning on the preferred 2-3 year cycle

(such as a timber sale); and/or 4) increased fuel loading due to wind events, drought or management activities.

Streamside management zones (SMZ's) will not be plowed out to exclude fire but generally the higher fuel moistures associated with these areas will moderate or extinguish the fire behavior. The use flanking fires in the SMZ (particularly Piney Creek SMZ) will further moderate the fire behavior in the streamside zone.

Both aerial ignition and ground ignition may be utilized. Aerial ignition consists of dropping a plastic sphere filled with potassium permanganate which has been injected with ethyl glycol to create an exothermic reaction. The spheres ignite the fuel on the ground creating many single source ignitions. Each ignition has the components of a lightning strike - a head, heel and two flanks. As these single ignitions grow, they encounter the ignitions created by other plastic spheres, allowing the fires to burn together before intense fire behavior can develop. Ground ignition may consist of using drip torches, flare pistols or fusees. In strip head firing, the base line is secured and then parallel strips are fired across the burn unit until the burn is complete. The width of the strips can be adjusted depending on fire behavior.

Aerial ignition is generally used when larger acreages are to be burned or when terrain or vegetation makes it difficult for personnel to traverse the burn unit. Aerial ignition burns can be completed more quickly, allowing more time for smoke dispersal before nighttime inversions set in. Aerial ignitions generally have a lower cost per acre.

The prescribed burns are planned and conducted within compartment boundaries. Compartments are administrative management units that range from approximately 500 acres to 3000 acres. While the compartment boundary defines the burn block, the fire does not burn consistently across the landscape. Micro climates allow the fire to burn in a mosaic pattern, consuming more fuel in some areas, avoiding other areas entirely with varying fire intensities across the unit. This mosaic provides a safe haven for small animals, provides filters for erosion control and promotes diversity of plant species within the burn unit.

Both growing and dormant season burns would be implemented. Both types of burning reduce the fuel loads but generally growing season burns reduces more of the midstory component, as well as the woody understory. Growing season burns would also increase available openings for desired forbs and grasses and thereby increases species diversity and promote seedling establishment in pine stands (site preparation burns). Where fuel moistures allow, growing season burns would kill most hardwoods less than three inches in diameter at breast height (DBH). Larger, more mature hardwoods would survive low intensity fires through

pine/hardwood or hardwood stands. Frequent growing season burns would also kill the roots of young hardwood species thus eliminating sprouts (General Technical Report RMRS-GTR-42-Volume 5).

Prescribed fires would help to create and maintain the open, park-like understory historically found within pine and pine/hardwood forests and favored by the red-cockaded woodpecker. Overall, prescribed burning would improve the health of the forest ecosystems in which burns are conducted.

The only federally listed plant species that is known to occur in Trinity County is the Texas Prairie Dawn (*Hymenoxys texana*). However, it has not been located within the project area.

There are three regionally listed sensitive species, *Crataegus warneri*, *Hibiscus dasycalyx* and *Amorpha paniculata* that occur within the project area. Prescribed burning may impact individuals but it not likely to cause a loss of viability of *Crataegus warneri*. Burning would not affect *Hibiscus dasycalyx* since fire would be extinguished as it approaches the wet substrate where this species grows and burning would have a beneficial impact on *Amorpha paniculata* since burning will reduce the mid-story and allow more sunlight to reach the herbaceous layer of the forest floor. For additional information see Botany Report in Appendix B.

Search of county databases identified no additional locally threatened plant species.

**Alternative 1.** Implementation of the no-action alternative within the pine and pine/hardwood stands would eventually allow the hardwood and shrub components in the understory to increase. The dense closed canopy stands (shaded conditions) would promote the growth of shade tolerant hardwoods and woody shrub species. The reduction of herbaceous ground cover which includes grasses and forbs would affect foraging quality for RCW and reduce the stands' ability to carry fire. Flora and fauna species diversity within these stands would decrease and the health and existence of the ecosystem would be jeopardized.

Within the hardwoods stands, the understory would become dense, species diversity would decrease leading to reduced wildlife value.

In all forest types, the fuel loads would increase to hazardous levels and increase the difficulty of suppressing wildfires, putting fire fighters at risk.

### 3.2.2 Non-Native Invasive Species (NNIS)

#### Affected Environment

Non-native invasive plant species (NNIPS) are generally considered any organism introduced intentionally or accidentally from its native range into an area where the species did not previously occur and is likely to cause economic or environmental harm. Botany Report for Threatened and Endangered Species, Sensitive Species Invasive Species and Management Indicator Species for the Davy Crockett Prescribed Burning Project (BR) identifies the species of concern on the DCNF. The treatments for, and effects of, controlling NNIS are covered under a separate document, The National Forests and Grasslands in Texas Non-Native Invasive Plant Species Project Environmental Assessment (2008) is incorporated into this document by reference. The decision for this EA was signed by the previous Forest Supervisor, Fred Salinas on August 11, 2008.

**Proposed Action.** Fire has not proven to be a viable control method for the 19 non-native invasive plant species (NNIPS) of concern on the Davy Crockett National Forest. The disturbance caused by burning may increase the risk of NNIPS spreading into the project area, however, an early detection and rapid response plan would minimize this risk.

**Alternative 1.** NNIPS occurrences are not limited to prescribed fire activities. An early detection and rapid response plan would reduce the numbers and spread of these invasive plants.

### 3.3 WILDLIFE

This section includes a discussion on the potential effects of the proposed action and the alternatives on wildlife species, including Proposed, Endangered, Threatened, Sensitive species (PETS), as well as Management Indicator Species (MIS) (See Wildlife Specialist Technical Report in Appendix B).

**Proposed Action.** Prescribed burns would be conducted during appropriate weather conditions to maintain low to moderate intensity fire.

**Threatened, Endangered, Proposed and Candidate Species** – the RCW is the only known endangered species in the project area. Guidelines established in the RCW Recovery Plan will be followed. Burning on a 1-5 year cycle would have a beneficial effect on the foraging and cavity habitat for the RCW. Prescribed burning would reduce the amount of pine and hardwood midstory and the woody understory component in the stand. Prescribed burning at

a 1-5 year frequency will keep ground sites open and available for the re-establishment of grasses and forbs. The establishment of the herbaceous ground cover will improve foraging for RCW and the ability of the stand to carry fire.

**R8 Sensitive Species** – Habitat exists in the project area for several R8 Sensitive species. The proposed action would provide more favorable conditions for the following R8 sensitive species: bald eagle, Bachman’s Sparrow, Migrant Loggerhead Shrike, Rafinesque’s Big-eared Bat, and Southeastern Myotis. While these species maybe temporarily displaced by prescribed burning, the benefits of prescribed burning outweigh the negative impacts.

**Terrestrial Management Indicator Species** – these species include the RCW and the eastern wild turkey. RCW were discussed in Threatened, Endangered, Proposed and Candidate Species section.

Eastern turkeys in Texas are associated with open, mature hardwood and mixed forests. Turkeys also require mature trees and a variety of shrubs that provide security cover and roosting sites. Eastern wild turkey generally nest on the ground in hardwood or mixed-forested stand, at base of sizable trees within dense understory, under brush or slash pile, in thickets of greenbriar or downed trees and branches (NRCS 1999). Foraging requirements for turkeys varies depending on the season. Spring and summer forage includes green grasses, weeds, flower buds, seeds and insects while fall and winter forage consists of fruits, mast and green forage such as oats, wheat, and clover. Forest-nesting turkeys commonly nest in close proximity to openings and edges where poults have access to insect foods shortly after hatching.

Houston and Trinity Counties which are within the proposed treatment area report only show 4 reported harvests in 4 years all in Trinity County. The 2012 spring turkey hunting season in Houston County was closed due to the number of reported harvests in recent years.

The use of prescribed fire to manage turkey habitat has been a topic of discussion among biologists. Some biologists feel that prescribed fire use during the spring season has a greater impact on turkey recruitment and therefore negatively affects the population growth. Other biologists feel that of all the necessary habitat requirements for turkey survival the most important is the brood rearing habitat utilized by poults. Poults will forage and survive mostly on insects at an early age and therefore benefit from the diversity commonly found when grass and forbs occur in the understory. Adult turkeys generally can occur in habitat with less of this component because of their ability to utilize alternative food sources such as seeds, buds, and hardwood mast.

The low numbers of harvested turkeys within Houston and Trinity Counties may be directly attributed to the lack of available brood and rearing habitat found in the treatment area. Some habitat areas in the treatment areas that have had a regular frequency (2-3 yrs) of prescribed fire use have maintained an understory with grasses and forbs present. However, a majority of the habitat found within treatment area is dominated with woody species in the understory and a mid-story (pines and hardwood) component. To successfully increase the herbaceous ground cover fire frequency would also have to increase. Recent local studies used to develop a Habitat Suitability Index for turkeys suggests that openings and a herbaceous ground cover were the key factors in determining high quality turkey habitat.

### **Alternative 1.**

**Threatened, Endangered, Proposed and Candidate Species** – lack of fire would not have any direct effect on the RCW but over time the habitat would decline due to the increase in the amount of woody understory species and an undesirable mid-story that would develop. This alternative moves away from the open, park-like desired future condition.

**R8 Sensitive Species** – There would be no direct effects on these species but loss of roosting habitat and lack of suitable foraging habitat would result if prescribed were not implemented.

**Terrestrial Management Indicator Species** – No direct effects are expected but loss of grasses and forbs would impact the foraging opportunities for wild turkey poults. The size of the prescribed burn is determined in part by the geographic features – roads, streams, ownership, etc. and may encompass more than 1000 acres. Prescribed fires do not consume every acre within the burn unit. These underburned areas provide habitat for wild turkey (Wildlife Specialist Technical Report Appendix B). Adjacent burn units may be burned in the same year and may be burned concurrently or temporally separated by as much as three months.

## **3.4 AIR QUALITY**

### **3.4.1 Affected Environment**

The DCNF is in a rural setting. Major land uses are timber production and agriculture which maintains generally good air quality. The rapidly changing weather patterns tend to keep the atmosphere well mixed but stagnation during the summer and fall may cause natural and man-made pollutants to build up. (VM-FEIS, Volume I, page III-15). Prescribed burning is a temporary source of air pollution in the project area.

### 3.4.2 Effects on Air Quality

**Proposed Action.** An average of approximately 30,000 to 35,000 acres annually in all management areas are proposed for prescribed burning. Burning would be used to reduce hazardous fuel build up, improve wildlife habitat and discourage understory species. Prescribed burning conducted under proper management can also prevent severe impacts to air quality by reducing the acres that could burn with higher intensity wildfire.

As the population continues to grow, more people will likely be adversely impacted by smoke on highways near and adjacent to the project area. Burn plans will be prepared to minimize smoke impacts on sensitive areas such as churches, schools and hospitals. Residences near and adjacent to the project area will also be impacted by smoke. Perhaps the most significant effect of smoke from fire is reduced visibility (USDA Forest Service, RMRS-GTR-42, Vol. 5, 2002). The public would be notified prior to the burns to allow enough time to vacate the area or take other precautionary measures. Air quality emissions inventories indicate that prescribed burning is not a major contributor to particulate matter in the atmosphere. Prescribed burning by its very nature is an infrequent particulate matter contributor (VM-FEIS Volume I, Page IV-106). However, air quality effects could include decreased visibility on roads, discomfort for local residents and forest visitors, and the nuisance of the smell of smoke in around residences (VM-FEIS, Vol. I, pages IV- 108 through IV-113). These effects are expected to be minimal with implementation requirements set forth in the Plan.

Burning across the DCNF would be spread over time and space to minimize local cumulative smoke effects. The greatest concern regarding air quality is particulate matter resulting from prescribed fires. Regional and global effects to air quality would be small due to the relatively small scale of these actions (VM-FEIS, Volume I, page IV-122). Cumulative effects on air quality would be minimal for this alternative.

**Alternative 1.** Effects to air quality would be negligible under this alternative. Air quality standards would remain status quo in the project area. However, in the absence of prescribed burning, there is an increased possibility for more wildfires to occur with the chance that the higher intensity fire would contribute even higher levels of air pollution than prescribed burning (VM-FEIS Vol 1. Page IV-107).

A more detailed discussion of the general effects of fire management on air quality can be found in the FEIS on pages 4-2 through 44-3 and in the USDA Forest Service, RMRS-GTR-42, Vol. 5, 2000).

### 3.5 HERITAGE RESOURCES

The Heritage staff reviewed the proposed action and found that prescribed burning would not adversely affect any Historic Properties as defined in 36 CFR 800. A heritage Management Summary detailing this finding of “no adverse effect” has been submitted to the Texas Historic Preservation Office (SHPO) and other interested parties.

**Proposed Action.** Prescribed burning could destroy any above ground features and heavy equipment used to construct the control lines could damage sub-surface features if present. The areas proposed in the project have previously been burned and control lines constructed. Existing control lines will be used, therefore the risk of damaging/destroying existing features is small.

**Alternative 1.** There would be no direct or indirect effect on heritage resources. No control lines would be constructed and no ignitions would take place.

### 3.6 PUBLIC HEALTH AND SAFETY

#### 3.6.1 Affected Environment

The DCNF is in a rural setting with a dispersed population. Several small communities are scattered throughout the vicinity. U.S. 287 is located near the western boundary of the DCNF and State Highways 7, 21 and 94 traverse the forest. In addition there are several Farm-to-Market and county roads that criss-cross the project area. Additionally, the forest is extremely fragmented with private land interspersed across the forest landscape.

Prescribed burning may potentially affect residents and forest users. Prescribed fire is the only vegetative management method that emits substantial amounts of gases and particulate matter into the atmosphere (VM-FEIS Volume I, Page IV-106). A potential risk to public safety is created by smoke from prescribed burning which can impact local individuals with respiratory problems, and can reduce visibility on highways and roads. More specifically the potential for serious injury or death resulting from public entrapment exist within the burn areas.

In addition, illegal dumping poses another hazard to Forest Service personnel and the public as toxic smoke can result from burning debris (chemicals, metals, old tires, etc). Law enforcement issuing violation notices and Forest Service clean-up efforts have reduced the risk somewhat.

### 3.6.2 Effects on Public Health and Safety

**Proposed Action.** The effects of smoke on public health and safety are similar to the effects on air quality discussed in Section 3.6. Smoke warning signs will be placed where visibility on local roads and highways might be affected by prescribed fires. In addition, posting of trails and recreation areas prior to implementation and patrol during and following would mitigate the effects of smoke on forest visitors. With proper planning there is no expectation of public road closures however Texas Department of Transportation has the authority to close roads if smoke adversely impacts travel ways. Additionally, Forest Service personnel will conduct smoke patrols following the burns to identify if there are any potential hazards. National Forest System Roads in close proximity to the burn may be closed if smoke impedes traffic. Prescribed burning of compartments will be spread over space and time to minimize local cumulative smoke effects. With these measure, effects from smoke are expected to be short-term and with locally acceptable levels.

Management of smoke impact issues will be mitigated by complying with burn plan parameters developed to maximize smoke dispersal. The safety of Forest Service personnel and the public would be protected by following proper safety procedures including utilizing personal protective equipment, using only qualified personnel, following an approved burn plan, adhering to smoke management guidelines, conducting smoke patrols, posting burn areas of intent to burn prior to implementation, notifying local residents of planned burned areas, reconnaissance of burn area to locate forest visitors prior to ignition. The effects of smoke could pose a hazard to sensitive individuals but burning would be conducted when conditions would minimize these effects. Therefore, adverse effects to workers and public from exposure to smoke are considered to be minimal and short-term. The major effects of particulate matter are reduced visibility and respiratory impairment (VM-FEIS, Vol. I, pages IV-108-IV-110). These effects will be minimized through implementation of the management requirements identified in the Plan.

**Alternative 1.** There would be no direct effects on public health and safety from the prescribed burning. However, in the absence of prescribed burning, there is an increased possibility for wildfires to occur. These fires may occur when smoke dispersal is not maximized which could increase the effects on public health and safety.

### 3.7 Climate Change

#### **Proposed Action Direct and Indirect and Cumulative Impacts**

Forests and soils have a large influence on atmospheric levels of carbon dioxide. The carbon stored in live biomass, dead plant material and soil represents the balance between carbon dioxide absorbed from the atmosphere and its release through plant respiration as well as decomposition and burning.

With this alternative, some of the carbon currently sequestered in vegetation and soils will be released back to the atmosphere. Greenhouse gas emissions and alteration to the carbon cycle will be caused by the proposed hazardous fuel reduction activities. Wildfires may still occur in the proposed project area; however, because fuel loads will have been reduced with this alternative, there will be a lower risk of a severe wildfire for the treated acres than the current condition poses. The reduced risk has a two-fold effect on greenhouse gas emissions or the carbon cycle:

1. There is a direct beneficial effect on climate change of decreased greenhouse gas emissions from the treated acres because the risk of acres being burned by severe wildfires will be reduced.
2. There is an indirect beneficial effect because live stands of trees will retain higher capacity to sequester carbon dioxide compared to stands killed by severe wildfires, especially if not immediately reforested.

Technological knowledge to specifically link climate change to small-scale projects is currently lacking. Although the effects of greenhouse gas emissions in the global aggregate are well documented, it is currently not possible to determine what specific effect greenhouse gas emissions resulting from a particular activity might have on the environment.

#### **Alternative 1**

##### **Direct and Indirect and Cumulative Impacts**

It is currently not possible to predict the actual effects of a project on global climate change, so a baseline comparison cannot be made using the no action alternative relative to climate change.

Because fuel loads within the majority of the proposed project area will not be reduced, the potential for a severe wildfire will persist and will increase as fuels are added to the forest floor through natural processes. In such an event, the quantities of carbon dioxide and other greenhouse gas emissions released into the atmosphere would be expected to be greater than those that would have been released under the controlled conditions of a prescribed burn or in an area where fuel reduction treatments had been conducted. The actual quantity of emissions released would depend on the acreage burned, tons of fuel consumed and the amount of time required to suppress the wildfire.

## Chapter 4

### Preparers and Consultation with Agencies, Organizations, and Persons

#### 4.1 Preparers & Contributors to Analysis

##### ID Team Members

Daniel Jauregui  
Kerry Hogg  
Bobi Stiles  
Gerald Lawrence  
Cheryl Prewitt

##### Consultants

Tom Philipps  
Nancy Snoberger  
Kyran Kelley  
Dawn Carrie  
Frank Stranimier  
Holly Erimias  
Paul DuFour

#### 4.2 Consultation with Other Agencies, Organizations, and Persons

##### Interested Persons

David Laney  
Wendy Ledbetter  
Janice Bezanson  
Brandt Mannchen  
John Whittle  
Stan Cook  
Buddy Davis  
Kathleen Davis  
Richard Donavan  
Dick Artley  
Bill Hallmon  
Ray Hooper  
James Johnston  
Andy Jones  
Carl Watts  
Jennifer Fairbrother  
Julie Shackelford  
Ronald Hufford

##### The Nature Conservancy

Laura Huffman

##### Texas Parks & Wildlife

Bill Adams  
Mike Berger  
Dick Pike

##### Texas State Historic Preservation Office

James Bruseth

##### Texas Forest Service

Tom Boggus

##### US Fish & Wildlife Service

Robert Allen

##### Texas A&M Dept. of Forest Science

Diana Burton

##### County Judges

Doug Page  
Chris Von Doenhoff

##### National Wild Turkey Federation

## Chapter 5 LITERATURE CITED

National Wildfire Coordination Group. 2008. Interagency Prescribed Fire Planning and Implementation Procedures Guide.

The Nature Conservancy, Nacogdoches, Texas and Stephen F. Austin State University, Nacogdoches, Texas. 1999. Ecological Classification System for the National Forests and Adjacent Areas of the West Gulf Coastal Plain, pages 7-4, 22-1 through 22-8.

U.S. Department of Agriculture, Forest Service. 2007. National Forests and Grasslands in Texas Non-Native Invasive Plant Species Project.

U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2000. General Technical Report RMRS-GTR-42-volume 2, Chapter 4. Fire in Eastern Ecosystems.

\_\_\_\_\_. 2002. General Technical Report RMRS-GTR-42-volume 5. Wildland Fire in Ecosystems, Effects of Fire on Air.

U.S. Department of Agriculture, Forest Service Southern Region. 1996. Final Environmental Impact Statement (FEIS) for the Revised Land and Resource Management Plan.

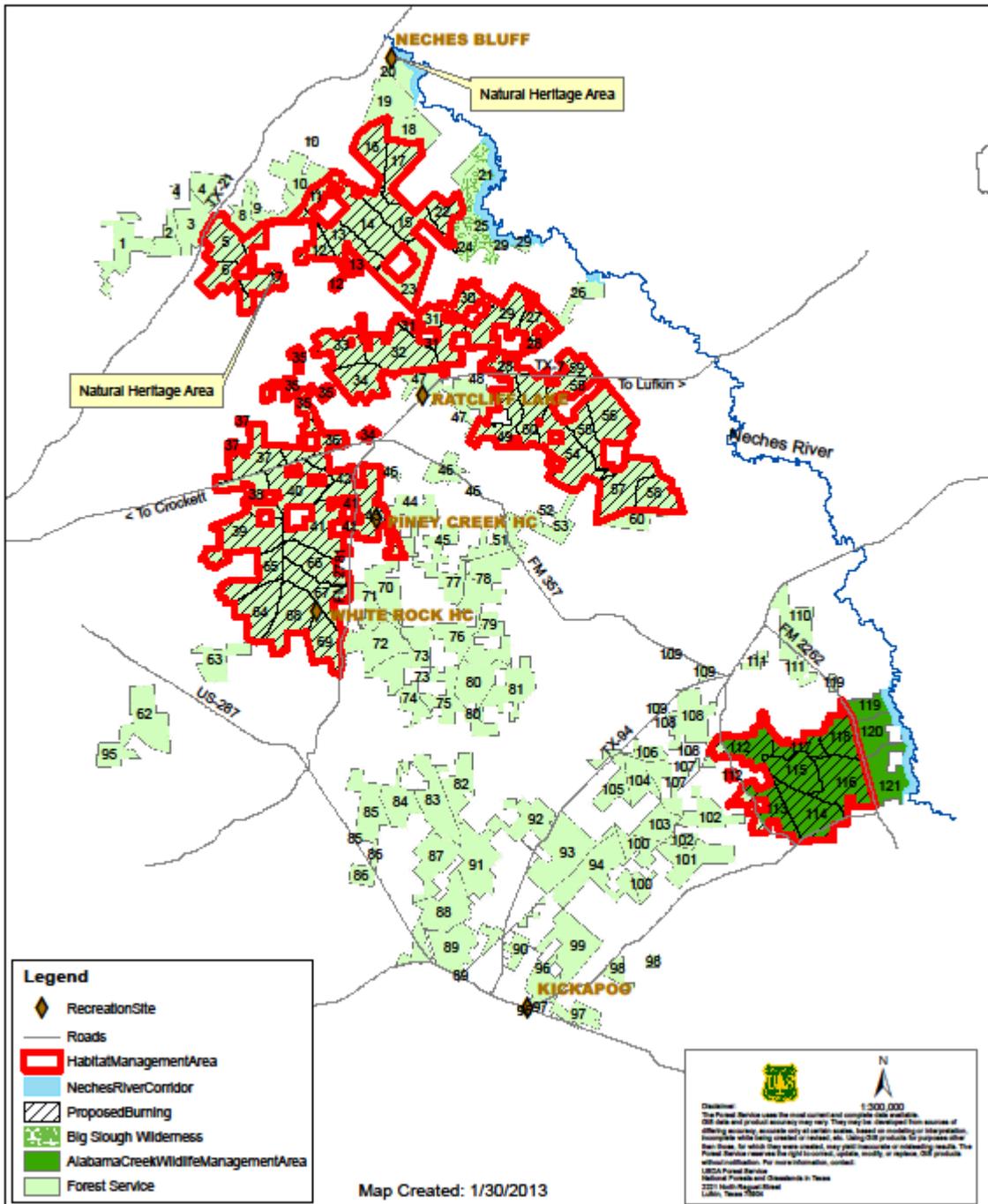
\_\_\_\_\_. 1989. Final Environmental Impact Statement Vegetation Management in the Coastal Plain/Piedmont (Volume 1) pages II-20 through II-23 and IV-30 through IV-41, IV-79.

U.S. Fish and Wildlife. 2003 Second Revision Red-cockaded Woodpecker Recovery Plan (RCW Recovery Plan) 2003: pages 162-205 (Section 8 Guidelines).

Fire Regime Condition Class. [www.frcc.gov](http://www.frcc.gov) accessed 1/29/2013.

**APPENDIX A**  
**MAP OF PROPOSED TREATMENT AREAS**

# DCNF RCW Prescribed Burning Project



**APPENDIX B  
SPECIALISTS REPORTS**

**BOTANY REPORT  
FOR THREATENED AND ENDANGERED SPECIES,  
SENSITIVE SPECIES, INVASIVE SPECIES, and  
MANAGEMENT INDICATOR SPECIES**

**Davy Crockett Prescribed Burning Project**

**Davy Crockett National Forest**

HOUSTON AND TRINITY COUNTIES, TEXAS

November 7, 2012

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Prepared by  
Thomas Philipps  
Forest Botanist  
National Forests and Grasslands in Texas  
Supervisor's Office

## **INTRODUCTION AND PROPOSED ACTION**

### **BACKGROUND**

THE COMPARTMENTS PROPOSED FOR PRESCRIBED BURNING HAVE PREVIOUSLY BEEN BURNED EITHER FOR FUELS REDUCTION, RED-COCKADED WOODPECKER (RCW) HABITAT IMPROVEMENT, CONTROL OF UNDERSTORY SPECIES, SITE PREPARATION, OR TO ENCOURAGE THE ESTABLISHMENT OF NATIVE GRASSES.

THE PROJECT WILL OCCUR PRIMARILY ON UPLAND PINE AND PINE-HARDWOOD FORESTS IN MANAGEMENT AREA 1 (MA-1) UPLAND FOREST ECOSYSTEMS AND MANAGEMENT AREA 2 (MA-2) RED-COCKADED WOODPECKER (RCW) EMPHASIS. AREAS WITHIN MANAGEMENT AREA 4 (MA-4) STREAMSIDE MANAGEMENT ZONES THAT LIE ADJACENT TO UPLAND SITES ARE INCLUDED WITHIN THE PRESCRIBED BURN AREAS WHERE THEY CANNOT BE EXCLUDED WITHOUT THE CONSTRUCTION OF GROUND-DISTURBING FIRELINES.

THE PRESCRIBED BURNING WILL AID IN MEETING THE DESIRED FUTURE CONDITIONS OF THE AREAS AS DESCRIBED IN THE 1996 REVISED LAND AND RESOURCE MANAGEMENT PLAN FOR THE NATIONAL FORESTS AND GRASSLANDS IN TEXAS (THE PLAN). THE PLAN'S DESIRED FUTURE CONDITIONS FOR MA-1 AND MA-2 ON THE DAVY CROCKETT NATIONAL FOREST INCLUDE LANDSCAPES OF OPEN PINE FORESTS MIXED WITH SOME HARDWOODS WITH LITTLE TO NO HARDWOOD COMPONENTS HARMONIZE WITH AN HERBACEOUS UNDERSTORY. DESIRED FUTURE CONDITIONS WITHIN MA-4 VARY WIDELY ACROSS THE FOREST, RANGING FROM OPEN MIXED PINE-HARDWOOD FOREST ALONG MINOR STREAMS TO HARDWOOD-DOMINATED FOREST ALONG MAJOR PERENNIAL STREAMS WITH BROAD FLOODPLAINS.

IN THE RCW HABITAT MANAGEMENT AREAS (HMAS) THAT COMPRISE MA-2, THE PRIMARY OBJECTIVE OF BURNING IS TO CREATE AN OPEN, PARK-LIKE VIEW WITH LITTLE TO NO HARDWOOD COMPONENTS AND A HERBACEOUS UNDERSTORY. PRESCRIBE BURNING IN MA-2 WOULD ALSO BENEFIT EASTERN WILD TURKEY AS WELL AS OTHER GROUND-NESTING SPECIES HABITAT BY REDUCING FUEL ACCUMULATIONS THAT MAY LEAD TO CATASTROPHIC WILDFIRES. IN MA-1, THE PRIMARY OBJECTIVES ARE TO REDUCE THE ACCUMULATION OF FUELS THAT MAY LEAD TO CATASTROPHIC WILDFIRES, MAINTAIN OR ENHANCE THE HABITAT FOR GROUND NESTING BIRDS, AND TO CREATE SUITABLE HABITAT FOR THE REINTRODUCTION OF THE EASTERN WILD TURKEY. PRESCRIBED FIRE WILL PRESERVE THE DIVERSITY OF THE TRANSITION ZONES BETWEEN UPLAND MANAGEMENT AREAS (MA-1 AND MA-2) AND MA-4 WITHOUT ADVERSELY AFFECTING THE MOISTER HARDWOOD-DOMINATED AREAS.

A PORTION OF THE PROJECT AREA LIES WITHIN THE BOUNDARIES OF THE ALABAMA CREEK WILDLIFE MANAGEMENT AREA, WHICH HAS BEEN MANAGED

JOINTLY WITH TEXAS PARKS AND WILDLIFE DEPARTMENT (TPWD) SINCE 1981, TO PROVIDE ADEQUATE WILDLIFE RESOURCES FOR PUBLIC ENJOYMENT SUCH AS WHITE-TAILED DEER AND EASTERN WILD TURKEY.

OTHER AREAS INCLUDED IN THIS PROPOSAL ARE: THE NECHES RIVER CORRIDOR (MA 8B – PROTECTED RIVER AND STREAM CORRIDORS) IN COMPARTMENTS 20, 26, 119, 120, AND 121; TEXAS NATURAL HERITAGE AREAS IN COMPARTMENTS 7 AND 20 (MA-8D – NATURAL HERITAGE AREAS); RATCLIFF LAKE RECREATION AREA (MA-9A – DEVELOPED RECREATION SITES); AND NECHES BLUFF AND PINEY CREEK HORSE CAMPS (MA-9B - MINIMALLY DEVELOPED RECREATION SITES). ACCORDING TO THE PLAN, PRESCRIBED FIRE MAY BE USED IN THESE AREAS TO MAINTAIN OR ENHANCE DESIRED CONDITIONS, BOTANICAL CHARACTER, VISUAL QUALITY, OR RECREATION EXPERIENCE.

FIRE REGIME CONDITION CLASS IS A MEASURE OF THE AMOUNT OF DEPARTURE FROM THE NATURAL FIRE REGIME. THE DESIRED CONDITION, CONDITION CLASS 1, IS CONSIDERED A LOW DEPARTURE FROM NATURAL CONDITIONS WHERE VEGETATION CHARACTERISTICS, FUEL COMPOSITION, AND FIRE BEHAVIOR IS WITHIN THE HISTORICAL RANGE OF VARIABILITY AND THERE IS A LOW RISK TO KEY ECOSYSTEM COMPONENTS. MANY OF THE AREAS INCLUDED IN THIS PROJECT ARE CATEGORIZED AS CONDITION CLASS 2 OR 3, WHERE VEGETATION STRUCTURE, FUEL LEVELS, AND FIRE SEVERITY ARE OUTSIDE THE NORMAL RANGE AND THERE ARE MODERATE TO HIGH RISKS OF LOSING KEY ECOSYSTEM COMPONENTS.

COMPARTMENT	ACRES	COMPARTMENT	ACRES
1	1615	56	1734
2	727	57	1946
3	1289	58	1215
5	1328	59	588
6	1076	60	764
7	1207	62	2078
11	500	64	1561
12	845	65	1292
13	1302	66	1354
14	2261	67	1441
15	1598	68	1877
16	1275	69	1301
17	1249	70	1329
18	1096	71	914
19	1561	72	1824
20	1053	73	1785
22	1144	76	1003
26	929	78	2027
27	835	79	1307
28	773	94	2406

29	1726	95	505
30	1731	100	1172
32	2072	33	985
34	1440	101	1678
35	1340	104	896
36	810	105	1075
37	1055	106	479
39	2173	110	1466
40	1929	112	1598
41	1977	113	1700
42	970	114	2006
43	1848	115	1443
46	729	116	2201
47	1351	117	792
48	975	118	1284
49	1515	119	900
50	1562	120	1249
54	2434	121	2046
55	1732		

## PROPOSED ACTION

THE ACTION PROPOSED BY THE FOREST SERVICE TO MEET THE PURPOSE AND NEED INCLUDE:

- PRESCRIBE BURNING OF APPROXIMATELY 107,000 ACRES ON A 1-5 YEAR CYCLE
- CLEARING CONTROL LINES ALONG PRIVATE PROPERTY BOUNDARIES
- UTILIZE EXISTING ROADS AND/OR STREAMS WHERE POSSIBLE TO SERVE AS CONTROL LINE

## THREATENED AND ENDANGERED SPECIES

The project will not impact any listed Threatened and Endangered Species. I reviewed the current list of species (Table 1) for the counties that contain the Davy Crockett National Forest. Texas Prairie Dawn (*Hymenoxys texana*) is the only listed plant species known to occur in Trinity County. However, it typically occurs in poorly drained, sparsely vegetated areas ("slick spots") at the bases of small mounds (mima or pimple mounds) in open grassland or in almost barren areas. Soils are slightly saline, sticky when wet and powdery when dry. There is a small population of this species located on lands managed by International Paper adjacent to the Davy Crockett NF, but there are no known occurrences of this species within the Davy Crockett NF and past surveys have failed to locate any suitable habitat within the forest. There is no suitable

habitat for this species within the project area. As such, there will be **no effect** to this or any other federally listed plant species due to the proposed action and they will be dropped from further consideration herein.

Table 1: Federally- listed plant species known to occur and/or adjacent to various units of the National Forests and Grasslands in Texas (NFGT).

Common Name	Scientific Name	NFGT Distribution and Habitat	Individual NFGT Units	
			Species Known To Occur	Is Suitable Habitat Present Within Project Area?
White bladderpod	<i>Lesquerella pallida</i>	Weches formation	Not on any NFGT units	
Earthfruit	<i>Geocarpon minimum</i>	Saline glades and barrens		
Texas prairie dawn	<i>Hymenoxys texana</i>	Saline glades and barrens		
Navasota ladies'-tresses	<i>Spiranthes parksii</i>	Catahoula pine barrens	Angelina NF	No

## REGION 8 SENSITIVE SPECIES

Information on R8 sensitive species status, distribution, and ecology was derived from Texas Natural Heritage Program (TNHP) data base maps and reports, Texas Parks and Wildlife (TPWD) habitat mapping, personal knowledge from Forest Service botanists, various scientific studies and reports, field surveys described below, and an extensive compilation of information contained in the Forest Plan (USFS 1986).

Determination of risks to populations of sensitive plants considers the size, density, vigor, habitat requirements, locations of the population, and consequences of adverse effects on the species as a whole within its range and within the Davy Crockett NF.

I have reviewed the current list of Region 8 (R8) sensitive plant species, the disturbed habitats to be affected, the habitat affinities of the R8 sensitive plant species (Table 2), the presence of suitable habitat within the proposed project area, and any known occurrence records for those species listed in Table 2. There is suitable habitat present within the project area for three species, *Crataegus warneri*, *Hibiscus dasycalyx*, and *Amorpha paniculata* and are known to exist within the project area.

Table 2. This table is “Step 1” of a Biological Evaluation, a pre-field checklist of Region 8 Sensitive Species (plants) that may occur or their habitat may be present on the Davy Crockett NF. Only the species that either occur or have suitable habitat within the project area will be carried through analysis. Fish, amphibians, insects, other invertebrates, and terrestrial wildlife will be covered in other reports.

**Table 2: R8 Sensitive plant species known to occur and/or having suitable habitat on various units of the NFGT**

Common name	Scientific name	NFGT distribution and habitat	Individual DCNF units	
			Species known to occur on Forest?	Is suitable habitat present within project area?
Panicled indigobush	<i>Amorpha paniculata</i>	In bogs, bayballs, and streamside zones.	Yes	Yes
Incised groovebur	<i>Agrimonia incisa</i>	Angelina NF in sandy longleaf savanna	No	
Texas bartonia	<i>Bartonia texana</i>	Angelina and Davy Crockett NF in baygalls	No	
Warner's hawthorn	<i>Crataegus warneri</i>	Davy Crockett NF in deep sandy soils	Yes	Yes
Mohlenbrock's umbrella sedge	<i>Cyperus grayoides</i>	Angelina and Sabine NF in xeric sandylands	No	
Southern ladies'-slipper	<i>Cypripedium kentuckiense</i>	Angelina and Sabine NF in beech-white oak ravines	No	
Comanche peak prairie clover	<i>Dalea reverchonii</i>	LBJ Grasslands on goodland limestone soils	No	
Neches river rose mallow	<i>Hibiscus dasycalyx</i>	Davy Crockett NF in sloughs and marshes	Yes	Yes
Pineland bogbutton	<i>Lachnocaulon digynum</i>	Angelina and Sabine NF in hillside seepage slope bogs	No	
Texas golden gladecress	<i>Leavenworthia texana</i>	Weches formation	No	
Slender gayfeather	<i>Liatris tenuis</i>	Angelina and Sabine NF in sandy longleaf pine savanna	No	
Yellow fringeless orchid	<i>Platanthera integra</i>	Angelina NF in hillside seepage slope bogs	No	
Barbed rattlesnake root	<i>Prenanthes barbata</i>	Angelina and Sabine NF in beech-white oak ravines	No	
Large beakrush	<i>Rhynchospora macra</i>	Angelina NF in hillside seepage slope bogs	No	
Sabine coneflower	<i>Rudbeckia scabrifolia</i>	Angelina and Sabine NF in hillside seepage slope bogs and baygalls	No	
Texas sunnybells	<i>Schoenolirion wrightii</i>	Angelina NF in catahoula pine barrens	No	
Scarlet catchfly	<i>Silene subciliata</i>	Sabine NF on sandy post oak hillsides	No	
Clasping twistflower	<i>Streptanthus maculatus</i>	Sabine NF where glauconite is present	No	

Common name	Scientific name	NFGT distribution and habitat	Individual DCNF units	
			Species known to occur on Forest?	Is suitable habitat present within project area?
Texas trillium	<i>Trillium texanum</i>	Angelina NF in baygall ecotones	No	No
Drummond's yellow-eyed grass	<i>Xyris drummondii</i>	Angelina NF in hillside seepage slope bogs	No	No
Louisiana yellow-eyed grass	<i>Xyris louisianica</i>	Angelina NF in hillside seepage slope bogs	No	No
Harper's yellow-eyed grass	<i>Xyris scabrifolia</i>	Angelina and Sabine NF in hillside seepage slope bogs	No	No

### Sensitive Plants

Records of past species occurrence reports and aerial photography was reviewed in order to determine presence/absence or areas of potential suitable habitat for these species. Three species listed in Table 2 (*Crataegus warneri*, *Hibiscus dasycalyx*, and *Amorpha paniculata*) do have affinities to project area habitats and/or have distributional ranges that overlap the project area and are known to exist within the project area.

#### Crataegus warneri (Warner's Hawthorn)

*Crataegus warneri* is a Texas endemic found in four counties in East Texas: Anderson, Houston, Morris, and Walker. It occurs on the margins of upland oak-hickory and oak-hickory-pine woodlands or forests, mostly on deep sandy soils, and in deep xeric Blackjack oak sandhill communities on ridgetops, and sideslopes, often in bare sandy soil with little to no competition. The threat of habitat destruction is high in this region due to silvicultural and agricultural expansion, fire suppression, and urban and suburban development. It has a global conservation rank of G3 and a Texas conservation rank of S3 (vulnerable).

A baseline population survey conducted by Singhurst in 1994 resulted in the documentation of three occurrence records, all within the Davy Crockett NF. Another survey conducted in association with a land exchange in the late 1990s resulted in the documentation of two more populations, again on deep sands within the Davy Crockett NF. There are currently seven known populations of this species on the NFGT, all within the Davy Crockett NF.

#### Direct/Indirect Effects

This species is most often found in deep loose sands on hilltops and stream terraces with little to none vegetative competition. This suggests that *Crataegus warneri* prefers frequent fires or other disturbances that would minimize the amount of shrub encroachment on sites and thus allow for

less competition. These disturbances (mowing, wind, fire etc.) are needed to maintain open habitat. Hurricane Ike and other wind events caused large areas of downed trees thereby reducing competition for this species. The activities under the proposed action will be beneficial for this species in the short-term, as additional suitable habitat will be created by the removal of competing vegetation. There is some detriment associated with the proposed action as there is a chance for the species to be damaged or destroyed from equipment through soil compaction if activities occur where the species is actually present. However the benefits from the creation of suitable habitat outweigh these risks. In the long term, without additional disturbances (like prescribed fire) to maintain the open non-competitive habitat conditions that this species prefers, population decline may follow.

### **Cumulative Effects**

The open conditions necessary for this species to exist and thrive need to be maintained through additional disturbances. Periodic wind events will reduce woody competition if *Crataegus warneri* can also survive the event. Since this species is fire dependent and tolerates fire events well, the application of prescribed fire is the most important tool to maintain suitable habitat for the species. Prescribed fire events are commonly used where this species exists on USFS lands as a management tool and that in itself should preserve species viability. However, mulching, chipping, or other mechanical methods of vegetation controls used as a management tool where this species exists should be avoided. Because this species occurs in other locations on the Davy Crockett NF where project activities other than prescribed fire are not scheduled to occur, species populations should remain constant.

The proposed action “**may impact individuals but not likely to cause a trend to federal listing or a loss of viability**”

### **Hibiscus dasycalyx (Neches River Rose Mallow)**

Neches River Rose Mallow is a Texas endemic that was federally declared a Candidate species on May 4, 2004. The known range of this species is limited to the Davy Crockett NF (DCNF) on the NFGT, but suitable habitat may occur elsewhere. It is generally found to occur within openings in shrub swamps or along the margins of riparian woodlands in seasonally wet soils (often found near standing water). Sites are typically flooded during late winter and early spring, but the surface soils are often quite dry by late summer. In 2004, it was known from only six sites in three east Texas counties. All of the occurrences are subject to genetic swamping by more common *Hibiscus* species that are perhaps better adapted to human-disturbed conditions. The Global Status of this species is classified as G1-Critically Imperiled, and S1-Critically Imperiled for the state of Texas (NatureServe 2006). The viability of this species is considered to be at high risk of failing.

All known occurrences of Neches River Rose Mallow on the NFGT are located on the Davy Crockett NF. Records of surveys are somewhat spotty, but four occurrences had been documented by the early 2000's. These four occurrences were relocated by Philipps in 2005, and have been subsequently monitored in 2006 and 2007. An expedition by Loos down the Neches River from Neches Bluff past the Big Slough Wilderness area in 2010 and 2012 resulted

in the documentation of four locations for this species, however two of the occurrences appeared to be hybrids and the one seemingly genetically pure occurrence occurred within a private inholding.

All four known sites were visited in 2011 by a group including Singhurst, Poole, Philipps, Loos, and several representatives from U.S. Fish and Wildlife Service as part of an evaluation process for possible listing of this species under the Endangered Species Act. Viable plants were found at all four sites. Occurrences seemed healthy despite being somewhat stunted due to the drought and visible predation from animals and insects. Past flowering with seed production was observed in all sites. Chinese tallow was observed in all locations. Philipps and Loos also surveyed several other areas of suitable habitat within Compartments 54 and 49 without success. Later, Loos surveyed areas around Slay Creek and Barton Branch within Compartments 118, 120, and 121 again without success.

This species does not generally occur in bottomland streamside habitat but rather on or near the edges of small lakes, sloughs, and seasonally wet buttonbush swamps. It does tend to hybridize with other members of this genus, thereby making identification sometimes difficult. It has limited distribution on the NFGT. Past re-stocking efforts have proven to have mixed results. A re-introduction program should be initiated to supplement past efforts. Chinese tallow needs to be eradicated from all known sites.

Existing population inventory information across the project area is adequate for this species. Resource Protection Measures that require adherence to MA-4 guidelines, site-specific surveys prior to implementing treatments, other project design criteria aimed at eliminating soil disturbing activities where this species may occur, and other restrictions related to work in wet areas will allow this project to be implemented without negatively impacting this species. Fire would not be directly applied to riparian areas; rather, low intensity fire would be allowed to back into streamside vegetation (the Plan, p. 155) where it generally goes out naturally. The application of prescribed fire as a management tool in the project area will have “**no effect**” to this species since any prescribed fire applied would extinguish naturally upon reaching the wet substrate where this species occurs.

### **Amorpha paniculata (Panicled False Indigo)**

*Amorpha paniculata* is assigned a rounded global rank of G2 (imperiled) and a Texas state rank of S2 (imperiled). It has a limited range in the south-central U.S. and is considered rare in most if not all of that range. It occurs in deep acid woodlands and bogs over Letney (Arenic Paleudults) soils within the Catahoula Formation. *Amorpha paniculata* is a stout shrub that grows in deep acid woodlands and bogs in East Texas. Most habitat occurs within streamside management zones. It is distinguished from other *Amorpha* species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage. It flowers between May and June. Threats include shading and overstocking of pines. Also, lack of fire is a major threat but some sites are being managed with fire. Many sites are on roadsides at stream crossings.

Surveys in areas of suitable habitat were conducted for this species by Philipps in 2005 and by Bridges, Singhurst, Nilles, and Philipps in 2006. This species is known to occur within Compartments 72, 85, 87, 90 and 92 in the Angelina NF and Compartment 139 in the Sabine NF. Recently, this species was found by Walker and Philipps in Compartment 18 on the Davy Crockett NF, again at a stream crossing. Additional occurrences are expected with more survey work.

Existing population inventory information across the project area is not adequate for this species. However, Resource Protection Measures that require adherence to MA-4 guidelines, site-specific surveys prior to implementing treatments, and other project design criteria aimed at eliminating soil disturbing activities where this species may occur, and other restrictions related to work in wet areas will allow this project to be implemented without negatively impacting this species. This is a fire dependent species. The application of prescribed fire as a management tool in the project area will have “**beneficial impacts**” to this species since prescribed fire would reduce shading by non-selective mid-story reduction, and reduce overstocking thereby allowing more sunlight to reach the lower mid-story/herbaceous layer of the forest.

## MANAGEMENT INDICATOR SPECIES

The USFS identified Management Indicator Species (MIS) to provide a means to monitor selected issues on the Forest as required by regulation (36 CFR 219.19, 1982). MIS are those whose response to management activities can be used to predict the likely response of a larger group of species with similar habitat requirements. In addition, selected MIS should be those whose change in population would be directly attributable to the management action. Strategies and objectives found in the 1996 Forest Plan direct the Forest to provide ecological conditions that sustain viable populations of MIS and to demonstrate positive trends in habitat availability, quality, or other factors affecting the species.

Monitoring is conducted for each MIS on the Forest to obtain the data elements necessary to meet the intent of the regulations defining MIS. The USFS is implementing monitoring for each MIS Forest-wide within the constraints of the budget and workforce. Monitoring information will guide the Forest in determining where and how to spend scarce resources in order answer the MIS questions raised during the development of the Revised Forest Plan. Results of the annual monitoring program are included in the Forest-wide Monitoring Report. Population and habitat trends for all MIS are reflected in this report and guide Forest management programs.

The MIS are meant to be a Forest-wide issue. Project-level activities are evaluated in relation to how they affect Forest-wide population and habitat trends.

Table 3 represents the management indicator species (plants) evaluated with this proposal. Any MIS fish, amphibians, insects, other invertebrates, and terrestrial wildlife will be covered in other reports.

**Table 3: Management Indicator Species (Plants)**

Management Indicator Species (MIS)	Species Present in project area? (Y/N)	Habitat Represented	Habitat Present on Forest? (Y/N)	Analyzed in this document? (Y/N)
Nodding Nixie ( <i>Apteria aphylla</i> )	N	Baygalls and acidic woods	Y	N
Louisiana Squarehead ( <i>Tetragonotheca ludoviciana</i> )	Y	Longleaf pine and/or bluejack oak sandhills	Y	Y

From the list of Forest-wide MIS above these species were identified as project MIS, based on Forest Plan selection criteria and their presence, potential occurrence, and/or their habitats within or adjacent to the proposed project area. Other MIS were not selected as project MIS because they do not occur in the project area and they and their associated habitats would not be affected by any proposed activities. Based on the habitats to be affected and the habitat affinities of the management indicator plant species (Table 3), the Davy Crockett Prescribed Fire Project will have “**beneficial impacts**” for *Tetragonotheca ludoviciana* and will have “**no impact**” on *Apteria aphylla* due to the species not being present within the project area. The management indicator plant species listed in Table 3 that either are known to occur or have suitable habitat in the project area have been identified and will be incorporated in further effects analysis.

### Louisiana Squarehead

Known also as the Sawtooth Nerveray, this species has been recorded in 19 east Texas counties as well as in western Louisiana and extreme southwest Arkansas (according to the TNHP report). Louisiana squarehead is restricted to sandy soils in sandhill woods and xeric sandhills in longleaf pine savannas. Known populations are small in number of individuals (Rob Evans personal communication), and are known to occur on Davy Crockett and Angelina NFs. Frequent fires should help maintain this species. Periodic prescribed burning would retard woody invasion, thereby maintaining open sandy areas with little competition. It is a fire-adapted species and appears to respond well to any fire intensity, as has been documented following the wildfire in C-77 of the Angelina NF where this species was seen to flourish as the result of that very intense fire. Also, the numbers of individuals found within road ROWs suggests that this species does well when there is a lack of woody competition. The Global Status of the Louisiana Squarehead is classified as G4-Apparently Secure, and S3-Vulnerable for the state of Texas (NatureServe 2006).

### Available Inventories

Surveys conducted by MacRoberts in 1995 resulted in the documentation of 5 occurrences on the Angelina NF. Inventories and monitoring following the February 10, 1998 windstorm blowdown found an additional population on the northern Angelina NF and one population on the Sabine NF. More surveys conducted in 2005 by Philipps resulted in the relocation of several occurrences on the Davy Crockett NF and two new occurrences on the Angelina NF. The current known occurrences are estimated at 20. The short-term objective in the Plan is 20 occurrences and the long-term objective is 25. A hillside seepage slope bog floristic survey

conducted between 8/8/06-8/11/06 resulted in the inadvertent documentation of one additional population of this species in C-92 of the Angelina NF. In 2007, surveys conducted on the Angelina NF in the Upland Island Wilderness located one new population. Philipps and Walker surveyed for this species in 2009 resulting in the documentation of two new occurrences, both occurring on the top of xeric bluejack oak sandhills. Philipps and Loos documented a very large occurrence in Compartment 1 in 2010. Also in 2010, Elliott discovered a new occurrence on the Sam Houston NF in a ROW within Compartment 37. In 2011, Loos documented a new occurrence within the Upland Island Wilderness. As more southern pine habitat is managed with fire and overall fire frequency is increased, potential increases in sites with this fire-dependent plant may be possible.

On the Davy Crockett NF, Philipps conducted surveys for Louisiana squarehead in 2005 and re-documented four occurrences. In 2010, Loos surveyed areas in and around the Northwest corner of the forest and did relocate one known occurrence but failed to discover any new locations. This species has been documented on the District in Compartments 1, 9, 10, 16, and 17. All occurrences are located within roadside ROWs.

This species is most often found in deep loose sands on xeric Blackjack, bluejack, or post oak hilltops. It is also often found on frequently maintained roadsides. This suggests that *Tetragonotheca ludoviciana* prefers frequent fires or other disturbances, such as mowing, that would minimize the amount of shrub encroachment on sites and thus allow for less competition. These disturbances (mowing, wind, fire etc.) are needed to maintain open habitat. Hurricane Ike and other wind events caused large areas of downed trees thereby reducing competition for this species. The activities under the proposed action will be beneficial for this species in the short-term, as additional suitable habitat will be created by the removal of competing vegetation. There is some detriment associated with the proposed action as there is a chance for the species to be damaged or destroyed from equipment through soil compaction if activities occur where the species is actually present. However the benefits from the creation of suitable habitat outweigh these risks. In the long term, without additional disturbances (like prescribed fire or mowing) to maintain the open non-competitive habitat conditions that this species prefers, population decline may follow.

The open conditions necessary for this species to exist and thrive need to be maintained through additional disturbances. Periodic wind events will reduce woody competition for *Tetragonotheca ludoviciana*. Regular maintenance of roads through mowing will also reduce competition. Since this species has a very tough corm deep in the ground, it can survive most disturbances at the surface and resprout. Since this species is fire dependent and tolerates fire events well, the application of prescribed fire is the most important tool to maintain suitable habitat for the species. Prescribed fire events are commonly used where this species exists on USFS lands as a management tool and that in itself should preserve species viability. The application of prescribed fire as a management tool in the project area will have **beneficial impacts** to this species since prescribed fire would reduce woody competition by top-killing shrubs, reduce shading by non-selective mid-story reduction, and reduce overstocking thereby allowing more sunlight to reach the lower mid-story/herbaceous layer of the forest. Because this species occurs in other locations on the Davy Crockett NF and eastward into the Angelina NF where project

activities other than prescribed fire are not scheduled to occur, species populations should remain constant.

### Non-Native Invasive Plant Species (NNIPS)

Surveys for invasive species within the National Forests and Grasslands in Texas are conducted on a yearly basis. The following invasive species are a concern:

#### Species currently present on the NFGT

Common Name	Scientific Name	Common Name	Scientific Name
Chinaberry	<i>Melia azedarach</i> MEAZ	Mimosa	<i>Albizia julibrissin</i> ALJU
Chinese wisteria	<i>Wisteria sinensis</i> WISI	Multiflora rose	<i>Rosa multiflora</i> ROMU
Chinese/European privet	<i>Ligustrum sinense</i> LISI	Nandina	<i>Nandina domestica</i> NADO
Cogongrass	<i>Imperata cylindrical</i> IMCY	Nodding thistle	<i>Carduus nutans</i> CANU4
Deep rooted sedge	<i>Cyperus enterianus</i> CYEN2	Chamber Bitter	<i>Phyllanthus urinaria</i> PHUR
English ivy	<i>Hedera helix</i> HEHE	Periwinkles	<i>Vinca major/Vinca minor</i> VIMA
Eurasian water-milfoil**	<i>Myriophyllum spicatum</i> MYP2	Princesstree	<i>Paulownia tomentosa</i> PATO2
Giant reed or Arundo	<i>Arundo donax</i> ARDO4	Salt cedar	<i>Tamarix ramosissima</i> TARA
Golden bamboo	<i>Phyllostachys aurea</i> PHAU8	Sericea lespedeza	<i>Lespedeza cuneata</i> LECU
Hydrilla**	<i>Hydrilla verticillata</i> HYVE3	Tallowtree	<i>Triadica sebifera</i> TRSE6
Japanese climbing fern	<i>Lygodium japonicum</i> LYJA	Tree of heaven	<i>Ailanthus altissima</i> AIAL
Japanese/Glossy privet	<i>Ligustrum Japonicum</i> LIJA	Tropical soda apple	<i>Solanum viarum</i> SOVE2
Johnsongrass	<i>Sorghum halpense</i> SOHA	Tung-oil tree	<i>Vernicia fordii</i> VEFO
King Ranch bluestem	<i>Bothriochloa ischaemum</i> var. <i>songarica</i> BOISS	Water fern**	<i>Salvinia molesta</i> SAMO5
Kudzu	<i>Pueraria Montana</i> PUMO	Water hyacinth**	<i>Eichhornia crassipes</i> EICR

\*\* Aquatic species

**Species Not Yet Present on the NFGT, but Present Within the State of Texas**

Common Name	Scientific Name	Common Name	Scientific Name
Russian olive	<i>Elaeagnus angustifolia</i> ELAN	Climbing yams	<i>Dioscorea</i> spp DIOP
Autumn olive	<i>Elaeagnus umbellata</i> ELUM	Japanese knotweed	<i>Polygonum cuspidatum</i> POCU6
Bush honeysuckles	<i>Lonicera maackii</i> LOMA6	Skunkvine	<i>Paederia foetida</i> PAFO3
	<i>Lonicera morrowii</i> LOMO2	Spotted knapweed	<i>Centaurea stoebe</i> CEST8
	<i>Lonicera tatarica</i> LOTA	Peppertree	<i>Schinus terebinthifolius</i> SCTE
	<i>Lonicera fragrantissima</i> LOFR	Mourningbride	<i>Scabiosa atropurpurea</i> SCAT
Purple loosestrife	<i>Lythrum salicaria</i> LYSA2	Nepalese browntop	<i>Microstegium vimineum</i> MIVI

**Direct/Indirect Effects**

The ground disturbing activities proposed in the proposed action would have a high risk of non-native invasive plant species (NNIPS) spread in (1) habitats that have high susceptibility to NNIPS invasion or (2) areas that are already disturbed. However, a comprehensive plan of NNIPS control and prevention would be integrated into the project design for all of the proposed activities, regardless of where they would occur, which would reduce or eradicate NNIPS and improve the vigor of native vegetation, thereby increasing resistance to further NNIPS invasion. NNIPS control, including early detection and rapid response (EDRR) would be included as design criteria (USDA Forest Service, Guide to Noxious NNIPS Prevention Practices, Version 1.0, Dated July 5<sup>th</sup> 2001) and implemented under an integrated pest management (IPM) strategy. Under the preferred alternative, treatment of NNIPS would occur anywhere within the project area. Treatments would be commensurate with the location of existing populations and with NNIPS risk. Monitoring would take place to determine effectiveness of treatment.

**Cumulative Effects**

Ongoing NNIPS management in the analysis area will include any other NNIPS control actions as a result of any existing signed environmental documents, the 2008 NFGT NNIPS Management Plan, and the 2008 NFGT NNIPS EA. Any active NNIPS control for this analysis area will incorporate the 2008 NFGT NNIPS EA by reference. If the preferred alternative of the proposed action is to be implemented in the project area, it will include prescribed fire, cultural, mechanical, biological, and herbicide control of NNIPS as well as education and preventive practices as described in the 2008 NFGT NNIPS EA and 2008 NFGT NNIPS Management Plan. This alternative would follow NFGT Forest Plan management direction for NNIPS.

**NNIPS Monitoring**

Current infestations within the project area should be monitored for impacts from proposed activities as well as effectiveness of control measures. Inventory of the project area for additional infestations should be done during and following implementation of proposed activities. Monitoring would conform to that which is being conducted as part of the 1989 NFGT LRMP and 2008 NNIPS EA. Monitoring of environmental conditions would occur during direct NNIPS treatment. Monitoring of non-target resources, including wildlife, plant and animal abundance, and aquatic resources would also occur. Effectiveness monitoring would be implemented during the next growing season following treatment. Inventories for new infestations as a result of the

proposed activities would be conducted every growing season. The monitoring and inventories would be conducted by qualified invasive species, range, and/or botany personnel on the NFGT.

Wildlife Specialist Technical Report  
Prescribed Burn EA

Daniel P. Jauregui

Wildlife Biologist

This document is my analysis and includes information from the National Forest and Grasslands in Texas Forest Plan and other references. The wildlife analysis for the proposed actions will allow the decision maker to render an informed decision on the project. The wildlife analysis evaluated and analyzed habitat and effects from proposed activities for Threatened, Endangered, Proposed, Region 8 Sensitive Species, and Management Indicator Species.

### **Background**

The compartments proposed for prescribe burning have previously been burned either for fuels reduction, Red-cockaded Woodpecker (RCW) habitat improvement, control of understory species, site preparation, or to encourage the establishment of native grasses.

The project will occur primarily on upland pine and pine-hardwood forests in Management Area 1 (MA-1) Upland Forest Ecosystems and Management Area 2 (MA-2) Red-cockaded Woodpecker (RCW) Emphasis. Areas within Management Area 4 (MA-4) Streamside Management Zones that lie adjacent to upland sites are included within the prescribe burn areas where they cannot be excluded without the construction of ground-disturbing firelines.

The prescribe burning will aid in meeting the desired future conditions of the areas as described in the 1996 Revised Land and Resource Management Plan for the National Forests and Grasslands in Texas (the *Plan*). The *Plan's* desired future conditions for MA-1 and MA-2 on the Davy Crockett National Forest include landscapes of open pine forests mixed with some hardwoods with little to no hardwood components harmonize with an herbaceous understory. Desired future conditions within MA-4 vary widely across the forest, ranging from open mixed pine-hardwood forest along minor streams to hardwood-dominated forest along major perennial streams with broad floodplains.

In the RCW Habitat Management Areas (HMAs) that comprise MA-2, the primary objective of burning is to create an open, park-like view with little to no hardwood components and a herbaceous understory. Prescribe burning in MA-2 would also benefit Eastern wild turkey as well as other ground-nesting species habitat by reducing fuel accumulations that may lead to catastrophic wildfires. In MA-1, the primary objectives are to reduce the accumulation of fuels that may lead to catastrophic wildfires, maintain or enhance the habitat for ground nesting birds,

and to create suitable habitat for the reintroduction of the Eastern wild turkey. Prescribed fire will preserve the diversity of the transition zones between upland management areas (MA-1 and MA-2) and MA-4 without adversely affecting the moister hardwood-dominated areas.

A portion of the project area lies within the boundaries of the Alabama Creek Wildlife Management Area, which has been managed jointly with Texas Parks and Wildlife Department (TPWD) since 1981, to provide adequate wildlife resources for public enjoyment such as white-tailed deer and Eastern wild turkey.

Other areas included in this proposal are: the Neches River Corridor (MA 8b – Protected River and Stream Corridors) in Compartments 20, 26, 119, 120, and 121; Texas Natural Heritage Areas in Compartments 7 and 20 (MA-8d – Natural Heritage Areas); Ratcliff Lake Recreation Area (MA-9a – Developed Recreation Sites); and Neches Bluff and Piney Creek Horse Camps (MA-9b - Minimally Developed Recreation Sites). According to the *Plan*, prescribed fire may be used in these areas to maintain or enhance desired conditions, botanical character, visual quality, or recreation experience.

Fire Regime Condition Class is a measure of the amount of departure from the natural fire regime. The desired condition, Condition Class 1, is considered a low departure from natural conditions where vegetation characteristics, fuel composition, and fire behavior is within the historical range of variability and there is a low risk to key ecosystem components (Schmidt et al. 2002). Many of the areas included in this project are categorized as Condition Class 2 or 3, where vegetation structure, fuel levels, and fire severity are outside the normal range and there are moderate to high risks of losing key ecosystem components.

Table 1. Proposed burn compartments and acreage

Compartment	Acre	Compartment	Acre
1	1615	56	1734
2	727	57	1946
3	1289	58	1215
5	1328	59	588
6	1076	60	764
7	1207	62	2078
11	500	64	1561
12	845	65	1292
13	1302	66	1354
14	2261	67	1441
15	1598	68	1877
16	1275	69	1301
17	1249	70	1329
18	1096	71	914
19	1561	72	1824
20	1053	73	1785

26	929	76	1003
27	835	78	2027
28	773	79	1307
29	1726	94	2406
30	1731	95	505
32	2072	100	1172
34	1440	101	1678
35	1340	104	896
36	810	105	1075
37	1055	106	479
39	2173	110	1466
40	1929	112	1598
41	1977	113	1700
42	970	114	2006
43	1848	115	1443
46	729	116	2201
47	1351	117	792
48	975	118	1284
49	1515	119	900
50	1562	120	1249
54	2434	121	2046
55	1732		

Compartments 22 (1144) and 33 (1407 ac) will be considered in this analysis. Compartment was added to the proposed action after scoping comments from US Fish and Wildlife Service.

### **Proposed Action**

**The action proposed by the Forest Service to meet the purpose and need include:**

- **Prescribe burning of approximately 106,000 acres on a 1-5 year cycle**
- **Clearing control lines along private property boundaries**
- **Utilize existing roads and/or streams where possible to serve as control line**

### **Methodology Used to Collect Data and Make Scientific Findings**

**The analysis for the wildlife species found in the project and analyzed for effects is using the best available science. The literature, survey data, documents utilized best represents the species within the project area.**

**The process for conducting biological evaluations and assessments is outlined in Forest Service Manual 2672.43. This process consists of a pre-field review, field reconnaissance and surveys, and analysis of potential impacts.**

**The pre-field review includes reviewing records and maps to determine if listed species or their habitat may be present. The wildlife biologist was involved in the project planning to facilitate mitigation measures in sensitive habitat areas.**

**At the next level, habitat may be present, but no activities are planned for any of that habitat, thus the project will have no impact on that habitat and no further analysis is needed.**

## Desired Conditions

The prescribed burning will aid in meeting the desired future conditions of the areas as described in the 1996 Revised Land and Resource Management Plan for the National Forests and Grasslands in Texas (the *Plan*). The *Plan's* desired future conditions for MA-1 and MA-2 on the Davy Crockett National Forest include landscapes of open pine forests mixed with some hardwoods with little to no hardwood components harmonize with an herbaceous understory. Desired future conditions within MA-4 vary widely across the forest, ranging from open mixed pine-hardwood forest along minor streams to hardwood-dominated forest along major perennial streams with broad floodplains.

In the RCW Habitat Management Areas (HMAs) that comprise MA-2, the primary objective of burning is to create an open, park-like view with little to no hardwood components and a herbaceous understory.

## Species Considered & Species Evaluated

**A.** Federally listed species which appear on the U.S. Fish and Wildlife Service (USFWS) county list. ***Federally Listed Threatened or Endangered Species*** are determined by USFWS that these species are threatened or endangered and are protected under the Endangered Species Act (ESA).

**B.** Sensitive species associated with the Davy Crockett NF are listed on the Regional Forester's (R8) updated September 2010. ***Sensitive Species*** are identified by the Regional Forester of concern for population viability is a concern (FSM 2670.5).

Species or their habitat(s) that may be affected by the proposed actions are evaluated in this BE.

## Evaluated Species Survey Information

When adequate population inventory information is unavailable, it must be collected when area of interest has high potential for occupancy.

The available inventory information is adequate because inventories of high potential habitat within the proposed treatment areas are current enough to guide project, support determination of effects, and meet requirements for conservation of these species.

## Effects of Proposed Action(s)

An analysis of *direct*, *indirect*, and *cumulative* effects of the listed alternatives in this document on the selected species are described in these sections:

*Direct* effects are those actions resulting from the proposed actions that directly impact TES species.

*Indirect* effects are those actions stemming from the proposed actions that may impact TES species

and/or its habitat that occur outside the treatment areas. *Cumulative* effects are the sum of all (federal and private) actions that may impact TES species and its habitats.

1. The *treatment area* is the area(s) on which management actions would take place.
2. The *analysis area* is the compartment(s) or unit(s) included in the project.

The evaluation is based upon:

1. Review of the literature - see “Literature Cited” at the end of this document.
2. Review of the following documents:
  - Red-cockaded Woodpecker Recovery Plan, second revision (U.S. Fish and Wildlife Service, 2003)
  - Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region (USDA Forest Service, Southern Region, 1995)
  - Revised Land and Resource Management Plan (USDA Forest Service, NFGT, 1996)
3. Review of Davy Crockett National Forest TES species GIS
4. This Biological Evaluation is based upon the best available science, including peer-reviewed scientific literature, state and federal agency reports and management input, discussions with scientists and other professionals, and ground-based observations.

**Affected Environment**

***Threatened, Endangered, Proposed, and Candidate***

The Fish and Wildlife Service lists

Habitat descriptions for this species can be found in the Forest Plan.

**Table 2 T&E species within the project area**

Species	Status	Habitat Present in treatment area	Comments
Red-cockaded Woodpecker ( <i>Picoides borealis</i> )	E	Yes	This species has a high potential to occur within the project area.

The red-cockaded woodpecker (RCW) has a high potential to occur on drier ridge tops in open-canopy, fire-maintained, mature pine stands with forb and/or grass dominated ground cover and a mid-story relatively devoid of hardwoods (Hovis and Labisky 1985; Jackson 1994; Conner et al. 2001; Walters et al. 2002; USFWS 2003). The species has moderate potential to occur in mature, pine-dominated stands with a mixture of hardwoods and hardwood mid-story, as is present throughout much of the National Forests in Texas (NFT). The RCW excavates cavities in live pine trees, using older trees infected with red heart fungus (*Phellinus pini*), thin sapwood and a large diameter of heartwood (Conner et al. 1994;

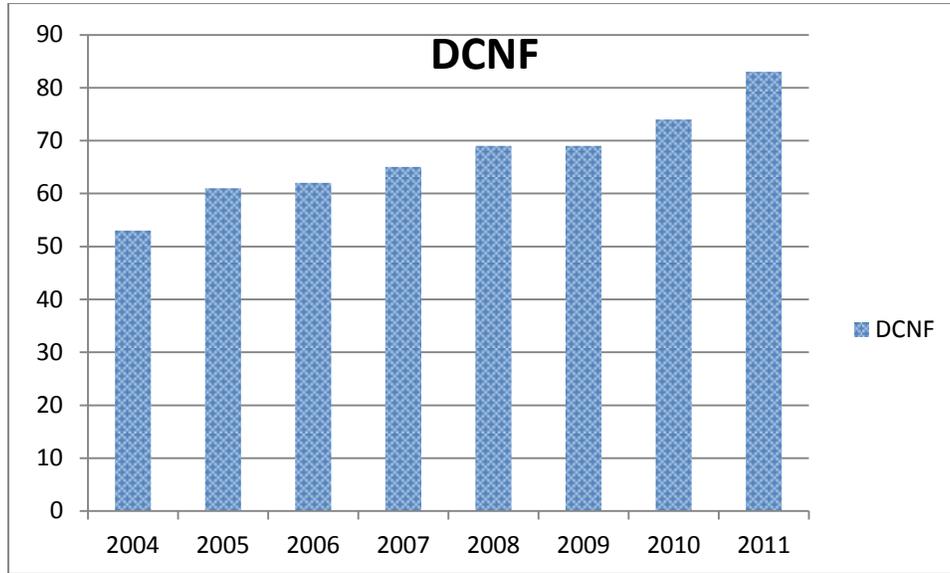
Conner et al. 2001). Generally, pines  $\geq 60$  years old are needed for cavity excavation (Rudolph and Conner 1991; USFWS 2003). Threats to this species include conversion of mature forest to short-rotation plantations or non-forested areas, hardwood proliferation resulting from fire exclusion, lack of forest management to develop and maintain open stand conditions, and habitat fragmentation that affects population demographics.

Some of the pine dominated stands in the project area are composed of trees that are of suitable age ( $\geq 60$  yrs.) for cavity excavation (Rudolph and Conner 1991, p.458-467; USFWS 2003, p.34). However, these stands have a high pine density and/or a well-developed hardwood mid-story, and are unsuitable as nesting or foraging habitat for this species (USFWS 2003).

The DCNF reported in August of 2012 having 83 active RCW clusters, 77 potential breeding groups (PBGs), 13 recruitment clusters (RCs), and 23 inactive clusters which 13 of those are extensively monitored annually. Seventy-seven PBG's, 13 RCs and 20 inactive clusters are encompassed in the proposed treatment areas. Red-cockaded woodpecker clusters have been comprehensively inventoried and tabulated in a consistent manner since 1990 and all current monitoring techniques allow personnel to report data consistently.

The results depicted in the following figure indicate a steady increase (Figure 1) in the number of RCW active clusters known to occur on the DCNF. The increase from 53 PBG's in 2004 to 77 PBG's in 2011 represents 69% increase in the number of active clusters known to occur on the DCNF.

**Figure1. Number of RCW Clusters from 2004 thru 2011**



Since 2004, 66,248 acres of primarily pine-dominated communities in RCW Habitat Management Areas have been treated with prescribed burns.

**Table 3. RCW Habitat Management Area Prescribed Fire Effort 2004 - 2011.**

<i>HMA</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
	<i>Burned</i>	<i>Burned</i>	<i>Burned</i>	<i>Burned 07</i>	<i>Burned 08</i>	<i>Burned 09</i>	<i>Burned 10</i>	<i>Burned</i>	<i>Burned</i>
	<i>04</i>	<i>05</i>	<i>06</i>					<i>11</i>	
<i>Forest</i>	<i>Acres</i>								
D. Crockett	66,248	13,350 (20%)	11,110 (17%)	18,211 (27%)	31,000 (47%)	40,500 (61%)	17,529 (26%)	24,591 (37%)	19,545 (30%)

**R8 Sensitive Species**

Some R8 sensitive species may not currently occur within the project area; however the proposed actions may improve the current habitat to a more favorable condition in the future. These species will be carried forward in the analysis. Those species with specialized habitats not found in the project area or not expected to be affected by the proposed actions will not be carried forward in the analysis

**Table 4. Analysis determination for further analysis**

Species	Potential Habitat Present or effected by Project	Determination
Bald Eagle <i>(Haliaeetus leucocephalus)</i>	Yes	No high potential habitat for this species will be significantly affected by the proposed action.
Bachmans’s Sparrow <i>(Aimophila aestivalis)</i>	Yes	Species will be analyzed because it is expected to potentially respond to the proposed actions.
Migrant Loggerhead Shrike	Yes	No high potential habitat for this species will be affected from the proposed action. Habitat for this species is more prevalent to pasture fields on private lands. Will not be carried forward in this analysis.
Rafinesque’s Big-eared Bat <i>(Corynorhinus rafinesquii)</i>	Yes	Although high potential roosting habitat exists in bottomland hardwoods this species will be analyzed. Temporary roost sites (snags) and foraging habitat in upland areas may be affected by proposed actions.
Southeastern Myotis <i>(Myotis austroriparius)</i>	Yes	High potential habitat for this species occurs in bottomland hardwood. Although this habitat is not proposed for treatment roosting and foraging habitat along ponds and streams may be affected.

**Rafinesque's Big-eared Bat and Southeastern Myotis**

These bats reach the western limit of their range in eastern Texas. The Rafinesque's Big-eared bat and the Southeastern Myotis bat roost in hollow trees, buildings, behind loose bark on dead trees, crevices, and under bridges. Roosting habitat for the Rafinesque's Big-eared Bat and Southeastern Myotis occurs within mature bottomland hardwood communities containing large diameter, hollow hardwoods, often in close proximity of water. Rafinesque's will forage over young plantations, a dense understory, and in mature forested uplands and bottomlands. Southeastern Myotis generally forage in areas with or near water.

The Rafinesque's Big-eared bat and the Southeastern Myotis display a bimodal pattern of foraging activity, common to a number of bat species; that is, they forage for several hours soon after dark, and again for a few hours in the morning before returning to their day roosts before dawn (Menzel et al. 2001). Between foraging bouts, they likely rest in temporary night roosts in or near their foraging areas. Bats may use a variety of sites for these temporary roosts, depending upon what is available. The big-eared bat, which occasionally forages in upland areas or non-hardwood stands adjacent to high potential bottomland foraging areas, may use snags with loose bark or cavities, or upland hardwoods with cavities, as temporary roost sites. Contrary, the Southeastern Myotis spends most of its foraging in areas low, close to the water surface. These species are experiencing a population decline across their ranges.

Habitat for these species occurs with the proposed project area, however roosting habitat found in the hardwood bottomland areas is not proposed for treatment. Incidental fire through these areas is not expected to burn with enough intensity to negatively affect the potential roosting habitat or directly affect the species.

### ***Bachman's Sparrow***

The Bachman Sparrow has been documented mostly in the eastern counties of the State of Texas. The Bachman's Sparrow is a permanent resident of the State inhabiting areas of high density herbaceous cover and a low density of mid and overstory. The pineywoods portion of the southeastern U.S. with its historically vast, mature, open pine forest and savannahs maintained by frequent fires, was where this species once thrived (Jackson 1988). Due to the decline of this particular habitat type Bachman's now may use grassy areas, abandoned fields, or regenerating clearcuts. The status of this species is declining throughout its range (Arnold 2012) especially in Texas where populations are fragmented and disjunct. Timber management and fire suppression have affected the native grasses which are important to this species.

Habitat for the Bachman’s sparrow can be found in the treatment area in natural opening or in stands with a diverse understory consisting of grasses, forbs, and some woody species. In stands where this diversity is lacking Bachman’s sparrow would not be expected to occur. Tucker et al (2004) suggested that optimal Bachman’s sparrows could be found in longleaf pine forest maintained by burning on a 2 or 3 year rotation. And densities of Bachman’s sparrows declined with burning rotations greater than 3 years.

***Terrestrial Management Indicator Species***

**Table 5. Analysis determination for further analysis**

Management Indicator	Management Indicator For:	Selected for Project		Rationale
		YES	NO	
Red-cockaded Woodpecker	Longleaf Pine Woodland/Savanna Dry-Xeric Oak-Pine Forest Mesic Oak-Pine Forest	X		Species effects and analysis addressed in Threatened and Endangered species section.
Eastern Wild Turkey <i>(Meleagris gallopavo)</i>	Forest/Grassland: Early Succession (0-20 yrs) Mid-Succession (20-50 yrs) Late Succession (50-90 yrs) Old Growth (90+ yrs)	X		Species responds to forest management actions. Turkey will benefit from the reduction in density of understory and mid-story components in the proposed action. Effects for this species would be similar to the RCW.

***Eastern Wild Turkey***

Eastern turkeys in Texas are associated with open, mature hardwood and mixed forests. Turkeys also require mature trees and a variety of shrubs that provide security cover and roosting sites. Eastern wild turkey generally nest on the ground in hardwood or mixed-forested stand, at base of sizable trees within dense understory, under brush or slash pile, in thickets of greenbriar or downed trees and branches (NRCS 1999). Foraging requirements for turkeys varies depending on the season. Spring and summer forage includes green grasses, weeds, flower buds, seeds and insects while fall and winter forage consists of fruits, mast and green forage such as oats, wheat, and clover. Forest-nesting turkeys

commonly nest in close proximity to openings and edges where poults have access to insect foods shortly after hatching.

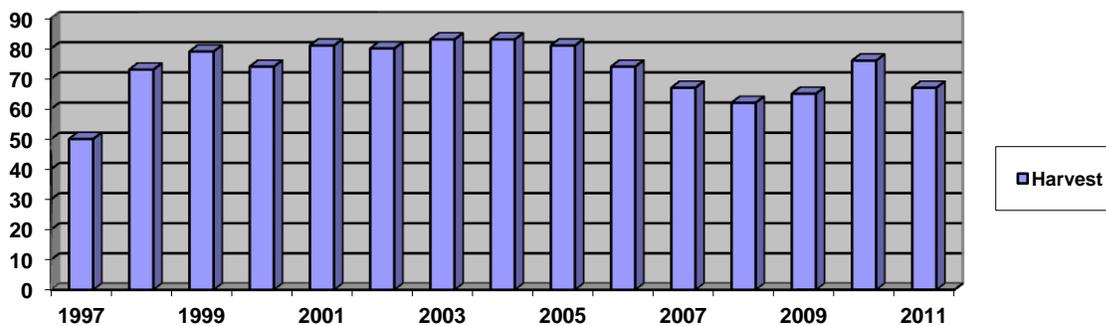
Annual surveys and harvest data (Table 4) found in the National Forest and Grasslands Monitoring and Evaluation Report suggest that Eastern wild turkey populations are stable and that viability is not an issue on NFGT. However when evaluated by individual counties, wild turkey population numbers are low in some areas (Table 5). Houston and Trinity Counties which are within the proposed treatment area report only show 4 reported harvests in 4 years all in Trinity County. The 2012 spring turkey hunting season in Houston County was closed due to the number of reported harvests in recent years.

The use of prescribed fire to manage turkey habitat has been a topic of discussion amongst biologist. Some biologists feel that prescribed fire use during the spring season has a greater impact on turkey recruitment and therefore negatively affects the population growth. Other biologists feel that of all the necessary habitat requirements for turkey survival the most important is the brood rearing habitat utilized by poults. Poults will forage and survive mostly on insects at an early age and therefore benefit from the diversity commonly found when grass and forbs occur in the understory. Adult turkeys generally can occur in habitat with less of this component because of their ability to utilize alternative food sources such as seeds, buds, and hardwood mast.

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**Table 6. Spring Turkey Harvest in Angelina, Houston, Jasper, Nacogdoches, Newton, Sabine, San Augustine, Shelby, San Jacinto, Trinity, Montgomery and Walker Counties (National Forest Counties) from 1997-2011.**

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**Table 7. Spring Turkey Harvest by County (National Forest Counties) 2008-2011.**

	2008	2009	2010	2011
Angelina	7	9	9	3
Houston	0	0	0	0
Jasper	18	16	12	12
Nacagdoches	7	6	9	10
Newton	13	15	25	22
Sabine	11	8	14	14
San Augustine	5	8	6	3
Shelby	0	1	1	1
San Jacinto	0	0	0	1
Trinity	1	2	0	1
Montgomery	0	0	0	0
Walker	0	0	0	0
Total	62	65	76	67

The low numbers of harvested turkeys within Houston and Trinity Counties may be directly attributed to the lack of available brood and rearing habitat found in the treatment area. Some habitat areas in the treatment areas that have had a regular frequency (2-3 yrs) of prescribed fire use have maintained an understory with grasses and forbs present. However, a majority of the habitat found within treatment area is dominated with woody species in the understory and a mid-story (pines and hardwood) component. To successfully increase the herbaceous ground cover fire frequency would also have to increase. Recent local studies used to develop a Habitat Suitability Index for turkeys suggests that openings and a herbaceous ground cover were the key factors in determining high quality turkey habitat.

### **Environmental Consequences**

***-Effects on Threatened, Endangered, and Sensitive Species, and Management Indicator Species*****Threatened, Endangered, Proposed, and Candidate*****Alternative I (No Action)****Direct and Indirect Effects*

There are no expected direct effects on the Red-cockaded Woodpecker (RCW) from the *No Action Alternative*. With no proposed action the probability of direct effects from prescribed burning on the species or its cavity habit does not exist.

There will be a negative indirect effect from the *No Action Alternative* within the RCW foraging and cavity habitat found in the project area. The lack of fire would increase the amount of woody understory species and an undesired mid-story (pine and hardwood) component within potential foraging and cluster habitat. A well-developed woody understory would eliminate any potential of grasses or forbs from establishing due to the competition. Because the desired condition does include conservative native grasses, which inherently take time to establish the lack of fire would not allow for conditions where un-occupied ground sites would be available for occupation by these grasses. The lack of fire would also allow for dense duff layers to establish and suppress the growth of forbs and other desired herbaceous species. The lack of the grasses and forbs directly affects the quality of forage (insects) for the RCW. The absence of fire also directly affects the density of the mid-story component which has two effects on the RCW habitat. The first effect is on the desired understory condition of grasses and forbs. A dense mid-story reduces the amount of light reaching the forest floor which directly effects the growth of grasses and forbs. Also, directly affected by a dense mid-story is the available foraging substrate for RCW. Dense mid-story does not allow the RCW to utilize all portions of the tree which could be foraged upon. This directly affects the amount of time the RCW spends foraging for food during the day.

The lack of fire does affect an RCW's cavity habitat in established clusters and in future cavity excavation sites. Where cavities exist in active clusters the dense mid-story can increase predator and cavity competitor interaction. A dense mid-story also prevents future cavity excavation due to an RCW's reluctance to create a cavity where mid-story densities crowd out the boles of potential (red heart fungus) cavity trees. This will indirectly effect the growth of the RCW in the project area.

### *Cumulative Effects*

Most of the compartments with the treatment area are being managed or proposed to be managed for the recovery of RCW. Management or silvicultural prescriptions follow the guidelines for Good Quality Foraging Habitat in the RCW Recovery Plan. These future actions of pine thinning and mid-story management will benefit the RCW population in the treatment area. However without the use of prescribed fire to control regeneration density RCW habitat quality will decrease.

Private land surrounding the Forest is oriented towards wood production generally with a scheduled harvest rotation of 20-40 years. Most pine stands will never reach an age to be available for RCW expansion off Forest Service managed lands. Temporarily these lands may provide some foraging opportunities for RCW, but they are not expected to provide habitat for cavity excavation.

### ***Alternative II (Proposed Action)***

#### *Direct and Indirect Effects*

Prescribed burning the compartments that have active RCW clusters will have an effect on the species and cavity habitat. RCW generally will vacate the cavity after sunrise and begin foraging within their defended territory. The RCW may return to their cluster midday to work on cavity trees and then returning to their foraging habitat before coming back to their cavities to roost for the night. Prescribed burn operations generally begin mid-morning and have a completion time of mid-afternoon. This reduces the interaction of the RCW and the prescribed burn moving through the cluster. Prescribed burning and RCW interaction does increase during mid-April when the birds generally lay their eggs and begin incubation. During this time RCW may be displaced to areas outside of the prescribed burn.

The effect on cavity trees directly is minimized by following the guidelines (raking, mowing, etc) in the 2003 RCW Recovery Plan. Most clusters have had the mid-story component treated mechanically and the guidelines are adequate in protecting the cavity trees during implementation of prescribed fire. In the unexpected loss of an active cavity tree the biologist will assess the cluster to determine if there are an adequate number of cavities available for the RCW group. If the number of cavities is insufficient the biologist will request additional artificial cavities be installed.

Prescribed fire at a 1-5 year cycle will have a beneficial effect on the foraging and cavity habitat for RCW in the project area. The fire frequency and intensity will directly affect the ability to achieve the desired condition in the project area. Current conditions in the project area have an established woody understory and a well-developed mid-story of pine and hardwood. Prescribed burning would decrease the amount of woody understory/midstory species and increase available sites for grasses and forbs to establish. Increased frequency of prescribed fire will maintain the open sites for a longer period of time which benefits grass and forbs establishment. Prescribed burning also will help reduce smaller diameter mid-story species and control the level of mid-story in larger diameter pines and hardwoods. Increasing the frequency of prescribed burning will help reduce some larger diameter mid-story species which will in turn aid in the increase of sunlight reaching the forest floor. This would benefit the desired condition of restoring grasses and forbs to the understory. The increase in diversity of the herbaceous (grasses and forbs) species will directly affect the quality/quantity of forage available to the RCW.

Prescribed fire indirectly affects RCW cavity habitat by increasing the quality of the foraging habitat. By increasing the quality of foraging habitat the RCW can spend less time searching for insects and more time excavating cavities within the territory. These excavated cavities may become part of the existing cluster or have the potential to become a separate “pioneer” cluster established by RCW’s in the helper class. Indirectly the increase in quality habitat directly effects the growth of the RCW population as a whole.

Fire line construction along private property boundaries would have an insignificant and discountable effect on the RCW or its foraging or cavity habitat. There are 11 active clusters that have their “delineated” cluster boundary occurring near private property boundaries. Although the delineated cluster boundary may occur on the property line an actual RCW cavity may not. The construction and clearing of the private property line is necessary for the protection of the private land outside of the project area. The RCW Recovery Plan under 8F: Cluster Management guidelines (a) “avoid construction of new roads and trails within clusters. However this is a necessary action to protect private land and the Forest Service will divert to the guidelines (c) for protecting individual cavity tree roots if any cavity trees occur along the fire line construction. Indirect effects from the construction of fire line along private property will benefit RCW foraging and cavity habitat. See indirect effects for prescribed burning on a 1-5 year cycle.

### *Cumulative Effects*

Most of the compartments within the treatment area are being managed or proposed to be managed for the recovery of RCW. Management or silvicultural prescriptions are implemented following the

guidelines for Good Quality Foraging Habitat in the RCW Recovery Plan. These future actions of pine thinning and mid-story management will benefit the RCW population in the treatment area. Along with the proposed action of utilizing prescribed fire to maintain or enhance the understory vegetation the population for RCW can be expected to grow.

Private land surrounding the Forest is oriented towards wood production generally with a scheduled harvest rotation of 20-40 years. Most pine stands will never reach an age to be available for RCW expansion off Forest Service managed lands. Temporarily these lands may provide some foraging opportunities for RCW but they are not expected to provide cavity habitat.

It is my determination that the proposed action “May Affect but is Not Likely to Adversely Affect” the Red-cockaded Woodpecker.

#### R8 Sensitive Species

##### ***Alternative I (No Action)***

##### *Direct and Indirect Effects*

Because no management activities would occur in the proposed treatment areas under this alternative, there would be no *direct* effects on the Rafinesque’s Big-Eared bat or the Southern Myotis’ potential roosting sites.

There could potential be an *indirect* effect on the creation of roosting sites and habitat along with the quality of forage (insects) in the absence of fire. Prescribed burning benefits to bats in the Southeast and Mid-Atlantic are attributed to forest habitat modification that alter or increase amounts and quality

of roosting habitat, modify or improve foraging habitat and increase arthropod prey abundance (Carter et al).

### ***Alternative II (Proposed Action)***

#### *Direct and Indirect Effects*

The Rafinesque's Big-Eared bat and Southeastern Myotis could be disturbed or displaced from roosting sites during implementation of prescribed burning. Snags serving as bat roosts could be consumed by burning and during intense fires, roosting bats could be killed (Carter et al). This concern would be more prevalent towards potential roosting sites in upland pine and pine/hardwood stands where understory vegetation may influence flame heights and intensity and potentially affecting roost trees. Flame intensity and height are controlled by vegetation and site characteristics associated with bottomlands.

Winter or "dormant" season burning may impact both species of bats because temperatures in the south generally remain warmer and ensure year round presence of bats. Concerns for bat safety increases if burns occur after a short period of cold weather, which may induce a temporary state of torpor and bats are not able to readily take flight during a prescribed burn. Many bat species in the Southeast presumably have evolved in fire dominated ecosystems with roosting strategies that limit their vulnerability to fire. Moreover, fire in any season that causes overstory tree mortality and creates snags suitable as bat roosts probably provide far more benefit to bats than do the negative impacts from burning (Carter et al).

Members of the cavity and bark roosting species rely on hollow trees or snags with cavities which can be affected by prescribed burning. Snags are naturally occurring on the landscape due to wind damage, lightning, insects, and fire. Higher intensity prescribed fire can potentially increase the number of snags available for future roost sites. However these snags may not remain on the landscape as long as a naturally occurring snag. Higher intensity fires may also decrease the density of stand and increase the amount of radiant heat. This radiant heat could potential increase available roosting sites in upland pine and pine/hardwood stands. Lower intensity fires can create snags over a longer period of time as they increase the impacts to healthy trees and create vulnerability for disease and fungi that form hollow cavities. Periodic prescribed burning may help to reduce the number of woody shrubs, understory trees, and midstory trees in the short term and longer term applications of prescribed fire may reduce the overall density and complexity of the stand. Burned areas may have lower tree densities, less structural clutter, more open canopy, and greater numbers of snags, which may provide favorable roosting areas for many species (Perry 2011).

Fireline construction with equipment would not be expected to impact the Rafinesque's big-Eared bat or Southeastern Myotis directly. However, dead snags along the fireline may increase the potential for prescribed fires to burn outside of the objective area. These snags may have to be cut and removed to ensure the prescribed burn objective can be met. The removal of these snags would not have a significant effect on the overall number of available snags across the landscape.

### *Cumulative Effects*

Compartments within and outside of the treatment area are managed for either RCW recovery or wood production management. RCW and wood production management prescriptions would continue to provide foraging and roosting habitat for these species of bats on the landscape. Management would focus on growing larger diameter pines on uplands with a mixture of hardwood trees and continue to maintain hardwood dominated bottomlands along creeks and streams. Along with prescribed fire temporary roosting sites in upland pine habitat would continue to be created and higher potential roosting sites found in the hardwood wood bottoms would not be affected due to the associated understory vegetation.

On private lands surrounding the treatment area roosting habitat may be absent due to harvesting within bottomland hardwood systems. Potential roosting sites may no longer exist within privately managed timber land. Forest management on private lands would not provide opportunities for permanent or temporary roosting in upland pines. Timber is generally on a 20-40 year harvest schedule. Management protocol on private land is not expected to change in the future.

### ***Alternative I (No Action)***

#### *Direct and Indirect Effects*

Because no management activities would occur in the proposed treatment areas under this alternative, there would be no *direct* effects on the Bachman's Sparrow.

Indirect effects from the *No Action* on this species would be the loss of suitable habitat, Bachman's Sparrow nest and forage on the ground and require a dense herbaceous layer. In the absence of fire woody species would begin to dominate the understory component and eliminate grasses and forbs from the system.

***Alternative II (Proposed Action)****Direct and Indirect Effects*

Bachman's sparrow like many ground nesting birds in the southeast have evolved with fire. Generally fires occurred during the spring and summer when storms were likely to occur. Growing season burns could potentially affect the reproduction efforts of Bachman's either in the nesting or late fledgling stages. Adult Bachman's sparrows would be temporarily displaced to areas outside of the prescribed burn.

Where Bachman's sparrow habitat exists within the treatment area the use of prescribed fire would be expected to maintain the diversity in the understory component and maintain the habitat for Bachman's sparrows. In areas where woody species dominate the understory and the mid-story component density is high prescribed fire may help to improve the habitat for Bachman's sparrows. Increased fire frequency in these areas may provide open sites for grasses and forbs to eventually occupy. Frequent fires will also keep the regeneration of woody species at levels that are tolerable for Bachman's sparrows. Bachman's sparrows use areas of low tree and shrub densities, short woody vegetation and a high density of grasses and forbs in their home range. Prescribed burning on a 1-5 year cycle may help to maintain these characteristics however Tucker et al (2004) suggested that the density of Bachman's sparrows began to rapidly decline 3 years after burning.

The construction of fire lines along private property boundaries are not expected to have and direct or indirect effects for the Bachman's sparrow.

*Cumulative Effects*

In other compartments within and outside of the treatment areas management of RCW and timber management would benefit Bachman's sparrows. The management prescriptions associated with the Good Quality Foraging Habitat requirements in the RCW Recovery Plan would create habitat beneficial for Bachman's sparrows. In wood production management areas prescriptions for pine thinning would provide habitat requirements longer while regenerating cuts would provide habitat for 4-7 years.

Private land surrounding the Forest is oriented towards wood production generally with a scheduled harvest rotation of 20-40 years. Thinned pines and regenerating clearcuts would likely provide limited habitat for Bachman's sparrow.

It is my determination that the proposed action "*May impact individuals but is not likely to cause a trend toward federal listing or loss of viability*" for the Rafinesque's Big-eared Bat, Southeastern Myotis, or Bachman's Sparrow.

#### Management Indicator Species

##### ***Alternative I (No Action)***

##### *Direct and Indirect Effects*

Because no management activities would occur in the proposed treatment areas under this alternative, there would be no *direct* effects on the Eastern Wild Turkey. Indirect effects from the No Action alternative would affect habitat for the turkey in the treatment area. Some habitat requirements (roosting, foraging, and nesting) would continue to exist on the landscape however it can be expected grasses and forbs would be absent for the understory component. This would affect the available foraging opportunities for poults.

***Alternative II (Proposed Action)****Direct and Indirect Effects*

Under the Proposed Action alternative there are concerns with affecting nesting turkeys, frequency and size of burns. Although affecting nesting is a concern most prescribed fires do not consume all habitat acres within the treated area. Bottomland hardwoods habitat which provides corridor travel and foraging opportunities generally does not burn because of the associated vegetation. These areas would continue to provide habitat for the turkeys with potential nest sites during spring burns. Turkeys are generally known to re-nest if the initial nest is destroyed or predated. While it is an unfortunate reality that fires may burn one or two turkey nests, when you factor in all the hens and nests across the area, fire poses a risk to a very small percentage of the overall turkey population. Considering its long-term benefits to turkey brood habitat and poult survival, controlled burns have an overall positive effect on wild turkey populations (Koloski).

Prescribed fire at a 1-5 year cycle could possibly maintain an herbaceous understory in areas where the grasses and forbs make up a majority of the understory species. In other areas within the treatment area the fire frequency and intensity will directly affect the ability to achieve the desired condition in the project area. Current conditions in the project area have an established woody understory and a well-developed mid-story of pine and hardwood. Prescribed burning would decrease the amount of woody understory species and increase available sites for grasses and forbs to establish. Increased frequency of prescribed fire will maintain the open sites for a longer period of time which benefits grass and forbs establishment. Prescribed burning also will help reduce smaller diameter mid-story species and control the level of mid-story in larger diameter pines and hardwoods. Increasing the frequency of prescribed burning will help reduce some larger diameter mid-story species which will in turn aid in the increase of sunlight reaching the forest floor. This would benefit the desired condition of restoring grasses and forbs to the understory. The turkey's need for a relatively open forest understory has already been emphasized. The proper use of fire to maintain this open aspect is an important management practice in pine types. In addition to maintaining an open understory, prescribed burns enhance the availability of some desirable food sources. Wild turkeys eagerly consume the new tender growth of forbs, grasses and legumes stimulated by the burn. Insects are often abundant on recently burned areas, as they are attracted to the newly abundant flowering legumes. Hens and poults make excellent use of such areas for insect and plant materials (Yarrow 2009).

The size of the prescribed burns is determined more by the managed unit than by geographic features on the landscape. Concerns have been raised because two or three adjoining units may be burned in the same year and habitat may not be available for turkeys in the short term. As discussed early prescribed fires generally do not consume every acre within the managed unit, due to the use of a

helicopter on most prescribed burns, a mosaic burn pattern occurs. Bottomland hardwood habitat typically does not burn due to the associated vegetation and when fire does occur in the area it is generally of low intensity.

Fire line construction along private property boundaries would have no effect on turkeys. Most fire line construction occurs during the fall and early winter months when turkeys are mobile.

### *Cumulative Effects*

Most of the compartments within the treatment area are being managed or proposed to be managed for the recovery of RCW. Management or silvicultural prescriptions are implemented following the guidelines for Good Quality Foraging Habitat in the RCW Recovery Plan. These future actions of pine thinning and mid-story management will benefit the turkey as they will potentially increase the amount of herbaceous species in the understory. Along with the proposed action of utilizing prescribed fire to maintain or enhance the understory vegetation the habitat for turkeys is likely to increase.

Private land surrounding the Forest is oriented towards wood production generally with a scheduled harvest rotation of 20-40 years. In regeneration areas some potential nesting habitat may exist in the short term.

Literature Cited

Arnold, Keith A. November 15, 2012. <http://txtbba.tamu.edu/species-accounts/bachmans-sparrow>.

Carter, Timothy. C, W. Mark Ford and Michael A. Menzel. 2000. Fire and Bats in the Southeast and Mid-Atlantic: More Questions Than Answers? The Role of Fire in Nongame Wildlife Management and Community Restoration: Traditional Uses and New Directions. Proceedings of a Special Workshop. Nashville, Tennessee September 15, 2000. TTR-NE-288. P. 139.

Conner, R. N., D. C. Rudolph, D. Saenz, and

R. R. Schaefer. 1994. Heartwood, sapwood, and fungal decay associated with red-cockaded woodpecker cavity trees. J. of Wildl. Manage. 58:728-734.

\_\_\_\_\_, \_\_\_\_\_, and J. R. Walters.

2001. The Red-cockaded Woodpecker, Surviving in a fire-maintained ecosystem. University of Texas Press. Austin, TX. 363 p.

Koloski, Joe; Mississippi and Alabama Regional Biologist. November 27, 2012 website visited. <http://www.nwtf.org> Turkey Myths Debunked.

Menzel, M. A., J. M. Menzel, W.M. Ford, J. W. Edwards, T. C. Carter, J. B. Churchill, and J. C. Kilgo. 2001. Home range and habitat use of male Rafinesque's big-eared bats (*Corynorhinus rafinesquii*). Am. Midl. Nat. 145:402-408.

Perry, Roger W. 2011. A Review of Fire Effects on Bats and Bat Habitat In The Easter Oak Region. Proceedings of the 4<sup>th</sup> Fire in Eastern Oak Forest Conference. Springfield, MO, May 17-19, 2011. GTR-NRS-P-102. P. 170.

Tucker, James W. W Douglas Robinson, and James B Grand. 2004. Influence Of Fire On Bachman's Sparrow, An Endemic North American Songbird. Journal of Wildlife Management. 68(4):1114-1123.

USDA Forest Service (USFS). 1996. Revised Land and Resource Management Plan,

National Forests and Grasslands in Texas.

USDA Natural Resource Conservation Service November 1999. Wild Turkey. Fish and Wildlife Habitat Management Leaflet. Number 12.

U.S. Fish and Wildlife Service (USFWS). 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): Second revision. U.S. Fish and Wildlife Service. Atlanta, GA. p 34.

Yarrow, Greg. Clemson Cooperative Extension. Estension Forestry and Natural Resources. Biology and Management of Eastern Wild Turkey. Fact Sheet 35 Revised May 2009.

























**APPENDIX D  
ISSUE WORKSHEET**

## Issue Worksheet

Issue	Relevant? Y/N	Comments
1. Any treatments applied within the SMA proposal area should be consistent with the protection and promotion of the special attributes within the Piney Creek water shed.	N	The designation of a SMA for the Piney Creek watershed is outside the scope of this proposal.
2. TCA is concerned that the placement of firelanes between compartments 93 and 94 could exacerbate an existing illegal ORV use problem in the area.	N	This is a law enforcement issue and outside the scope of this proposal.
3. Any treatment applied to the proposed SMA should be compatible with applicable ecological management protocols.	N	The proposed SMA does not have specific management guidelines. Standards and guidelines from the FLRMP for MA-4 will be followed. Deferred burning C-70,71,72,73 until later date. Mitigated burning in C-94 by using backing/flanking fires.
4. Recommend a maximum burn unit size of 1,000 acres where feasible.	Y	There is no management direction to limit size of burn areas to 1,000 acres. Wildlife Technical Report does not support this recommendation.
5. Recommend a 3-5 year burn cycle	Y	This action is part of the proposal and is consistent with descriptions found in the Ecological Classification System.
6. Recommend long-term monitoring plots ...to capture the effects of fire on the Neches River Rose Mallow	N	It is not expected that fire will encroach on the wet habitat of the Neches River Rose Mallow. Monitoring plan already in place.
7. Identify the best management practices that would be employed to protect known RCW next cavities.	Y	Direction found in the RCW Recovery Plan will be followed.
8. Determine if suitable habitat occurs for species on Trinity and Houston County lists	Y	See Botany Report.
9. Design and implement project to avoid or minimize adverse impacts ...when rare plant and animal species and their habitat are found within or near the project area.	Y	Federally listed plants and animals will be protected.
10. Compartments 22, 23, 31 and 38 have been excluded from the proposed action area.	Y	Compartment 22 has been added to the project. Compartments 23, 31 and 38 will be covered by a future environmental assessment.
11. Aerial Ignition	N	There is no direction to no use aerial ignition.
12. Manage NNIPS	Y	See Botany Report.

The relevant issues identified above will be brought forward and analyzed in Chapter 3.