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Brown's Hollow Area of Influence and Non-significant Forest Plan Amendment Environmental Assessment



Indiana bat (*Myotis sodalis*)

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Chapter 1- Purpose & Need

Project Location and Background

Location

The Brown's Hollow Area of Influence (AOI) is located within Wayne County, Missouri, within Township 28 North, Range 5 East, Sections 9-10, 14-16, and 21-23. It is located mostly west of U.S. Highway 67, east of Wayne County Road 372, south of the National Forest Boundary and north of Wayne County Road 371. The nearest town is Greenville, approximately 1 mile northeast of the project area. See attached maps for further detail.

The project area is also located in Management Area 4.1-4 on the Poplar Bluff Ranger District of the Mark Twain National Forest. Land management decisions in MA 4.1-4 emphasize the management of short-leaf pine in its natural range on sites where it is recognized as a dominant or characteristic member of the natural community (Forest Plan, IV-125).

The proposed AOI consists of two compartments: 28 and 29, containing approximately 4,027 total acres. Of this total, an estimated 2,197 acres are National Forest System managed lands, 1050 acres US Army Corps of Engineers (COE) and 780 acres private lands. Designation of the AOI and implementation of proposed Forest Plan Amendment would occur on National Forest System lands only.

The two compartments in this project area were part of the Pine Ridge project that is currently under analysis. When the maternity roost tree was discovered in May 2004, the Pine Ridge project analysis was suspended in order to identify an AOI and develop a management recovery strategy for the colony.

Background

Indiana bats

Indiana bats are small, insect-eating mammals that occur in eastern and southern parts of the United States, and have been listed as endangered since 1967. Missouri is home to about 13% of the world's estimated Indiana bat population. The Mark Twain National Forest has 2 known Indiana bat hibernacula (where the bats hibernate) with estimated populations of 1-250 Indiana bats. When they emerge from their hibernacula, Indiana bats roost in trees with flaking bark.

Indiana bat Surveys

Indiana bats were first discovered 12 miles southeast of the proposed AOI in September 2002, when Indiana bats were mist-netted on COE lands at Lost Creek near Lake Wappapello.

In 2003, surveys were again conducted at Lost Creek. In July 2003, two lactating female Indiana bats were captured on COE lands north of the proposed Brown's Hollow AOI near Big Lake Creek. However, these were not radio-tracked, so there is no further information about their movement or habitat use. Also in summer 2003, North Central Research Station (NCRS) personnel mist-netted on

MTNF lands in Browns Hollow about 2 miles from the COE capture sites (and within 1 mile of the maternity trees discovered in 2004), but captured no Indiana bats.

In May 2004, researchers discovered several roost trees used by pregnant Indiana bats. Forest Service researchers from NCRS assisted with the tracking of two pregnant Indiana bats fitted with transmitters. The tracking of one of these females allowed researchers to locate a maternity roost tree on National Forest System lands. This is the first documented maternity colony on the Mark Twain National Forest.

Consultation History

In 1984, the Forest Service requested formal consultation with the U.S. Fish and Wildlife Service (FWS) on the Forest Plan. On August 8, 1985, the USFWS issued a non-jeopardy Biological Opinion for seven federal species, including the Indiana bat. In 1998, the Forest Service reinitiated programmatic consultation for continued implementation of the Forest Plan. Further consultation was needed to incorporate information gathered about federally threatened and endangered species over the previous decade. A Programmatic Biological Assessment (BA) that included the Indiana bat was submitted to FWS in September 1998. In that document, the Forest Service determined that, based on the limited information on the presence and distribution of Indiana bats in the summer on the Mark Twain National Forest, this species may be present in appropriate habitat on the Forest from spring through summer.

On June 23, 1999, FWS issued a non-jeopardy Programmatic Biological Opinion for the Indiana bat, as well as three other threatened or endangered species, on the Mark Twain National Forest. All management activities implemented on the Mark Twain National Forest in potentially suitable habitat for the Indiana bat are consistent with the Reasonable and Prudent Measures, as well as the Terms and Conditions, discussed in the 1999 Programmatic Biological Opinion. The 1998 Biological Assessment and 1999 Biological Opinion are incorporated by reference.

Immediately following the recent discovery of the maternity colony, informal consultation was initiated with the US Fish and Wildlife Service under the Terms and Conditions of the 1999 Programmatic Biological Opinion.

Purpose and Need for Action

This action involves amending the Mark Twain National Forest Plan to provide protection and management for a recently discovered Indiana bat maternity colony on the Poplar Bluff Ranger District. The purpose of the Forest Plan amendment is to comply with the Programmatic Biological Opinion for the Indiana Bat and provide for protection and management of this newly discovered maternity colony.

The current 4.1 management prescription of the area, which focuses on commodity production, would be changed to a 3.5 management prescription, which provides for greater protection of, and specialized management for, the Indiana bat. The 3.5 Management Area is specifically managed to protect Indiana bats and their habitats within an area most likely to be used as foraging habitat by Indiana bats in the summer, and known sites of reproductively active females. Compliance with the Reasonable and Prudent Measures/Terms and Conditions (RPM/TC) of the BO is necessary to minimize the impact of incidental take on Indiana bats. A further purpose of this action is to comply with Section 7(a) (1) of the Endangered Species Act, as amended, by carrying out a program for the

conservation of an endangered species, and to contribute to recovery actions as outlined in the Indiana Bat Recovery Plan. The environmental assessment documents the analysis of 2 alternatives to meet this need.

The Desired Future Condition states that 3.5 Management Areas:

“...will be defined around occupied Indiana bat hibernacula and known sites of reproductively active females. Areas will vary in size, but will extend no more than 5 miles in radius from hibernacula, and no more than ¾ miles in radius from known sites of reproductively active females.” Further, “Management areas will provide a continuous supply of suitable roost trees and preferred foraging habitat for Indiana bat.”

The June 23, 1999 Programmatic Biological Opinion provides guidance in the form of Terms and Conditions and Reasonable and Prudent Measures (TC/RPM) for when an Indiana bat maternity colony is discovered on the Mark Twain National Forest. It also defines an “Area of Influence” on page 79:

“If maternity colonies are discovered on the MTNF, roost trees used by such colonies are to be protected by establishing a zone centered on the maternity roost site. The actual area will be determined by a combination of topography, known roost tree locations, the proximity of permanent water and a site-specific evaluation of the habitat characteristics associated with each colony. This area shall not exceed ¾ of a mile radius circle centered on location of a maternity roost following the findings of Gardner et al. (1991b), except as agreed to by the Service and Forest Service and determined to be the best science available, result in the discovery of a larger foraging radius. Protective measures shall be established by developing a management recovery strategy, in cooperation with the Service and MDC, immediately upon discovery. Within this area: 1) a minimum average of 24 potential roost trees per forested acre must be retained that may include snags, live shellbark and shagbark hickories >9" dbh, dead or dying trees with at least 10% exfoliating or defoliating bark >9" dbh, lightning struck trees >9" dbh, den or cull trees, and live trees >26" dbh, 2) the removal of occupied roost trees determined to be a safety hazard can only be done following consultation with the Service, 3) tree removal activities which would benefit the species may be performed only during a season when roosting bats are absent and only when it has been determined that roosts are unoccupied, 4) from 30% to 50% of mature oak-hickory and/or oak-pine forest with a canopy closure of 60- 80%, following the guidelines outlined in Romme et al. (1995), must be maintained.”

Relationship to the Forest Plan

The amended Forest Plan for the Mark Twain National Forest establishes the framework for project-level decision-making. The relevant components of the Forest Plan include: goals, objectives, desired conditions, management prescriptions (management areas), standards, and monitoring tasks. The Forest Plan does not compel the agency to carry out projects, but instead, it sets sideboards for the amount, type, and the way projects are implemented.

The Mark Twain National Forest is in the process of revising the existing Land and Resource Management Plan (Forest Plan) for the National Forest. A Notice of Intent to revise the Forest Plan was issued in 2002. As part of this process, various inventories and evaluations are occurring, including formal consultation with the USFWS on the Indiana bat. Additionally, the Forest is in the process of developing alternative land management scenarios that could change the desired future

conditions for areas on the Forest or could change the standards and guidelines for managing specific areas. A Draft Environmental Impact Statement (DEIS) will be published in the near future that will disclose the consequences of the different land management direction scenarios considered in detail.

In 2000, the Forest Service amended the Forest Plan to incorporate the Terms and Conditions of the 1999 Biological Opinion. In August 2002, the Forest Service amended the Forest Plan to add management direction and standards for protection and management of suitable habitat of the endangered Indiana bat. The environmental analyses for both amendments are incorporated by reference. The new direction and standards contained in Amendment 26 were derived from the Reasonable and Prudent measures and associated terms and conditions in the 1999 Programmatic Biological Opinion.

Relationship to Other Documents and Laws

The legal background and authority for forest plan amendments is found in the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA); implementing regulations found in 36 CFR Part 219.10 (f); the National Environmental Policy Act (NEPA); and implementing regulations found in 40 CFR 1500-1508. Specific direction regarding who is responsible and why and how to amend a forest plan is described in Forest Service Manual 1922 and Forest Service Handbook 1909.12 Chapter 5.

This proposed amendment is in accordance with Chapter V, page V-4 of the Land and Resource Management Plan of the Mark Twain National Forest; the requirements of 36 CFR 219.10(f); 36 CFR 219(k); and Forest Service Manual 1922. The amendment is programmatic in nature; that is, it provides overall guidance for management of the Forest rather than a specific project at a particular location. Further environmental analysis will be conducted for subsequent site-specific projects that implement the proposed Forest Plan amendment.

The Forest Supervisor is the authority in determining whether amendments are significant or not significant (36 CFR 219.10). This determination is made under the direction found in 16 U.S.C. 1604(f) (4), 36 CFR 219.10(f), and Forest Service Manual (FSM) 1922.5. The Forest Supervisor has followed these procedures and has determined that this is not a NFMA significant amendment to the Forest Plan because it does not meet both of the required definitions of significance found in Forest Service Manual (FSM) 1922.5.

The term “significant” as it pertains to a forest plan amendment is not the same as “significant” in the context of addressing environmental effects in a National Environmental Policy Act (NEPA) analysis (as might be found in the language of an environmental assessment). “Significant” as it pertains to a Forest Plan amendment gauges the impact of a proposed change to a forest plan. (FSM) 1922.52 lists two examples of circumstances that may cause a significant change to a Forest Plan:

- (1) Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected (36 CFR 219.10(e)); and
- (2) Changes that may have an important effect on the entire forest plan or affect land and resources throughout a large portion of the planning area during the planning period.

As defined in FSM 1922.51, non-significant amendments can result from:

- (a) Actions that do not significantly alter the multiple-use goals and objectives in the long-term land and resource management.
- (b) Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis when the adjustments do not cause significant changes in the multiple-use goals and objectives for long-term land and resource management; and
- (c) Minor changes to standards and guides.
- (d) Opportunities for additional management practices that will contribute to achievement of management prescriptions.

This proposed Forest Plan Amendment is an adjustment of management area boundaries, with minor changes to standards and guidelines. The area affected represents less than 0.15% of the Mark Twain's National Forest System lands. Because of the limited size, nature, and scope of the amendment, it would not alter the good and services projected in the original plan. Therefore, this amendment is considered "non-significant" with regards to NFMA and FSM 1922.

Proposed Action

The proposed action is to amend the Forest Plan to comply with the programmatic Biological Opinion by establishing an AOI for the recently discovered Indiana bat maternity roost tree on the Poplar Bluff Ranger District. We propose to change the current 4.1 Management Area for the Compartments 28 and 29 to 3.5 Management Area prescription.

Additionally, we propose to insert the following Management Recovery Strategy vegetative objectives (as described in the programmatic Biological Opinion on page 77) for maternity colony AOIs in the Forest Plan on page IV-124--2:

Each maternity colony Area of Influence will provide a continuous supply of suitable roost trees (Reference Forest Plan page IV-50--1) and foraging habitat by:

- Retaining a minimum average of 24 potential roost trees per forested acre that may include snags, live shellbark and shagbark hickories $\geq 9"$ dbh, dead or dying trees with at least 10% exfoliating or defoliating bark $\geq 9"$ dbh, lightning struck trees $\geq 9"$ dbh, lightning struck trees $\geq 9"$ dbh, den or cull trees, and live trees $\geq 26"$ dbh;
- Removing occupied roost trees determined to be a safety hazard only after consultation with the US Fish & Wildlife Service;
- Performing tree removal activities which would benefit Indiana bat habitat only during a season when roosting bats are absent and only when it has been determined that roosts are unoccupied; and
- Maintaining 30-50% mature oak-hickory and/or oak-pine forest with 60-80% canopy closure.

The Terms and Conditions of the 1999 Programmatic BO (page 79) provide for establishing an area greater than ¾ mile in radius as the AOI if agreed to by the USFWS and Forest Service and determined to be the best science available. The proposed AOI is larger, and is based on recent informal consultation between the US FWS and Forest Service after joint field review of the site-specific conditions in the vicinity of the known roost trees. The Forest Plan amendment would also change the wording in the Forest Plan to say the AOI should “normally” be no more than ¾ mile in radius to allow flexibility in defining the area.

Decision to Be Made

The decisions to be made are whether or not to amend the Forest Plan and change the management prescription for the Browns Hollow Area of Influence from a 4.1 MA emphasis to a 3.5, and whether to add vegetative objectives for maternity colonies to the Forest Plan. The Responsible Official for this programmatic decision is the Forest Supervisor. The subsequent decision would be subject to administrative appeal under 36 CFR 217.

Public Involvement

The project proposal was listed on the Mark Twain NF’s quarterly Schedule of Proposed Actions (SOPA) for June through September 2004. The SOPA was mailed to over 150 addresses and posted on the Mark Twain NF’s website.

On June 25, 2004, a scoping packet was posted on our website and sent to 178 addresses, including landowners adjacent to the project area, local newspapers, and county officials. The scoping packet included background information, specifics on the proposal, and maps, and requested comments be submitted by July 26, 2004. We received seventeen responses. The scoping packet, mailing list, public responses, etc., are available in the Project file (Folder A - Public Involvement).

A news release was distributed to Missouri newspapers. The St. Louis Post-Dispatch did an extensive article on Indiana bat mist-netting and the Forest Service researchers involved. The article was picked up by Associated Press and published in the Kansas City Star.

Issues

The interdisciplinary team reviewed all letters and records of phone calls to identify concerns, or issues, specific to the proposed action. A number of concerns and suggestions for alternatives were proposed. Public comments, along with the interdisciplinary team’s preliminary issues, were analyzed for their significance to the proposed action.

Issues are statements of discussion, dispute, or debate that represent points of unresolved conflict regarding specific environmental effects of the proposed action. Issues determined to be significant issues are those that have wide geographic extent, may have long-term effects, or which have a high level of interest or resource conflict. Significant issues are used to develop alternatives to the proposed action, prescribe mitigation standards, or determine the appropriate level of analysis for the environmental effects of the proposed action.

Issues that have already been decided by existing laws or by previous decisions at a higher level are not considered key issues. Other issues not considered significant include those that are not relevant

to the decision to be made, and those that are based on conjecture rather than scientific evidence. Non-significant issues generally include those that have little geographic extent, have short-term effects, and are not highly controversial.

Significant Issues

Using comments from the public and interdisciplinary team, the Forest Supervisor identified the significant issue relevant to the evaluating resource impacts and comparing alternatives.

Significant Issue is:

- **The level of Protection and Recovery of Indiana bat:** Some people expressed concern that the proposal would not provide protection for the Indiana bat. They are concerned that allowing timber harvest may impact the availability of suitable roost trees and potentially harm the species during harvest activities. Others said protection and recovery for the Indiana bat was unnecessary and outside our control.

Other Issues

The following list contains the issues raised during the scoping process that were not determined to be significant issues for the analysis. The rationale for making these determinations is presented along with the issue statements.

1. Indiana bats do not need additional protection.

Commentors suggested that the Indiana bats are not really endangered, the Endangered Species Act is expired, and the proposed action not needed. The question as to whether the Indiana bat is endangered and the legality of the Endangered Species Act has already been decided by a higher-level decision. The U.S. Congress, through the Endangered Species Act ((16 U.S.C. 1604), has given the Secretary of the Interior the responsibility and authority for determining whether a species should be listed as threatened or endangered. The Secretary of Interior made the determination that the Indiana bat was endangered on March 11, 1967 (*Federal Register* 32[48]:4001.)

2. Comments made on the draft Indiana Bat Recovery Plan need to be considered in evaluating the proposed action.

The decision to be made is whether to incorporate the information as described in the proposed action, or in some other way. Comments made on the draft Indiana Bat Recovery Plan and an evaluation of the adequacy of the draft Indiana Bat Recovery Plan are appropriate for the Indiana Bat Recovery team as they finalize the recovery plan. Those comments are not appropriate for this analysis. The development of the Indiana Bat Recovery Plan is a separate process, and is the responsibility of the USFWS. If direction in the final recovery plan changes the findings in the Biological Opinion, we will evaluate whether those changes require an amendment to the Forest Plan at that time.

3. The proposed action will negatively affect private property rights.

Many people were concerned that the proposed Standards and Guidelines would be applied to private property or affect their private property rights.

It was determined that this was not a significant issue because it has already been decided by law. The Forest Service has no legal authority to regulate or dictate actions on private property. The Forest Plan applies only to National Forest system lands of the Mark Twain National Forest (see Preface to Forest Plan, page i). The proposed standards and guidelines would apply only to National Forest system lands of the Mark Twain National Forest. They would not apply to private land. It does not include or imply any restrictions on private property.

4. The proposed areas of influence and management strategies could affect timber resource management activities and programs on National Forest System (NFS) lands.

This issue was considered significant in the 2001 Environmental Analysis for Establishing Areas of Influence and Management Strategies for Indiana Bat Hibernacula (Project File, Folder D, Document 3). The analysis considered the effects of establishing approximately 76,000 acres as Management Prescription 3.5 to protect Indiana bat hibernacula. That analysis found effects to the timber program to be minor because of the small percentage of acres affected, the small chance that those acres would have been scheduled for harvest, and that timber products can still be obtained from the areas of influence (Project File, D-3, pages 47 & 48). The Brown's Hollow AOI encompasses 2,197 of Poplar Bluff Ranger District's 156,500 acres (1.4% of the District and 0.1% of the Mark Twain National Forest). The designation of the Brown's Hollow AOI would present an unperceivable change in the timber program. Therefore, this issue will not be discussed further.

Chapter 2 - Alternatives

Introduction

This chapter describes alternatives to the proposed action and summarizes the environmental consequences of each alternative in relation to the issues. Information in this chapter will provide the decision maker with a range of alternatives to consider. It will include the analysis of the proposed activities and anticipated effects. The process used to develop alternatives, the description of alternatives to be analyzed in further detail, a comparison of those alternatives, and the reasoning for eliminating other alternatives that were considered from further analysis will be explored in this section of the EA.

Formulation of Alternatives

The Interdisciplinary Team analyzed both internal and external comments received during the scoping period. Alternatives were developed to respond to unresolved issues as they related to the purpose and need for this project, laws, regulations, and policies that govern land use on the NFS lands. The alternatives represent different levels and types of management activities. The alternatives, both those considered in detail and those eliminated from further study, display a range of options to meet the purpose.

A No Action (Alternative 1) alternative must be included as one of the alternatives. Alternatives to the proposed action (Alternative 2) must meet the purpose and need as stated in Chapter 1 and address the key issues described above. The IDT recommended that no other action alternative be analyzed in detail because of the limited nature and scope of the proposal. The Forest Supervisor agreed that the alternatives represent the range of concerns of the Forest Service, local residents, other agencies, and most members of the public that responded to the Forest Service during the public involvement phase.

Alternatives Considered in Detail

The following is a description of alternatives analyzed in detail by the Interdisciplinary Team. All acres listed are approximate.

Alternative 1 (No Action)

This alternative provides a baseline (reference point) against which to describe the environmental effects of the action alternatives. This is a viable alternative and responds to the concerns of those who want no change in the current management direction.

If Alternative 1 is selected, current management area direction would remain the same. Changes to the Indiana bat habitat might occur through current management direction, natural processes, or future management decision. Roads and ponds would continue to be maintained.

Alternative 2 (The Proposed Action)

Alternative 2 would amend the Forest Plan to comply with the programmatic Biological Opinion by establishing an AOI for the recently discovered Indiana bat maternity roost tree on the Poplar Bluff

Ranger District. The management prescription for Compartments 28 and 29 would change from 4.1 to 3.5.

Additionally, the following Management Recovery Strategy vegetative objectives for maternity colony AOIs would be inserted in the Forest Plan on page IV-124--2:

Each maternity colony Area of Influence will provide a continuous supply of suitable roost trees (Reference Forest Plan page IV-50--1) and foraging habitat by:

- Retaining a minimum average of 24 potential roost trees per forested acre that may include snags, live shellbark and shagbark hickories ≥ 9 " dbh, dead or dying trees with at least 10% exfoliating or defoliating bark ≥ 9 " dbh, lightning struck trees ≥ 9 " dbh, lightning struck trees ≥ 9 " dbh, den or cull trees, and live trees ≥ 26 " dbh;
- Removing occupied roost trees determined to be a safety hazard only after consultation with the US Fish & Wildlife Service;
- Performing tree removal activities which would benefit Indiana bat habitat only during a season when roosting bats are absent and only when it has been determined that roosts are unoccupied; and
- Maintaining 30-50% mature oak-hickory and/or oak-pine forest with 60-80% canopy closure.

The Forest Plan amendment would also change the wording in the Forest Plan to say the AOI should "normally" be no more than $\frac{3}{4}$ mile in radius to allow flexibility in defining the area.

Alternatives Considered but Not in Detail

Other potential alternatives were discussed but dropped from detailed analysis for varying reasons.

$\frac{3}{4}$ -mile circle: The ID team considered delineating the AOI in a circle centered on the maternity roost site. We rejected this idea because the arbitrary geometric approach did not take into account vegetative or geologic features that contribute to Indiana bats' foraging habitat. Additionally, a circle is more difficult to manage administratively. On the ground, it makes more sense to place administrative boundaries (such as the AOI management area boundary) along roads or other easily identified topographic feature. Therefore, the Forest Supervisor agreed not to consider this alternative in detail.

Larger AOI than proposed: The commenter suggested that an area of 5 miles in diameter be designated as the AOI. The purpose of an AOI is to concentrate beneficial management practices in an area most likely to be used by the Indiana bat. While 5 miles may be appropriate for an AOI around hibernacula, where males are likely to stay during summer (the bulk of known information on males says they may travel up to 5 miles from the hibernacula (USFWS 1999)); maternity colonies typically use a much smaller area for roosting and foraging ("pregnant and lactating females seldom

commute more than 3 km (1.8 mi) between roosts and feeding grounds and forage within an area approximately 1 km (0.6 mi) in diameter.”) (Bat Conservation International 2001)). Females must spend a large amount of energy in parturition and lactation, and so will use the smallest area where all their roosting and foraging needs can be met, in order to minimize the amount of energy spent flying between roosts and foraging areas. When looking at the physical conditions of the area near the capture site, known roost trees, and known foraging area, there are an abundance of potential roost trees, drinking water, and good foraging locations within the proposed AOI. Furthermore, the 1999 Programmatic Biological Opinion requires a ¾-mile area. The proposed AOI is larger than this. It encompasses more of the Brown’s Hollow drainage and two other tributaries to the St. Francis River. Therefore, we did not analyze this alternative in detail.

No Logging/Only Uneven-aged Logging: Logging, or timber harvest, is a common tool used in National Forest management. Uneven-aged management is a type of silvicultural method used during prescriptions for timber harvesting. Restricting the tools available for creating, maintaining, or enhancing Indiana bat habitat is not appropriate at the programmatic level. Any vegetative manipulation proposed in the Area of Influence would require site-specific NEPA analysis. The appropriate time to determine the type of tool to use would be at that time. Additionally, Alternative 4 in the 2001 EA for Establishing Areas of Influence (Project File, D-3) analyzed the effects of not permitting vegetative management, which is essentially the same as no logging. That alternative was not selected because it did not comply with the Biological Opinion’s recommendation to provide for optimum foraging habitat (see Project File, D-4, page 3). Therefore, an alternative that restricts logging will not be analyzed in detail in this analysis.

Table 2 - Alternative comparison by Objectives and Issues

Objective/Issue	Alternative 1 - No Action	Alternative 2 - Proposed Action
Does the Alternative meet the Terms and Conditions in Programmatic Biological Opinion?	No	Yes
Does the Alternative provide adequate roost trees?	Yes	Yes
Does the Alternative provide guidelines for foraging habitat?	No	Yes
Does the alternative allow harvest when Indiana bats are active?	Yes	No
Is the alternative consistent with the Forest Plan?	No	Yes

Chapter 3 - Environmental Effects

Affected Environment

The proposed Area of Influence encompasses National Forest lands in Compartments 28 and 29. This is part of the oak-pine breaks landtype association, and it consists of approximately 2197 acres (1.4% of the Poplar Bluff District). The current Management Prescription is 4.1, emphasis on shortleaf pine. The Combined Data System (CDS) database, an inventory of existing conditions on the Mark Twain National Forest lands, was used to determine forest types within the proposed AOI and historical activities that have been conducted in those areas. According to the CDS database, approximately 53% of the forest in the proposed Area of Influence is black oak-scarlet oak-hickory. Approximately 36% is a mixture of oak and pine. The remaining acreage consists of shortleaf pine, mixed oaks, white oak, sycamore-pecan-American elm, open areas, upland brush, and ponds.

Most of the area, approximately 78%, is 70 years of age or older and approximately 1% is less than ten years of age. Seventy-one percent of the forest that is predominantly oak within the proposed AOI is greater than 50 years of age and considered mature. Of this, 67% has a basal area greater than 80, according to the CDS database.

Many of the black and scarlet oaks in the proposed AOI are dying as a result of the red oak borer, oak dieback, and other tree diseases. This has created an abundance of snags, leaning trees, and downed trees, as well as canopy gaps within the area. Several windstorms and downdrafts have also occurred over the past several years, which have contributed to the abundance of dead and downed trees across the proposed AOI.

Various activities related to forest management have occurred in these compartments over the last several years. Documented activities within the past 25 years ago include clearcutting, shelterwood harvests, commercial thinning, cut to thin, pre-commercial thinning, site preparation, tree release, planting, treating open or semi-open habitats, prescribed burning, herbicide use, and the construction of water holes. In particular, a commercial thinning took place in 1992 in the stand where the primary maternity tree is documented.



Compartment 28, Stand 8 Megan York, July 2004

A number of arson fires have historically occurred within the proposed AOI. According to Forest Service fire records and conversation with Forest Service personnel, fires have occurred within the AOI for the last twenty-five or more years. Most recently in 2001, two of these fires, consisting of a maximum of 42 acres, burned within the proposed AOI. In April of 2000, 60 acres burned near FF Highway less than ½ mile from the recently documented maternity site.

Perennial streams within the proposed AOI are located to the north and east on Corps of Engineers land. These are Big Lake Creek and the St. Francis River, respectively. On the west side, Big Lake Creek continues to flow on private land. No perennial streams occur on National Forest lands within the proposed AOI, but several intermittent streams can be found. Four ponds occur in the area, along with road ruts that could be used as drinking water by the Indiana bat. In addition, two Forest Service system roads, FSR 3136 and FSR 3648, exist in the proposed AOI on National Forest lands. These roads are approximately 2.2 and 2.8 miles in length, respectively.

Threatened and Endangered Species

Consultation History:

On June 23, 1999, the U.S. Fish and Wildlife Service issued a 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 (BO). The BO included mandatory actions designed to minimize the impact of incidental take identified for the Indiana bat and other threatened and endangered species because of the continued implementation of the 1986 Land and Resource Management Plan (LRMP) for the Mark Twain National Forest. The Mark Twain National Forest prepared an environmental assessment, and, in a decision dated March 20, 2000, the Forest Supervisor amended the Forest Plan to include these mandatory actions, namely the Reasonable and Prudent Measures and Terms and Conditions. The Forest Plan was amended again on November 16, 2001, to create the 3.5 Management Prescription, and to designate approximately 76,000 acres as Management Prescription 3.5 within 5 miles of known Indiana bat hibernacula. This prescription allows (1) the establishment of Areas of Influence (around known hibernacula and where maternity colonies or lactating females are discovered on the Mark Twain National Forest), and (2) the development of management strategies for these areas that will contribute to the maintenance and recovery of the Indiana bat as required by the Terms and Conditions and Reasonable and Prudent Measures. Vegetation management is allowed in the Areas of Influence to improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities, or for public safety. The standards and guidelines in the 3.5 Management Area, as it relates to reproductively active Indiana bats, provide for a continuous supply of suitable roost trees and ample preferred foraging habitat.

Federal Species Considered:

Aside from the Indiana bat, there are no documented occurrences of any threatened or endangered species within the proposed AOI. Threatened and endangered species that have been found within the Poplar Bluff Ranger District Proclamation Boundary include bald eagle, gray bat, Hine's emerald dragonfly, running buffalo clover, pink mucket, and Curtis' pearly mussel. Bald eagles are likely to use the St. Francis River and possibly Big Lake Creek for nesting, foraging, resting, and possibly as a communal roost area. Gray bats are known to forage within the St. Francis River corridor. This species is highly dependent on caves, of which none are documented in the proposed AOI. No suitable habitat for the Hine's emerald dragonfly is documented within the proposed AOI. There are two documented populations of running buffalo clover within the Poplar Bluff District proclamation boundary, one on private land and one on National Forest lands. The population on National Forest was introduced in 1993 and is located approximately 10 miles southwest of the proposed AOI along the Black River. Neither the pink mucket nor Curtis' pearly mussel were found in the St. Francis

River during a survey in 2002. Because either these species do not occur within the proposed AOI, or there is no suitable habitat within the AOI for these species, there would be no effect on bald eagle, gray bat, Hine's emerald dragonfly, running buffalo clover, pink mucket, or Curtis' pearly mussel from implementation of either Alternative 1 or 2. These species will not be discussed further.

Alternative 1 (No Action)

Direct and Indirect Effects

If the No Action Alternative is selected, the U.S. Forest Service would not be in compliance with the Programmatic Biological Opinion or the 1986 Land and Resource Management Plan, as amended.

Because this proposal involves only an administrative change and no actual ground disturbance is proposed, there would be no direct effects to the Indiana bat or any other species as a result of maintaining the area in a 4.1 Management Prescription. Any ground disturbing activities within the two compartments proposed for the AOI would be evaluated in a separate Environmental Analysis. However, there may be indirect effects to the Indiana bat as a result of this alternative due to different priorities concerning management of the area.

Selection of Alternative 1 would not give the added emphasis to providing optimum Indiana bat foraging habitat and protection of roost trees. Management that would continue within Compartments 28 & 29 would be carried out as directed by the LRMP, Management Prescription 4.1, which emphasizes the management of shortleaf pine in its natural range. Roost trees and foraging habitat for Indiana bats would still be available, and optimum foraging habitat may still be created through timber harvest or vegetation management to reach the objectives of the 4.1 Management Prescription. However, the creation of optimum foraging habitat would be a result of other resource objectives, and would vary through time and space based, in part, on species and resource needs other than those of the Indiana bat.

Under Alternative 1, vegetation management, including tree removal and prescribed fire, could occur during the time bats were roosting in the area. This increases the potential for adverse impacts to individual bats or the colony. The stand in which the known roost tree occurs was commercially thinned in 1992, with no timing restrictions (i.e. no restriction on cutting during the time the bats could be using the area). Other stands within $\frac{3}{4}$ mile of this tree have also had commercial timber harvest within the last 25 years, with no timing restrictions. Obviously, the mere occurrence of timber harvest does not prevent the maternity colony from using this area. In addition, maternity roosts have been discovered in other highly disturbed areas (where hog lots killed overstory trees) (Gene Gardner, Jim Cope, and Rick Clawson, pers. observ. October 1996 as cited in USFWS 1999). Specific potential effects to Indiana bat from proposed activities would be described and analyzed in site-specific project assessments.

Even-age regeneration harvest is sought on 8-15% of Management Prescription 4.1 in the oak-pine breaks LTA (Forest Plan, IV-128). This means that if Alternative 1 is implemented, there could be clearcut, seedtree, or shelterwood harvests proposed in these two compartments now or in the future. Eight clearcuts, which were harvested between 1980 and 1994, are within $\frac{3}{4}$ mile of the known roost

tree on MTNF, one of which is the adjacent stand. While even-age regeneration harvests reduce the canopy below 30%, which should make them unsuitable as foraging areas, Indiana bats have been documented to forage in harvested areas including shelterwood cuts (Gardner et al. 1991a and MacGregor, pers. observ. June 1997 as cited in USFWS 1999).

If the area continues to be managed as a 4.1 Management Prescription, snags and cavity trees would still be retained during most management activities. Reserve trees, including snags and cavity trees would be designated in all even-aged regeneration harvests (Forest Plan, IV-129).

Cumulative effects

The bounds of cumulative effects discussion for this project are the project area (Compartments 28 & 29) and lands within 2 miles of these compartments. This is the greatest distance that we believe effects of this proposal would be meaningful. The timeframe is the next 10 years. That is the time period that we can reasonably foresee activities and effects with any degree of certainty. Beyond that, effects are much more speculative.

Cumulative effects are those effects resulting from a combination of past, present, and reasonably foreseeable actions taken by the Forest Service and/or other landowners within the cumulative effects area. Activities that are reasonably foreseeable on National Forest lands include continued management of Compartments 28 and 29, as well as National Forest lands south of these compartments, under a 4.1 Management Prescription. Various types of timber harvest could occur, including even-aged regeneration harvest that could reduce canopies below 30%. Prescribed burning may occur to address forest health, wildlife habitat, or fuel management needs. Management would not be conducted to specifically provide optimal foraging or roosting habitat for Indiana bat, but suitable habitat could exist as a result of meeting other management objectives. The two compartments would provide a mix of forest types and age classes through time. Road maintenance and reconstruction may occur, and various types of dispersed recreation opportunities would be available.

Reasonably foreseeable activities on other ownerships within 2 miles include Corps of Engineers, which owns land on the north and east side of Compartments 28 & 29, and will continue to manage and maintain existing open fields using techniques that include burning, bushhogging, and planting. In the future, COE may incorporate forest management to benefit Indiana bats recently documented in the area (pers. com. Gracey, 2004). At this time, private lands within 2 miles of Compartments 28 & 29 are a mix of homes, pasture, hayfield, and forest. At this time, there are no activities planned on private land to our knowledge that are not similar to current land uses.

The cumulative effect of all these activities on Indiana bats is that habitat conditions similar to what exists today would be available for the foreseeable future.

Alternative 2 (Proposed Action)

Direct and Indirect Effects

With the implementation of Alternative 2, the U.S. Forest Service would be in compliance with the Forest Plan, as amended, and can meet the Terms and Conditions listed in the Biological Opinion.

Alternative 2 would change the Management Prescription in Compartments 28 and 29 from 4.1 to 3.5. Vegetation management is allowed in the Area of Influence to improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities, or for public safety. Designation of the AOI and the 3.5 Management Area would insure that a management strategy is implemented to provide a sustained supply of suitable roost trees and preferred foraging habitat for the documented maternity colony, which would specifically benefit the Indiana bat. In particular, four Terms and Conditions listed in the Programmatic Biological Opinion concerning the protection and management of the AOI would be implemented. These Terms and Conditions include:

- 1) A minimum average of 24 potential roost trees per forested acre must be retained;
- 2) The removal of occupied roost trees determined to be a safety hazard can only be done following consultation with the U.S. Fish and Wildlife Service;
- 3) Tree removal activities which would benefit the species may be performed only during a season when roosting bats are absent and only when it has been determined that roosts are unoccupied; and
- 4) From 30%-50% of mature oak-hickory and/or oak-pine forest with a canopy closure of 60-80%, following the guidelines outlined in Romme et al. (1995), must be maintained.

These four Terms and Conditions constitute the required Management Recovery Strategy for the proposed AOI.

The change of Management Prescription from 4.1 to 3.5 would be beneficial to this colony of Indiana bats. While all Management Prescriptions are subject to standards and guidelines that provide some roosting and foraging habitat for Indiana bats, the 3.5 Management Prescription provides MTNF the best opportunity to create and maintain preferred foraging habitat and to protect known roost trees. In the long-term, this specific focus on management of Indiana bat habitat should improve the reproductive success and health of individuals in this colony, by providing all their life history needs in one place, so they do not have to expend extra energy flying long distances to forage or find appropriate roost trees.

The change of Management Prescription from 4.1 to 3.5 affects one maternity colony of Indiana bats. Maternity colonies typically have from 25-50 individuals (Bat Conservation International, 2001). A few maternity colonies have been documented to have around 300 individuals. Exit counts at the maternity roost tree that is the subject of this assessment found from 7-30 individuals leaving the tree (probably prior to pups being born). Assuming 30 females have one pup each, the largest number of bats this action would affect is 60. This is about 0.02% of the world's estimated population and about 0.08% of Missouri's estimated population. Assuming the largest colony, this action would affect about 600 Indiana bats or about 0.2% of the world's estimated population and 0.8% of Missouri's estimated population.

The proposed AOI is larger than ¾-mile radius, and is based on recent informal consultation between the U.S. Fish and Wildlife Service and Forest Service after joint field review of the site-specific conditions in the vicinity of the known roost trees. An examination of the site shows that large, dead trees are abundant, two permanent streams with some forested riparian corridor are present, mature and immature forest and woodland, and open fields are located within approximately 2 miles of the capture site. The known roost trees (only one on MTNF) are also located within about 1 mile of each other, with the capture site approximately 2 miles from the furthest roost tree. Considering that all key habitat components, and key components that are being actively used, are located within about 2 miles of each other, it did not make sense to limit the AOI to a ¾ mile radius. The movements documented for this colony are similar to the behavior of other documented maternity colonies in Missouri and across the range.

No direct effects would occur to Indiana bats because no ground disturbance is proposed with this alternative. Indirect effects would benefit the Indiana bat because Alternative 2 would designate an AOI with a management prescription to specifically provide optimal Indiana bat roosting and foraging habitat. Therefore, this alternative would result in the potential to create and maintain the greatest amount of preferred foraging habitat for the Indiana bat.

Analysis of landscape changes in Missouri, especially in the Ozarks, provides strong, convincing evidence that Indiana bats evolved in open to semi-open savanna-like environments in the western part of the species range. Future actions to implement the Management Recovery Strategy within the 3.5 Management Prescription may include the use of timber harvest and prescribed fires as tools to provide optimal foraging conditions for the Indiana bat by opening closed forest canopies (to achieve the 60-80% canopy closure) and decreasing dense understory vegetation that can inhibit movements to foraging habitats and roosting sites (Biological Opinion, page 63). In addition, roost trees in the form of snags would be protected. Tree removal would be conducted when the bats are not using the forest, thereby minimizing the potential for direct adverse impacts to roosting bats.

Prescribed burning stimulates density, diversity, and biomass, and increases arthropod prey abundance and flowering/seed production for ground flora including sedges, grasses, and many herbs. This in turn increases forage and breeding for numerous species of flying insect species in which Indiana bats forage. Prescribed burns conducted between October and March (dormant season) when Indiana bats are hibernating would minimize the potential for adverse impacts from smoke or fire because the bats would not be in the area. Prescribed burns conducted between May and August have the most potential for adverse affects to individual female bats and their young, since this is when females are pregnant or lactating and pups are non-volant (cannot fly). All Indiana bat areas of influence are considered smoke sensitive areas (IV-124--2) and any burn plans will be written to minimize smoke to the area.

During prescribed burns, large snags suitable as maternity roosts could catch fire, thus roost sites could be both created and destroyed during prescribed fires, depending upon intensity. Any ground disturbing activity proposed in the future will be analyzed in a separate NEPA document, and effects to threatened and endangered species would be discussed in detail at that time.

Cumulative effects

The bounds of cumulative effects discussion for this project are the project area (Compartments 28 & 29) and lands within 2 miles of these compartments. This is the greatest distance that we believe

effects of this proposal would be meaningful (see pg 17). The timeframe is the next 10 years. That is the time period that we can reasonably foresee activities and effects with any degree of certainty. Beyond that, effects are much more speculative.

Cumulative effects are those effects resulting from a combination of past, present, and reasonably foreseeable actions taken by the Forest Service and/or other landowners within the cumulative effects area. Activities that are reasonably foreseeable on National Forest lands include the designation of Compartments 28 and 29 as an Area of Influence and management of these 2 compartments under the 3.5 Management Prescription. In addition, a Management Recovery Strategy is incorporated that includes vegetation objectives for providing a continuous supply of potential and suitable maternity roost trees and ample preferred foraging habitat as outlined by Romme et al. (1995). Future site-specific management would be conducted specifically to provide optimal foraging or roosting areas for the Indiana bat. In particular, snags would be protected to provide 24 per forested acre and forest that is predominantly oak will be managed to provide a canopy closure of 60-80%, following the guidelines outlined in Romme et al. (1995). Benefits to the Indiana bat would occur over time, because the requirements of the Biological Opinion would be met, and there would be ample suitable habitat for the Indiana bat throughout the AOI.

Reasonably foreseeable activities on other ownerships within 2 miles include Corps of Engineers, which owns land on the north and east side of Compartments 28 & 29, and will continue to manage and maintain existing open fields using techniques that include burning, bushhogging, and planting. In the future, COE may incorporate forest management to benefit Indiana bats recently documented in the area (pers. com. Gracey, 2004). At this time, private lands within 2 miles of Compartments 28 & 29 are a mix of homes, pasture, hayfield, and forest. At this time, there are no activities planned on private land to our knowledge that are not similar to current land uses.

The cumulative effect of all these activities on Indiana bats is that optimal foraging and roosting habitat would be sustained on National Forest lands for the foreseeable future, and some additional suitable habitat would exist on adjacent lands.

Other Resources

The 2001 EA and DN for establishing Areas of Influence and creating the 3.5 Management Prescription (Project file, D3 & 4) document considered the effects of that action on the wildlife, RFSS, forest health, timber, minerals, special uses, range, recreation, and watershed programs. That analysis determined there was no change or only minimal effects by placing over 74,000 acres in the 3.5 management prescription. The Brown's Hollow AOI proposal is very similar in nature to that environmental assessment but affects only 2197 acres (or 3%). Therefore, the effects of this amendment would be no change or miniscule. The effects analysis from that EA are incorporated here by reference.

Designation of the Brown's Hollow Area of Influence is a programmatic decision with no ground disturbing activities. There would be no impacts to heritage resources or soil and water resources. There are no congressionally designated areas within the AOI, nor are there any prime farmlands. Therefore, there would be no direct or indirect effects on these resources. Since there are no effects, there are no cumulative effects.

Chapter 4 - List of Preparers

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