CHAPTER 1 - PURPOSE AND NEED FOR ACTION

Document Structure

The Forest Service is preparing an Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This document will disclose the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters:

Chapter 1. Purpose and Need for Action: The chapter includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2. Alternatives Considered: This chapter provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on issues raised by the interdisciplinary team, public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the proposed projects for each alternative and a comparison of issues by alternative.

Chapter 3. Environmental Effects: This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by Physical, Biological and Social Environments where individual resource topics are addressed under each of these headings. In this chapter, each resource specialist considered direct, indirect and cumulative effects and evaluate both short-term uses and long-term productivity of each alternative proposed for implementation.

Chapter 4. Project Consultation and Coordination: This chapter provides a list of preparers and agencies consulted during the development of the Environmental Assessment.

Appendices: The appendices provide more detailed information to support the analysis presented in the Environmental Assessment.

Appendix A – References Cited
Appendix B – Glossary of Terms
Appendix C – Biological Diversity
Appendix D – Economic Transactions
Appendix E – Crescent Project Maps with Table E-1 (Treatment Activity Table)
Appendix F –Biological Evaluation and Biological Assessment

Location, Background and Setting

The Mark Twain National Forest (MTNF) is located in southern Missouri. It is scattered across the Missouri Ozarks encompassing an area of 285 miles east to west and 100 miles north to south. In addition, one unit is located in central Missouri (Cedar Creek unit). The forest is divided into thirteen units located in nine contiguous blocks managed as six administrative units called Ranger Districts. Overall Forest direction is provided through the Forest Supervisors Office in Rolla, Missouri.

The Crescent Project Area is located between the Gasconade River and the western forest administrative boundary of the Houston/Rolla/Cedar Creek Ranger District on National Forest System lands. (see Appendix E for location map). The Crescent project is further divided into 23 units called compartments. These compartments are further divided into units called stands. A stand is a contiguous group of trees or other vegetation sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit (see Appendix E for Compartment and Stand Maps). The project area contains approximately 12,590 acres.

The city of Lebanon Missouri is located approximately 18 miles west of the analysis area on highway 32. The legal description of the project area is: government ownership in: Township 32 North, Range 13 West, section 6; Township 33 North, Range 13 West, sections 5-8, 15-22, 30, 31; Township 34 North, Range 13 West, sections 3-22, 27-31, 33; Township 35 North, Range 13 West, section 31, Fifth Principal Meridian.

By the late 1800's and early 1900's, there were many areas in Missouri that had been badly abused and in need of protection and rehabilitation. The Ozarks Region was one area. The Weeks Law, an Act of March 1911, enabled the Federal Government to look at suitable forest areas in Missouri for establishing National Forests. Prior to this legislation, all National Forests had been created from the public domain. Only in cooperation with the State of Missouri could the Federal Government begin buying land. Missouri had to pass enabling legislation implementing the provisions of the Weeks law. It took another piece of Legislation – The Clark-McNary Act of June 7, 1924 – before Missouri would pass an enabling act. The Clark-McNary Act enabled the Secretary of Agriculture to work cooperatively with State officials for better forest protection, chiefly in fire control and water resources. It also provided for continuous production of timber.

Missouri was added to Region 9 of the U.S. Forest Service in 1930. During 1934 and 1935, eight separate purchase units, embracing over 3 million acres was established. By the start of World War II, slightly more than 1.25 million acres had been approved for purchase by the National Forests Reservation Commission; and two National Forests, the Clark and the Mark Twain, had been established. The Mark Twain National Forest was combined with Clark National Forest as "The National Forests in Missouri" in 1973 and renamed "Mark Twain National Forest" headquartered in Rolla in 1976. Today, the Mark Twain National Forest is a direct result of the passage of time and active management and contains approximately 1.5 million acres under public ownership. Forest management on Public ownership began by containing wild fires and planting abandonded openlands. Timber sales were used to remove mature and less desirable trees while providing forest products and local jobs. Pasture land was rented to local farmers to maintain openings. These were management tools used throughout the Forest Service history in this area. Management activities within the Crescent Project Area in the past decade included pre-commercial thinning, commercial thinning, and commercial harvest (salvage of mortality, uneven-age harvest, and even-age harvest). Other activities in the Crescent project within the last 10 years include: maintenance of two grazing allotments, road reconstruction, tree planting and wildlife habitat work which included seeding, prescribed burning, mowing and pond development and maintenance. These different activities have been favorable to a variety of wildlife species.

Though wildland fires play an integral role in many forest and rangeland ecosystems, decades of efforts directed at extinguishing every fire that burned on public lands have disrupted the natural fire regimes that once existed. Moreover, as more and more communities develop and grow in areas that are adjacent to fire-prone lands in what is known as the *wildland/urban interface*, wildland fires pose increasing threats to people and their property.

The National Fire Plan was developed in August 2000, following a landmark wildland fire season, with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The NFP addresses five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability.

Activities in this analysis are similar in proportion to past projects except for an increase in acres of prescribed fire. The project-specific needs include: managing wildlife habitat, maintaining forest health, providing forest recreation and river access, reduction of non-native invasive noxious weeds, increasing native grass and forbs, maintaining and improving watershed quality and associated or connected actions.

Forest-wide Direction and Goals

Forest-wide direction guides all natural resource management practices and establishes management standards and guidelines for the Forest over the planning period. Management direction also includes:

- the goals, (LRMP, pages IV-1 to IV-4)

- objectives, (LRMP, pages IV-4 to IV-10)
- Forest-wide standards and guidelines, (LRMP, pages IV-11 to IV-86)
- management prescriptions with their specific standards and guidelines, and delineations of management areas. Management Area 3.4 (LRMP, pages IV-115 to IV-124), Management Area 6.2 (LRMP, pages IV-175 to IV-184), Management Area 6.3 (LRMP, pages IV-185 to IV-192-2), Management Area 8.1 (LRMP, pages IV-193 to IV-216),

The goals are concise statements describing a desired result to be achieved over the planning period, through implementation of the Mark Twain National Forest - Land and Resource Management Plan (LRMP or Forest Plan). Multiple use goals such as recreation, wildlife, timber, transportation, minerals, fire, soil, water, and air management apply to the Crescent Project.

Desired Forest Condition of Management Areas

The Mark Twain National Forest – Land and Resource Management Plan allocated lands within the Crescent Project Area to Management Areas 3.4, 6.2, 6.3, and 8.1. These allocations identified desired future conditions and gave general management direction for each of the management areas found in the Crescent Project Area. The Desired Future Conditions for the project are as follows:

Management Area 3.4 (9,850 acres or 78%), Establish a diverse, natural appearing mosaic of stands:

- Oaks will be the dominant species with a variety of other hardwood species, as well as shortleaf pine, eastern red cedar, pastures and hay meadows.
- Individual stands will have irregular shapes and sizes with similar age class and size, and
- Openings of various sizes and shapes will be interspersed through out the area.

Management Area 6.2 (1,820 acres or 14%), Empasize a semi-primitive motorized environment.

- Various species of oak will be the chief component, but a variety of other hardwood species will be present, as will mixed hardwood/shortleaf pine, shorleaf pine, eastern red cedar and grasslands
- Stand compositions will reflect natural vegetative communities for the site and their successional stages.
- Stand age and size will vary across the landscape so that a natural appearing environment featuring large tree conditions and old growth dominates.
- Openings created by even-aged timber management will be small in size.

Management Area 6.3 (920 acres or 7%)

- Management activities are based on the protection of the Gasconade River Corridor integrity.

Management Area 8.1 (10 acres <1%)

- Management activities are based on the protection of the Mayfield Spring Wet Meadow Special Area.

Management Area Prescriptions

The following statements give the goal for each Management Area in the project.

- **Management Prescription 3.4** (Management Prescription suffix – 5) emphasizes wildlife habitat diversity; dispersed, roaded recreation opportunities, moderate to high production of timber products, recreation, forage and minerals.

- **Management Prescription 6.2** (Management Prescription suffix – 1) features management of natural vegetative communities and their successional stages under limited investments; wildlife habitat diversity; semi-primitive, motorized recreation opportunities; low to moderate production of timber products, fish, wildlife, and forage.

- **Management Prescription 6.3** (Management Prescription suffix – 2) provides temporary management for the area along the Gasconade River until there is a determination on it's National Scenic River status. This management area emphasizes protecting the area's integrity. Low levels of resource outputs are permitted.

- **Management Prescription 8.1** (Management Prescription suffix – 1) is currently in place to protect the Mayfield Spring Wet Meadow

Management Practices and Associated Standard and Guidelines

Habitat Conditions

The Forest Plan established 8 categories for habitat condition objectives. Currently the Crescent project area meets Minimum Viability in 4 categories and meets the Desired Future Condition (DFC) in 2 categories. The proposed action will change the habitat condition to meet Minimum Viability in all 8 categories and move towards or meet the DFC in 6 categories.

The Forest Plan outlines general DFC's for each Management Area. With existing conditions that do not meet the DFC, the District Interdisciplinary Team (ID Team) has identified project specific activities (discussed later in this Chapter) that, once implemented, would move the existing conditions toward the DFC for Management Areas 3.4, 6.2, 6.3 and 8.1.

Forest Plan direction for wildlife habitat composition remains the same for Management Areas 3.4 and 6.3. There are 10,770 acres in these combined Management Areas. The following habitat conditions will be sought in the attainment of Management Prescriptions 3.4 and 6.3. "The objective of each plan period will be to move habitat conditions toward these steady state objectives as individual management area opportunities permit. Objectives are in terms of percent of National Forest System Lands". (LRMP, IV-118)

TABLE 1-1
Wildlife Habitat Composition for Management Areas 3.4 and 6.3

Habitat Condition	Crescent Existing Condition	LRMP *Minimum Viable*	Crescent Desired Condition
1. Woodland habitat in the 0-9 year age class	<1%	4%	8-15%
2. Woodland habitat in old growth (designated)	2%	5%	10-15%
3. Woodland habitat in Oak and Oak-Pine types over 50 years of age	42%	35%	45-55%
4. Woodland habitat in pole & sawtimber size classes with a crown closure over 80%	48%	20%	25-35%
5. Woodland habitat in oak, oak-pine & pine sawtimber with 20-30% forb, grass, shrub ground cover	12%	20%	40-50% of sawtimber
6. Woodland habitat in Oak type over 50 years of age with dense understory	9%	5%	10-15%
7. Open and semi-open habitats	19%	1%	10-20%
8. Permanent water sources (number)	34 sources	20 sources	20-80 sources

Forest Plan direction for wildlife habitat composition is slightly different for Management Area 6.2 than that for Management Areas 3.4 and 6.3. There are 1,820 acres in this Management Areas. The following habitat conditions will be sought in the attainment of Management Prescription 6.2. "The objective of each plan period will be to move habitat conditions toward these steady state objectives as individual management area opportunities permit. Objectives are in terms of percent of National Forest System Lands". (LRMP, IV-179)

TABLE 1-2 Wildlife Habitat Composition for Management Area 6.2			
Habitat Condition	Crescent Existing Condition	LRMP *Minimum Viable*	Crescent Desired Condition
1. Woodland habitat in the 0-9 year age class	0%	4%	5-15%
2. Woodland habitat in old growth (designated)	1%	5%	10-15%
3. Woodland habitat in Oak and Oak-Pine types over 50 years of age	45%	35%	40-50%
4. Woodland habitat in pole & sawtimber size classes with a crown closure over 80%	51%	20%	25-35%
5. Woodland habitat in oak, oak-pine & pine sawtimber with 20-30% forb, grass, shrub ground cover	4%	20%	25-35% of sawtimber
6. Woodland habitat in Oak type over 50 years of age with dense understory	3%	5%	5-10%
7. Open and semi-open habitats	9%	1%	4-10%
8. Permanent water sources (number)	6 sources	3 sources	3 sources

Purpose and Need for Action

The purpose of the Crescent Project is to implement land management activities that are consistent with direction in the Mark Twain Land and Resource Management Plan, the National Fire Plan and respond to the specific needs identified in the project area. Preliminary analysis of the Crescent Project Area indicates that there are certain conditions that warrant action to accomplish the management direction and desired future conditions identified in the Forest Plan. The following needs and proposed actions were identified to meet minimum viability (LRMP, IV-61) and move the existing condition of the Crescent area towards the Desired Future Condition (DFC). The Forest Plan established eight (8) wildlife habitat condition objectives (See Table 1-1 & Table 1-2) to maintain a wide variety of habitats (and the associated ecosystems with their ecosystem functions) that are commonly found in the Missouri Ozarks. The Oak-Hickory Hills and Oak-Hickory Plains Land Type Associations (LTA) wildlife habitat condition objectives are found in the Forest Plan on page IV-120 and IV-180 for the Crescent project. The wildlife habitat objectives could vary between Management Area. Currently the Crescent project area meets Minimum Viability in 4 categories and meets the Desired Future Condition (DFC) in 2 categories. The proposed action would encourage changes in the habitat conditions to meet Minimum Viability in all 8 categories and meet the DFC in 6 categories.

NEEDS:

The following needs were identified and are addressed in this project:

1. Recreation Management Needs.
2. Wildlife Habitat Maintenance and Improvement Needs.
3. Wildland/Urban Interface Fuel Reduction Needs. (National Fire Plan)
4. Protection of the Mayfield Spring Wet Meadow Needs.
5. Ecosystem Integrity and Watershed Rehabilitation Needs.
6. Tree Mortality Salvage Needs.

Note: There are also some associated or connected actions needed to implement these six emphasis areas in the Crescent Project.

Below is a more detailed description of these needs. The following needs for action were identified and the proposed actions (management activities) were designed to implement the Forest Plan. Activities in this analysis are similar in

proportion to past projects except for a significant increase in acres to be treated with prescribed fire. Specifically the following needs for action have been identified with approximate values:

1. Recreation Management Needs.

- **Need 1: Provide Dispersed recreation opportunities.**
  Currently the Crescent project area and the Gasconade River is a popular recreation area for dispersed camping, hunting, fishing, gathering forest products, hiking, wildlife viewing, horseback riding, mountain biking and driving for pleasure. Forest Service ownership provides most of the public Gasconade River access points for the approximately 30 miles of river in this project. The exception is county road bridge crossings. There are no Missouri Department of Conservation developed access points on this stretch of river. With the increase in use of the area, additional facilities and improved access sites are needed for public safety and watershed health.

2. Wildlife Habitat Maintenance and Improvement Needs.

The Forest Plan established various habitat condition objectives to maintain a wide variety of habitats (and the associated ecosystems with their ecosystem functions) that are commonly found in the Missouri Ozarks. The following wildlife habitat and improvement needs for action were identified and the proposed actions (management activities) were designed to meet minimum viability and move the existing condition of the Crescent Project Area towards the Desired Future Condition for wildlife habitat in the Oak-Hickory Hills and Plains Land Type Association as outlined in the Forest Plan.

- **Need 2A. Provide Woodland Habitat in the 0-9 year age class.** *Currently the Crescent Project Area does not meet the Forest Plan for Minimum Viability and the DFC in this category.*
  Species richness and species diversity in woodland habitats in the 0-9 year age class ranges from 40 to 49 animal species, but the edges of these habitats are used by 90 species that include 3 amphibians, 14 reptiles, 23 mammals, and 50 birds (including neotropical migrant birds). Currently there are 40 acres of 0-9 year age class habitat in the Crescent project area. In order to meet Forest Plan habitat objectives, this area needs at least 504 acres but should not exceed 1889 acres. Many of the black and scarlet oaks in the Crescent Project Area are nearing or past their life expectancy of 90 years, thus the majority of the 0-9 year age class would be created in these areas.

- **Need 2B. Provide Woodland Habitat in old growth condition.** *Currently the Crescent Project Area does not meet the Forest Plan for Minimum Viability and the DFC in this category.*
  Old growth habitats are used by approximately 87 terrestrial species (9 amphibians, 11 reptiles, 11 mammals, and 56 birds (including neotropical migrant birds)). Currently there are 241 acres of old growth habitat in the Crescent Project Area. In order to meet Forest Plan habitat objectives, this area needs at least 630 acres but should not exceed 1889 acres.

- **Need 2C. Provide a habitat condition where 40-50 percent of the sawtimber component of the Woodland Habitat in Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover.** *Currently the Crescent Project Area does not meet the Forest Plan for Minimum Viability and the DFC in this category.*
  Woodland habitats in oak, oak-pine, and pine forest types with 20% to 30% forbs, grass, and shrub ground cover are important habitat types for wildlife. Over 60 animal species are associated with this habitat type including 4 amphibians, 4 reptiles, 30 birds (including neotropical migrant birds), and 25 mammals. Currently there are 1,343 acres of this habitat in the Crescent project area. In order to meet Forest Plan habitat objectives, this area needs at least 2,519 acres but should not exceed 6,023 acres.

- **Need 2D. Provide Woodland Habitat in oak type over 50 years with a dense understory.** *Currently, the Crescent Project Area meets the Forest Plan for Minimum Viability, but it does not meet the DFC in this category.*
  This mature forest with dense understory (greater than 60% trees and tall shrubs) is usually associated with mesic forest on north and east facing slopes and in bottomlands. Wood thrush and ruffed grouse are Management

Indicator Species (MIS) associated with this habitat, which is used by about 74 species including salamanders, wood frog, ruby and golden-crowned kinglets, black bear and others. Currently there are 1,054 acres of this habitat in the Crescent Project Area. In order to meet Forest Plan habitat objectives, this area needs at least 486 acres but should not exceed 1,798 acres.

- **Need 2E. Provide Open and semi-open habitats.** *Currently the Crescent Project Area meets the Forest Plan for Minimum Viability and the DFC in this category.*
  Open and semi-open lands are important habitats for approximately 200 species. These areas provide a vegetative composition and structure that differs from predominately forested environments. These habitats are constantly declining due to plant succession (which is often the result of fire exclusion on the landscape). Therefore there is a need to maintain some of these open and semi-open areas. Currently there are 2,180 acres of this habitat in the Crescent Project Area. In order to meet Forest Plan habitat objectives, this area needs at least 125 acres but should not exceed 2,337 acres.

- **Need 2F. Provide Water Sources**
  These water sources include natural and constructed waterholes, springs, seeps, fens, and permanent streams or rivers. Waterholes or ponds are generally very small (about 1/10 – 1/4 acre) and fairly shallow (usually less than 10 feet deep). A small opening may surround some, while others are constructed within a forested stand. Maintaining these waterholes can include removing woody vegetation from the dam so roots will not breach it, hinge-falling one or more trees into the water to provide habitat for aquatic wildlife, or dredging sediment from the bottom of the waterhole to deepen it. These constructed waterholes are important as drinking water for many wildlife species and may also be utilized by amphibians and reptiles and insects. Currently there are 40 water sources in the Crescent Project Area. In order to meet Forest Plan habitat objectives, this area needs at least 20 water sources, but should not exceed 78 water sources.

3. Wildland/Urban Interface Fuel Reduction Needs

Currently, there is a need to reduce the risk of wildland fire to the urban interface as per the National Fire Plan. Primarily those communities identified in the National Register of Communities are at risk. The re-introduction of prescribed fire to the ecosystem is needed to increase the vegetative diversity and improve the overall health of the forest and in this case to reduce the risk of wildland fire to the urban interface.

4. Protect and Improve the Mayfield Spring Wet Meadow Special Area Needs

Currently, the Mayfield Spring Wet Meadow Special Area does not include special area designation to the river access, openlands, bluff, and slough around Mayfield Spring Wet Meadow. Current activity around Mayfield Spring indicates additional protection of the natural features in the area are needed.

5. Ecosystem Integrity and/or Watershed Health Needs

Activities that introduce, enhance or favor native species and species diversity contribute to ecosystem integrity. Presently, noxious weeds like multiflora rose and non-native invasive species such as fescue have replaced native species. Dense woods are less rich in forbs, grass, annuals and perennial plants. The re-introduction of prescribed fire to the ecosystem is needed to stimulate this plant diversity. Watershed health needs include erosion reduction and water quality improvement.

6. Dead/Dying Tree Salvage and Desirable Conditions for Tree Growth Needs

Areas of decline and mortality in oaks have been occurring on the Mark Twain National Forest for over twenty years. In the past few years, stresses from drought and age have made these oaks susceptible to attack by insects and disease. There are several forested portions of the Crescent Project Area that have dead and dying trees and to minimize adverse impacts from insects and disease these areas need to be treated. Creating desirable conditions (via salvaging mortality) would insure healthy tree growth, sustainable forests, and provide for production of timber products for the future.

Proposed Action

In an effort to enhance wildlife habitats, improve forest health, improve ecosystem integrity and watershed health, reduce wildfire fuels, and provide enhanced dispersed recreation, the Forest Service is proposing a range of management activities which would include commercial and non-commercial timber harvest, fuels reduction, prescribed fire, wildlife habitat enhancements, hiking trails, river access improvements, and road changes. The levels of activity are designed to meet minimum viability outlined in the Forest Plan and move the existing conditions of the Crescent Project towards the Desired Future Condition.

ACTIONS:

The following proposed actions were presented to the public in the January 15, 2004 scoping letter.

1. Recreation Management Needs

Need 1: Provide dispersed recreation opportunities, both on the Gasconade River and general forest ownership:

Proposed Action 1A: Maintain River Access Sites.

Maintain the 4 existing Gasconade river access sites of Mayfield Springs, Dry Branch, Wrinkle Springs and Brownfield. This would allow these areas to be used in the future and improve watershed health conditions.

Proposed Action 1B: Upgrade River Access Parking.

Upgrade river access parking at Mayfield Springs and Brownfield. These areas are not maintained as developed sites but will be hardened to allow river access while protecting the resource, improving water quality, and improving public safety.

Proposed Action 1C: Upgrade Trails.

Increase the Cole Creek Trail (approx. 4 miles) on to newly acquired Gasconade River ownership. Trail locations will be placed to limit erosion while providing increased access opportunities for horse, bike or foot travelers.

Proposed Action 1D: Increase Public Access.

Increase the roaded recreation opportunities by extending Forest Road (FR) 1655 to a new parking area within the open land above the river to allow traffic to the end of FR 1657. Add the existing road in T33N R13W Sec.19 to the road system which would require a right-of-way or relocation. These additions will increase the sightseeing, hunting and resource access to the area.

2. Wildlife Habitat Maintenance and Improvement Needs:

Need 2A: Provide Woodland habitat in the 0-9 year age class

Declining black and scarlet oak stands are targeted to meet this need which improves forest health and salvages forest products.

Proposed Action 2A1: Shelterwood Harvest

Create 320 acres of woodland habitat in the 0-9 year age class through shelterwood harvest on 640 acres. Proposed *Action 2A1 is a companion to Proposed Action 2D. It is listed here since the same activity provides woodland habitat in the 0-9 year age class and woodland habitat in oak type over 50 years with a dense understory.*

Proposed Action 2A2: Clearcut Harvest

Create 330 acres of woodland habitat in the 0-9 year age through clearcut harvest on 330 acres.

Proposed Action 2A3: Group Selection Harvest

Create 300 acres of 2A habitat through group selection harvests on 2020 acres.
Proposed Action 2A3 is a companion to Proposed Action 2C1. It is listed here since the same activity provides woodland habitat in the 0-9 year age class and 40-50 percent of the sawtimber component of the woodland habitat in the oak, oak-pine, and pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover.

Note: The above activities would allow the Crescent Project Area to meet the Forest Plan Minimum Viability and the Desired Future Condition (DFC) for this category.

Need 2B: Provide Woodland habitat in old growth condition

Proposed Action 2B: Maintain and enhance habitat for old growth wildlife species.

Designate 1350 acres of woodland habitat in old growth condition in the project area. These 1350 acres include a variety of forest types, and block sizes to provide a diversity of old growth forest conditions now and in the future at sustainable levels. Many of the black and scarlet oaks in the Crescent project area are nearing or past their life expectancy of 90 years, thus the majority of the proposed old growth consists of longer age species such as white oak and post oak.

Note: The above activities would allow the Crescent Project Area to meet the Forest Plan for Minimum Viability and the DFC for this category.

Need 2C: Provide a habitat condition where 40-50 percent of the sawtimber component of the Woodland Habitat in Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover.

Proposed Action 2C1: Group Selection Harvest

Create 1720 acres of woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover through group selection harvests on 2020 acres. *Proposed Action 2A3 is a companion to Proposed Action 2C1. It is listed here since the same activity provides woodland habitat in the 0-9 year age class and 40-50 percent of the sawtimber component of the woodland habitat in the Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover.*

Proposed Action 2C2: Removal of Overstory

Create 225 acres of woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover through removal harvests on 450 acres.

Proposed Action 2C3: Cedar Thinning

Create 110 acres of woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover by thinning 220 acres of cedar stands.

Proposed Action 2C4: Pine and Oak/Pine Thinning

Create 1050 acres of woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover by thinning 1300 acres of pine and oak/pine forest types.

Proposed Action 2C5: Oak Thinning

Create 520 acres of woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover by thinning 820 acres of oak forest type.

Proposed Action 2C6: Savanna Improvement and firewood removal

Maintain 230 acres of unique post oak savanna habitat and thereby contributing to woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover. This would be accomplished thru personal use firewood collection and prescribed burning on 230 acres.
Proposed Action 2C6 is a companion to Proposed Action 2E3. It is listed here since the same activity provides 40-50 percent of the sawtimber component of the woodland habitat in the Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover and open and semi-open habitats. This proposal is identified in Crescent project map set as Proposed Action 2C6.

Proposed Action 2C7: Improve Forest Health – Tree Mortality Salvage

Create 17 acres of woodland habitats in oak, oak-pine, and pine that exhibit a condition of 20% to 30% forbs, grass and shrub ground cover through salvage of tree mortality on 100 acres.
Proposed Action 2C7 is a companion to Proposed Action 6A. It is listed here since the same activity provides 40-50 percent of the sawtimber component of the woodland habitat in the Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover and tree mortality salvage.

Note: The above activities would allow the Crescent Project Area to meet the Forest Plan for Minimum Viability and the DFC for this category.

Need 2D: Provide Woodland Habitat in oak type over 50 years with a dense understory.

Proposed Action 2D: Shelterwood Harvest

Create 320 acres of woodland habitat in oak over 50 years with a dense understory through shelterwood harvest on 640 acres. *Proposed Action 2D is a companion to Proposed Action 2A1. It is listed here since the same activity provides woodland habitat in the 0-9 year age class and woodland habitat in oak type over 50 years with a dense understory.*

Note: The above activities would allow the Crescent Project Area to meet the Forest Plan for Minimum Viability and the DFC for this category.

Need 2E: Provide Open and semi-open habitats.

Proposed Action 2E1: Burn/Mechanical/Graze for Opening Maintenance

Maintain existing open and semi-open habitat by utilizing mechanical means, grazing and/or prescribed fire on 160 acres.

Proposed Action 2E2: Mechanical Treatment for Opening Maintenance

Maintain existing open and semi-open habitat by utilizing mechanical means such as brush hogging and or prescribed fire on 570 acres.

Proposed Action 2E3: Savanna Improvement with Firewood Removal

Maintain 230 acres of unique post oak savanna habitat. This would be accomplished thru personal use firewood collection and prescribed burning.
Proposed Action 2E3 is a companion to Proposed Action 2C6. It is listed here since the same activity provides 40-50 percent of the sawtimber component of the woodland habitat in the Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover and open and semi-open habitats.

Proposed Action 2E4: Maintain Existing Glades

Maintain 70 acres of glade habitat with mechanical means and /or by utilizing prescribed fire.

Note: By maintaining some of the existing open and semi-open areas, the above activities would allow the Crescent Project Area to continue to meet the Forest Plan for Minimum Viability and the DFC in this category. If no activity occurred in these open and semi-open areas they would eventually grow shut, resulting in a loss of this type habitat.

Need 2F: Provide Water Sources

Proposed Action 2F1: Build New Waterholes

Build 8 new ponds for wildlife. *Note: some of these may be deep enough to provide potential fish habitat.*

Proposed Action 2F2: Build Waterholes for Amphibians

Build 5 new fishless waterholes for amphibians. These shallow waterholes would be under 2 feet deep and may occasionally dry up during the dry summer months. *Note: these would not be suitable for fish habitat.*

Proposed Action 2F3: Improve Existing Waterholes

Improve 8 of the existing waterholes, some of which are no longer functional or there is a potential for future dam failure. Maintaining these waterholes can include removing woody vegetation from the dam so roots will not breach it, hinge-falling one or more trees into the water to provide habitat for aquatic wildlife, or dredging sediment from the bottom of the waterhole to deepen it. *Note: some of these may be deep enough to provide potential fish habitat.*

Proposed Action 2F4: Develop Waterhole with Drinking System for Livestock Use

Construct and/or improve 8 waterholes. These would have a drinker system installed. This would allow these waterholes to be fenced off from livestock use and would provide good water sources for various wildlife species. *Note: some of these may be deep enough to provide potential fish habitat.*
Proposed Action 2F4 is a companion to Proposed Action 5E. It is listed here since the same activity provides water sources and improves Ecosystem Integrity and/or Watershed Health.

3. Wildland/Urban Interface Fuel Reduction Needs

Need 3: Wildland/Urban interface fuel reduction burns.

Proposed Action 3A: Conduct Wildland/Urban interface fuel reduction burns

Introduce prescribed fire to 270 acres that are located near communities identified in the National Register of Communities at risk in order to reduce the risk (and fuels) of wildland fires.

4. Protect and improve the "Mayfield Spring Wet Meadow" Special Area Need

Need 4: Protect and improve the "Mayfield Spring Wet Meadow" Special Area.

Proposed Action 4A: Increase the Mayfield Springs Special Management Area

Increase the Mayfield Spring Wet Meadow Special Area designation (through a non-significant amendment of the current Mark Twain Forest Plan), from the current 10 acres, to that of, approximately 90 acres. This will change the current Management Areas 3.4 (providing a managed forest which emphasizes wildlife habitat diversity) and 6.3 (temporary management for a variety of areas that have potential for "special area" designation other than Wilderness), to Management Area 8.1 (protect areas of special scientific, biological, historical, geological, scenic, recreational, and educational significance).

5. Ecosystem Integrity and/or Watershed Health Needs

Need 5: Ecosystem Integrity and/or Watershed Health

Proposed Action 5A: Ecosystem Restoration Burns

Introduce prescribed fire to 2800 acres in the Crescent project area. *Note: Many of these burns would help to maintain existing open and semi-open areas (Need 2E).*

Proposed Action 5B: Fescue Control utilizing mechanical/herbicide/repeated burns

There are areas with non-native fescue. This fescue has replaced native species. The thick fescue mat does not provide good wildlife habitat. It also prevents the successful establishment of either warm season grasses and/or hardwoods. Therefore, the proposed action is to control 400 acres of fescue utilizing mechanical means and/or herbicide and/or repeated burns to help with the establishment of native hardwood species and native Warm Season Grasses. *Note: Any herbicide utilized would be applied following EPA and manufactures label directions.*

Proposed Action 5C: Plant Native Hardwoods in Riparian Areas

Several abandoned fields are located immediately adjacent to the Gasconade River. The proposed action is to improve bottomland riparian habitat by planting native hardwoods on 100 acres. *Note: Please see Proposed Action 5B, which would help with the successful establishment of hardwoods in existing non-native fescue fields.*

Proposed Action 5D: Plant Native Warm Season Grasses

The amount of existing native warm season grasses present in the Crescent Project Area has been greatly reduced due to plant succession and after being replaced by non-native fescue fields. The proposed action is to enhance the warm season grass component in existing open and semi open habitat by planting 500 acres with Eastern Gamma grass or other native warm season grasses. *Note: this will help improve the quality of the open, semi-open habitat. Please see Proposed Action 5B, which would help with the successful establishment of Warm Season grasses in non-native fescue fields.*

Proposed Action 5E: Develop Waterhole With Drinking System for Livestock

Construct and/or improve 8 waterholes. These would have a drinker system installed. This would allow these waterholes to be fenced off from livestock use and would provide good water sources for various wildlife species. *Note: some of these may be deep enough to provide potential fish habitat. Proposed Action 5E is a companion to Proposed Action 2F4. It is listed here since the same activity provides water sources and improves Ecosystem Integrity and/or Watershed Health.*

Proposed Action 5F: Control Noxious Weeds

Noxious weeds are replacing desirable native species. Therefore, the proposed action is to control noxious weed species such as multi-flora rose throughout the Crescent project area utilizing herbicides. *Note: Any herbicide utilized would be applied following EPA and manufactures label directions.*

Proposed Action 5G: Dump Clean-up

There are scattered illegal dump sites in the Crescent project area. These present a potential concern to public health and safety and may also present a watershed concern. Therefore, the proposed action is clean-up of these and/or future illegal trash dumpsites where present.

Proposed Action 5H: Improve Watershed health by closing and rehabilitating old road corridors.

There are many old road corridors that are presenting a watershed concern. Therefore, the proposed action is to improve overall watershed health by closing and rehabilitating 20 miles of existing old road corridors.

Proposed Action 5I: Watershed rehabilitation –Stream bank stabilization

Stabilize the eroding stream bank in Compartment 110 stand 53 using existing cedars in the area and planting native riparian species. The proposed action is to also stabilize the eroding stream bank in Compartment 103 stand 45 along the Gasconade River.

6. Dead/Dying Tree Salvage and create desirable conditions for tree growth to insure healthy, sustainable forests, and provide for production of timber products.

Need 6: Dead/dying Tree Salvage and Desirable Conditions for Tree Growth

Harvest dead and dying trees not included in other sale activities. Insect infestations are reduced by reducing brood trees producing boring insects and insect habitat. This treatment, increases oak reproduction success by obtaining sprouts while trees are still living (oak sprouts are the main source of oak reproduction).

Proposed Action 6A: Improve Forest Health - Tree Mortality Salvage

Improve forest health through tree mortality salvage on 100 acres in the Crescent project area. *Proposed Action 6A is a companion to Proposed Action 2C7. It is listed here since the same activity provides 40-50 percent of the sawtimber component of the woodland habitat in the Oak, Oak-Pine, and Pine exhibits a condition of 20-30 percent forbs, grass and shrub ground cover and tree mortality salvage.*

Associated or Connected Actions:

Proposed Action: Fire Line Construction:

A total of 3,853 acres have been identified for prescribed fire activity. Approximately 30 miles of fire line will be required. Existing roads and natural firebreaks would be used whenever possible.

Proposed Action: Access for Management Activities

Currently, there are approximately 15.5 miles of system road. There is a need for 7.6 miles of non-system road to be upgraded to system roads (This would require a non-significant Forest Plan Amendment). There is also 10.6 miles of private access roads across government ownership in this project area. Additional existing non-system roads totaling 6.9 miles need obliteration. Construction of approximately 15 miles of temporary roads will be needed for the proposed management. After completion of the harvest activities, these 15 miles of temporary roads would be closed and obliterated. Existing system roads will need maintenance or reconstruction.

Proposed Action: Right of Way

There are 6 existing roads that need right of way access through private lands to conduct business on Forest Service lands. We propose to obtain right of way access through these properties on negotiated terms with willing owners.

Proposed Action: Other road needs

The entrance to FR-1676 is proposed to be relocated due to the relocation/corrected adjustment of the landline in the area.

Note: Public firewood cutting areas will be provided in conjunction with timber sale and other wildlife activities.

Decision Framework

Given the purpose and need, the deciding official reviews the proposed action, other alternatives, and the environmental consequences in order to make the following decisions:

- Whether the proposed activities and alternatives are responsive to the issues, accomplish Forest Plan direction, and meet the purpose and need as defined for the Crescent Project,
- Which actions or alternative to approve and implement,
- Whether the information in this analysis is sufficient to make an informed decision, and
- If the activities can be implemented in a timely manner.

Public Involvement

A scoping letter with project description, maps, and project comment form was mailed to the district mailing list and adjacent neighbors on January 21, 2004 (282 addresses) to invite comments on the project. This project has also appeared in the forest-wide Schedule of Proposed Actions (SOPA).

On March 9, 2004 an additional mailing of a postcard was sent to the addresses of the 282 interested individuals/groups/neighbors requesting e-mail responses made previous to that date pertaining to this project be re-submitted via regular mail due to U.S. Government electronic mail security problems.

On 5/19/04 a field visit with 2 interested individuals from Heartwood was conducted by members of the Interdisciplinary Team. A number of proposed stands in the project were visited including: 1) a hardwood planting location, 2) a proposed Shelterwood, 3) a proposed old growth, 4) a proposed Oak/pine thinning, 5) a proposed Clearcut, 6) a proposed group selection cut, 7) a proposed pre-commercial thinning, and lastly, 8) a proposed savanna restoration.

Comments received during and after the scoping period were accepted and evaluated in the development of issues and alternatives to the proposed action. The District received 42 responses to the scoping document. All comments received were reviewed and evaluated by the Interdisciplinary Team (IDT).

Issues

The Deciding Official and IDT separated the issues into two groups: key issues and non-key issues. Key issues were defined as those directly or indirectly caused by implementing the proposed action. Non-key issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Deciding Official reviewed and concurred with the key and non-key issues. The Council on Environmental Quality (CEQ) NEPA regulations explain this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

Issues Used to Develop Alternatives Studied in Detail:

The purpose of soliciting comments during the scoping period is to determine where there are any unresolved issues, which affect a resource or the proposed action. Many issues and concerns, originating from public comments and internal agency concerns, are identified for analysis. Using the comments from the public, other agencies, and organizations, the interdisciplinary team developed a list of issues to address. A total of 42 comments were received. As for key issues, the Forest Service identified the following issues during scoping:

Issue #1: Amount of commercial harvest used to accomplish wildlife habitat objectives.
There are some people who feel that the purpose and need can be met by applying only non-commercial techniques. They feel that commercial harvest and other commercial activities are inappropriate uses of National Forest lands.

Others want the National Forest to continue producing commercial products, including wood products. They feel that Congress has made it clear that commercial uses are appropriate, effective, and in some cases desirable, on National Forest lands.

Measure: Acres of commercial harvest.

Issue #2: How well the herbicide is limited to target vegetation and the safety to the environment and applicator.
There are sections of the public who feel that the use of herbicides on National Forest lands is inappropriate. They feel that other methods of control for non-native invasive plants and noxious weeds should be used. There is also the concern

of the possible detrimental environmental effects on other resources from the use of herbicides. There is also the view that for certain non-native invasive plants and noxious weeds, herbicides are the most effective means to control spread. There is a need to control the spread of non-native invasive plants and noxious weeds, especially in areas where they are pushing out native plant populations. The Crescent project area has herbicides proposed for use in three areas. The concerns raised by the public and agency employees include:

A. The degree (intensity) of Herbicide used for control of Noxious Weeds in the Crescent Project Area.
Measure: Acres treated with herbicides (Glyphosate, Triclopyr) to control the spread and/or eliminate noxious weeds.

B. The degree (intensity) of Herbicide used for the conversion of cool season grasses (Fescue) to warm season grasses.
Measure: Acres treated with herbicides (Glyphosate) to convert openlands from cool season grass to warm season grass.

C. Degree (intensity) of Herbicide (Glyphosate) used for site preparation prior to Native bottomland tree species planting in dense fescue stands.
Measure: Acres treated with herbicides to prepare site for tree planting.

Issue #3: Amount of prescribed burning used to accomplish Crescent Project Area objectives.
A concern expressed by the public and agency employees is the potential risk for severe or catastrophic wildfire in the analysis area. The Crescent project area has 12,590 acres of public ownership but also has 20,600 acres of private ownership within the boundary. On August 17, 2001, the FEDERAL REGISTER published "Urban Wildland Interface Communities within the vicinity of Federal Lands that are at high risk from wildfire". Two communities in the Crescent Project Area are identified on this list. With the potential risk of severe or catastrophic wildfires, items of concern include safety of firefighters and the public in the path of wildland fires; damage to private property, forest resources, fences, and power-lines.

Another concern is a responsibility of the Forest Service and an ongoing effort to preserve and enhance the local ecosystems of the area and maintain and improve the biodiversity when possible. The methods used to accomplish any type of ecosystem restoration are varied. In this project prescribed fire is used to manage and enhance portions of ecosystem and maintain and improve the biodiversity of the Crescent Project Area.

Measure: Acres treated with prescribed burn to move from condition class III to condition class II.

Relationship to Other Documents

A number of National Environmental Policy Act (NEPA) decisions have been made since June 1986 (the date in which the Mark Twain Land and Resource Management Plan went into effect), which affected all or part of the Analysis Area. Some documents provided for site-specific implementation of the Forest Plan and some of the documents provided broader programmatic direction.

Site Specific Projects within the Crescent Project Area

Previous NEPA documents were written for the same kinds of activities (timber harvesting, reforestation, wildlife habitat maintenance, prescribed burning, old growth designation, pond maintenance, and roadwork) in the same geographical area as this project. The analysis done in these documents did not reveal any significant effects from the proposed activities. Post activity monitoring has verified that the analyses were compliant with the NEPA document and the effects were as displayed.

Since 1985, site-specific projects have been conducted whose decisions affect the Crescent Project Area.

The following Environmental Analyses with Decision Memos and resulting vegetation management activities were implemented within the Crescent Area boundary:

- 1989 Compartments 110, 111 Commercial thinning Decision Memo
- 1990 Compartment 101 Commercial thinning Decision Memo
- 1992 Compartments 98, 115 Wildlife Habitat Improvement Decision Memo
- 1993 Compartment 95 Pre-commercial thinning and Release Decision Memo
- 1994 Compartment 96 Pre-commercial thinning and Release Decision Memo
- 1994 Compartment 96 Commercial thinning Pine Plantations Decision Memo

The following Environmental Assessments with Decision Notices and resulting timber sales were implemented within the Crescent Area boundary:

- 1986 Compartments 103, 104, 105 Northwest Timber Sale
- 1992 Compartments 108 Overcut Timber Sale
- 1992 Compartments 95, 96, 112, 113 Burnt Cabin Timber Sale
- 1993 Compartments 101, 102, 103, 104, 109 - Big Bend Timber Sale
- 1994 Compartment 114, 115 - Way out Timber Sale
- 1994 Compartment 97, 98, 99, 100 - Simpson Timber Sale

These previous NEPA documents were written for activities that would implement the Forest Plan, and move the area toward its desired future condition. The analyses done in these documents did not reveal any significant effects from the proposed activities. The cumulative effects will take into account any activities occurring in the Crescent Project Area that were implemented following approval of these documents.

Table 1-3 below shows past accomplishments within the Crescent Project Area since 1985.

TABLE 1-3
Past Activities in the Crescent Project Area

Wildlife Habitat Improvement	Open Maintenance[1]	504 acres
	Burn	635 acres
	Plant[2]	293 acres
	Noxious Weed	102 acres
	Pond Maintenance	12 ponds
Timber Stand Improvement	Pre-Commercial Thinning	407 acres
	Release	64 acres
Harvest	Even-Aged Management Regeneration[3]	227 acres
	Uneven Aged Management Regeneration[4]	608 acres
	Salvage	31 acres
	Commercial Thinning	350 acres

[1] Open maintenance. = cut, mow, herbicide.
[2] Planting may include tilling.
[3] Even aged Management = Clearcut harvest, Shelterwood harvest
[4] Uneven aged Management – Group Selection harvests

Programmatic documents

Mark Twain National Forest Land and Resource Management Plan Final Environment Impact Statement and Record of Decision (Mark Twain National Forest 6/86, as amended).

The Forest plan is a programmatic document, which is required by the rules implementing the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA). The purpose of the Forest Plan is to provide direction for the multiple uses and the sustained yield of goods and services from National Forest System lands (NFS) in an environmentally sound manner.

The Forest Plan sets management direction for the Mark Twain National Forest through the establishment of short-term (10-15 years) and long-range goals and objectives through the year 2035. It prescribes the standards, practices, approximate timing and locations needed to achieve goals and objectives. The Plan prescribes the monitoring and evaluation needs necessary to ensure that direction is carried out; measures quality and quantity of actual operations against predicted outputs and effects, and forms the basis for implementing revisions.

The Secretary of Agriculture shall not be considered to be in violation of subparagraph 6(f)(5)(A) of the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (16 USC 1604(f)(5)(A)) solely because more than 15 years have passed without revision of the plan for a unit of the NFS lands (FY2002 Interior appropriations Bill, Section 327).

Following the signing of these earlier documents the Forest Plan has been amended to reflect new information concerning threatened, endangered, and sensitive species. This project analysis reflects those amendments and supplemental information reports to the Forest Plan.

Mark Twain National Forest Programmatic Biological Assessment (Mark Twain National Forest September 1998) and Biological Opinion on the Impacts of Forest Management and Other Activities to the Gray bat, Bald eagle, Indiana bat, and Mead's milkweed on the Mark Twain National Forest, Missouri (U.S. Fish and Wildlife Service, June 1999)

Federal agencies are required to comply with provisions of the Endangered Species Act (ESA) of 1973, as amended. This includes a requirement to consult with the U.S. Fish and Wildlife Service on projects, which may affect species federally listed as threatened or endangered (TE). These documents update the original consultation completed for the Forest Plan in 1985. They include species not originally consulted on and describe potential effects to federally listed species of activities that implement the Forest Plan. The Biological Opinion 1) determined that implementation of the Forest Plan would not jeopardize the existence of any of the species considered, 2) exempted the Forest Service from a specified amount of incidental take on three species, and 3) described mandatory Reasonable and Prudent Measures (RPM) along with associated Terms and Conditions (TC) to minimize the impacts of incidental take on the MTNF. The Forest Plan was subsequently amended March 2000 to include the RPM/TC as standards and guidelines. A decision on the proposed amendment for management of Areas of Influence was signed on November 16, 2001.

This analysis is tiered to the following programmatic documents:

- The Mark Twain National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision (6/86), as Amended, including all supplemental information reports.
- Mark Twain National Forest Programmatic Biological Assessment (Mark Twain National Forest September 1998).
- Biological Opinion on the Impacts of Forest Management and Other Activities to the Gray bat, Bald eagle, Indiana bat, and Mead's milkweed on the Mark Twain National Forest, Missouri (U.S. Fish and Wildlife Service, June 1999).
- Forest Plan Supplemental Information Report dated December 6, 2000 and April 5, 2001 Update concerning Chip Mills.
- Supplemental Information Report dated June 27, 2001 concerning 2000 Regional Forester's Sensitive Species List. (RFSS)
- Revised Forest Plan Supplemental Information Report for Salamanders, May 21, 2001.

- Glyphosate – Human Health and Ecological Risk Assessment Final Report. Prepared by the USDA, Forest Service by Syracuse Environmental Research Associates, March, 2003.

The following analyses are incorporated by reference:

- The Mark Twain National Forest Monitoring and Evaluation Reports from 1987 through present.
- Other Documents:
  - Weed Control methods Handbook (April 2001)
  - Ozark-Ouachita Highlands Assessment (December 1999)
  - National Fire Plan (January 2001)