

United States Department of the Interior



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August 7, 2015

Mr. Thomas Haines, District Ranger
Salem Ranger District
Mark Twain National Forest
1301 S. Main
Salem, MO 65560

Dear Mr. Haines:

This letter is in response to your February 13, 2015, request for site-specific review, pursuant to section 7 of the Endangered Species Act of 1973, as amended, (ESA) on the proposed East Fork Huzzah Project on the Salem Ranger District (District) in Crawford, Dent, and Iron counties in Missouri.

We have reviewed the information contained in the Biological Assessment /Evaluation (BAE), which you submitted on April 13, 2015. We have determined that the actions and effects associated with the proposed East Fork Huzzah Project are consistent with those identified and discussed in the Service's Programmatic Biological Opinion (BO), which was issued by the Service on September 16, 2005, and amended in 2009, and evaluated the effects of all U.S. Forest Service actions outlined in the Forest Plan for the Mark Twain National Forest (MTNF).

The enclosed tiered BO addresses effects of the proposed action on the Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), Hine's emerald dragonfly (*Somatochlora hineana*), and running buffalo clover (*Trifolium stoloniferum*). Based on the size and scope of the project, the environmental baseline, the status of Indiana bat and its potential occurrence within the project area, the effects of the action; and any cumulative effects, it is the Service's biological opinion that this action is not likely to jeopardize the continued existence of the Indiana bat. Provided in the BO is a statement of anticipated incidental take as a result of the project and a brief list of discretionary conservation recommendations that the Service considers to aid in the recovery of the species.

Also enclosed is a BO addressing effects of the proposed action on the northern long-eared bat (*Myotis septentrionalis*) (NLEB). In a final rule published April 2, 2014, the NLEB was listed as federally threatened, with the listing becoming effective on May 4, 2015. In conjunction with the final listing rule for the NLEB, the Service published an interim rule under section 4(d) of the

ESA. Effective on May 4, 2015, the rule exempts take from ESA prohibitions for activities meeting certain provisions.

After reviewing the status and environmental baseline of the NLEB and evaluating potential effects of the proposed actions, it is our determination that these activities associated with the East Fork Huzzah Project are not likely to jeopardize the continued existence of the species. We also have determined that all activities associated with the East Fork Huzzah Project meet the provisions identified in the interim 4(d) rule of and comply with associated conservation measures. Thus, any take of the NLEB is exempted in the incidental take statement in the BO.

We appreciate your efforts to conserve threatened and endangered species. If you have any questions regarding our response or if you need additional information, please contact Trisha Crabill at 573-234-2132 x 121.

Sincerely,



Amy Salveter
Field Supervisor

Cc: USFS, Mark Twain National Forest, Wildlife, Rolla, MO (Theresa Davidson)

TIERED BIOLOGICAL OPINION

On September 16, 2005, the U.S. Fish and Wildlife Service (Service) issued a Programmatic Biological Opinion (Programmatic BO) for the Mark Twain National Forest (MTNF) 2005 Forest Plan (Forest Plan). This Programmatic BO established a two-tiered consultation process for Forest Plan activities, with the issuance of the programmatic opinion being Tier 1 and all subsequent site-specific project analyses constituting Tier 2 consultations. When it is determined that a site-specific project is likely to adversely affect federally listed species, the Service will produce a “tiered” biological opinion.

In issuance of the Programmatic BO (Tier 1 biological opinion), the Service evaluated the effects of all U.S. Forest Service actions outlined in the Forest Plan for the MTNF. The Programmatic BO evaluated the effects of Forest Service management program activities, including timber management and prescribed burning, on the bald eagle (*Haliaeetus leucocephalus*), Gray bat (*Myotis grisescens*), Hine’s emerald dragonfly (*Somatochlora hineana*), Indiana bat (*Myotis sodalis*), Mead’s milkweed (*Asclepias meadii*), Pink mucket pearlymussel (*Lampsilis abrupta*), Running buffalo clover (*Trifolium stoloniferum*), Scaleshell mussel (*Leptodea leptodon*), Topeka shiner (*Notropis topeka*), Tumbling Creek cavesnail (*Antrobia culveri*), and Virginia sneezeweed (*Helenium virginicum*). We concurred with your programmatic determinations of “no effect” for Virginia sneezeweed, running buffalo clover, and Topeka shiner. We concurred with your programmatic determinations of “may affect, not likely to adversely affect” for the Hine’s emerald dragonfly, Tumbling Creek cavesnail, pink mucket, scaleshell, bald eagle, and gray bat. We also concurred with your programmatic determination of “may affect, likely to adversely affect” for Mead’s milkweed and Indiana bat.

In June 2009, the Service provided MTNF with an amended Programmatic BO that addressed running buffalo clover and updated the status of the species for the Indiana bat. The MTNF also amended the Forest Plan in 2014 to reflect critical habitat designations for the Hine’s emerald dragonfly and Tumbling Creek cavesnail and for the listing of four additional species as endangered: the Ozark Hellbender (*Cryptobranchus alleganiensis bishopi*), snuffbox mussel (*Epioblasma triquetra*), spectaclecase mussel (*Cumberlandia monodonta*), and sheepsnose mussel (*Plethobasus cyphus*). The Service concurred with the MTNF’s determinations that the Forest Plan, as amended, is not likely to adversely affect the aforementioned species or adversely modify critical habitat of the Hine’s emerald dragonfly or the Tumbling Creek cavesnail.

Your request for Service review of the proposed activities associated with the East Fork Huzzah Project is a Tier 2 consultation¹ because (1) this proposed project falls within the scope of the Programmatic BO issued for the MTNF’s Forest Plan; (2) effects of this proposed action are consistent with those anticipated in the Tier 1 Programmatic BO; and (3) you have stated that the MTNF will adhere to the appropriate implementing terms and conditions associated with the reasonable and prudent measures identified in the Tier 1 BO.

¹ Tier 2 consultation currently do not include the northern long-eared bat (*Myotis septentrionalis*)(NLEB) because the species was not addressed in the Programmatic BO. A BO evaluating effects on the NLEB is provided after the tiered BO.

We have reviewed the information contained in the East Fork Huzzah Project Biological Assessment/Evaluation (BAE), submitted by your office on February 13, 2015 and describing the potential effects of the proposed project on the above federally listed species. **Based on information presented in the BAE, we concur with your determinations that project activities may affect, but are not likely to adversely affect the gray bat, Hine's emerald dragonfly, and running buffalo clover. We also concur with your determination that project activities are likely to adversely affect the Indiana bat.** Therefore, this tiered BO identifies incidental take of the Indiana bat anticipated from project activities. The tiered BO conforms to the Service's Programmatic BO (page 14) pertaining to individual projects the Service reviews following the issuance of the Programmatic BO. Because the northern long-eared bat is not included in the Programmatic BO, impacts to the species are considered in a separate non-tiered BO (following this BO).

Description of the Proposed Action

The East Fork Huzzah Project area is located on approximately 20,819 acres (ac) in the north central portion of the Salem Ranger District (Fig. 1). The area lies within the Meramec River Hills subsection of the Ozark Highlands State Natural Division, and Huzzah Creek is the main watershed in the project area.

The Salem District is proposing to conduct various silvicultural treatments within the East Fork Huzzah Project area to improve forest health and provide wildlife habitat diversity. The project will include a combination of commercial salvage harvest and post-harvest, non-commercial treatments for reforestation and stand improvement for enhancing open woodland conditions and reducing hazardous fuel loads caused by oak (*Quercus* spp.) mortality. The proposed action will also include other activities aimed at improving and enhancing the forest transportation system, soil and watershed health, and wildlife habitat in the project area. A list of proposed activities and affected area is provided in Table 1, followed by a description of each activity as provided in the BAE.

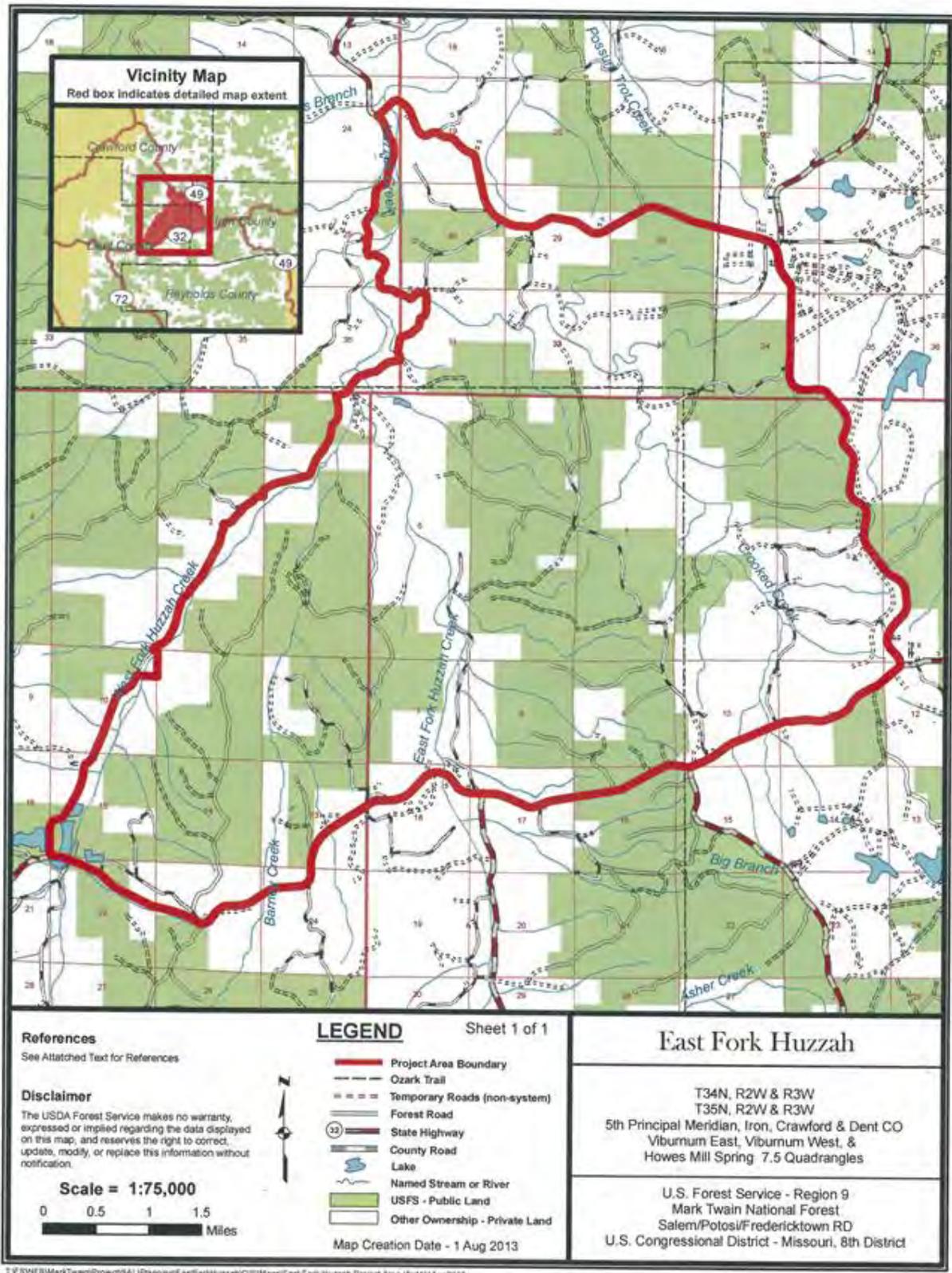


Figure 1. East Fork Huzzah Project area (map courtesy of the MTNF).

Table 1. Summary of activities associated with the proposed East Fork Huzzah Project.

Proposed Activities	Measures (Estimated)
Forest Health and Ecosystem Enhancement	
Clearcutting with Reserves	284 acres
Seed Tree with Reserves	95 acres
Shelterwood with Reserves	559 acres
Salvage	3,176 acres
Thinning	898 acres
Natural Regeneration	4,066 acres
Pine Planting	284 acres
Crop Tree Release	1,405 acres
Wildlife Habitat Enhancements	
Prescribed Fire Treatments	189 acres
Mowing	229 acres
Disking	111 acres
Seeding	111 acres
Hand-cutting	14 acres
Planting	77 acres
Pond Rehabilitation	17 ponds
Spring/Fen Rehabilitation	8 acres
Vernal Pool Construction	4 areas
Old Growth Designation	889 acres
Soil and Watershed Health Improvements	
Trash Dump Removal	19 dump sites
Barney Creek Stream Bank Stabilization	1.5 miles
Transportation System Actions	
Road Reconstruction	6.5 miles
Road Maintenance	7.9 miles
Pursue County Easement	0.4miles
Convert System Road to Non-system Road	1.1 miles
Decommission System roads	2.7 miles
Decommission Non-system roads	13.56 miles
Connected Actions	
Temporary Road Construction	19 miles
Skid trails and Log Landings	83 acres
Fire line Construction (dozer and handline)	3.8 miles
Existing Roads, Trails, and Natural barriers Used as Fire lines	1.4 miles

1) Silvicultural Treatments for Forest Health Improvement and Ecosystem Enhancement

Clearcutting with Reserves- The proposed action includes approximately **284 acres** of clearcut treatments. Clearcutting with reserves is the cutting of essentially all trees except for reserve trees, producing a fully exposed microclimate for the development of a new age class. Regeneration can be from natural seeding, direct seeding, planted seedlings, or advance reproduction. Varying numbers of reserve trees are retained to attain goals other than regeneration. Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Seed tree with Reserves - Approximately **95 acres** of seed tree with reserves harvest is planned for the analysis area. Seed tree with reserves is cutting all trees except for a small number of widely dispersed trees retained for seed production, and to produce a new age class in a fully exposed microenvironment. Some of the seed trees or other reserve trees are retained after regeneration has become established to gain goals other than regeneration. Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Shelterwood with Reserves - Approximately **559 acres** of shelterwood with reserves harvest treatments are proposed for the analysis area. Shelterwood with reserves is the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment. The sequence of cutting can include three types of cuttings: (a) an optional preparatory cut to enhance conditions for seed production, (b) an establishment cut to prepare the seed bed and create a new age class, and (c) a removal cut to release established regeneration from competition with the overstory. Some of the shelterwood trees or other reserve trees are retained after regeneration has become established to attain goals other than regeneration. Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Salvage - Approximately **3,176 acres** of salvage with reserves harvest is planned for the analysis area. Salvage cuts will harvest the stands with the worst mortality conditions of affected oaks. The objective is to remove dead and dying merchantable material which can still provide a product. Any group of remaining quality trees will be given more room and sunlight to promote their growth and provide larger trees more quickly. Canopy gaps will provide sunlight, which will then reach the forest floor and enhance the advanced regeneration of the shade intolerant species. Opening up the stands will also maintain or encourage a forage component by allowing light to reach the ground. Dead and dying trees that do not have a merchantable product will be left.

Thinning - Approximately **898 acres** of thinning harvest is planned for the analysis area. Commercial thinning is an intermediate treatment that reduces basal area by cutting and removing trees by means of a commercial timber sale. The treatments may be made to improve growth, enhance forest health, obtain advanced regeneration, or move the stand toward its natural community type. Treatment would occur in predominantly immature, smaller diameter pine (*Pinus* spp.) and pine-oak stands that have basal areas greater than 130. This treatment would improve growth and wind-firmness of residual trees, improve canopy openness and begin

development of ground flora (grasses and forbs). Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Natural Regeneration - This proposal includes approximately **4,066 acres** of natural regeneration. After the completion of harvest activities, suppressed, damaged, and undesirable trees would be cut to encourage regeneration. Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Pine Planting - Pine planting is proposed as the regeneration method for **284 acres**. Initiating pine growth in stands containing high percentages of black oak (*Quercus velutina*) and scarlet oak (*Q. coccinea*) increases species richness on the site and will improve tree species composition and stand vigor.

Crop Tree Release - Approximately **1,405 acres** of crop tree release are planned for the project area. Crop tree release is a treatment to free young trees from undesirable competition (usually overtopping), and can be used to improve the composition, structure, condition, health, and growth of a stand. Release treatments are made no later than 10 years of age in shortleaf pine (*Pinus echinata*) stands and no later than 15 years of age in hardwood and hardwood-pine stands.

2) Treatments to Enhance Wildlife Habitat

Prescribed Burning - Approximately **189 acres** of prescribed burning are proposed on three separate units in the analysis area: Beefsteak Fields (64 acres), Beefsteak North (26 acres), and Huzzah East (99 acres). These three units have been burned on several occasions previously in other projects. In this case, prescribed fire is used to open the understory, enhance the growth and diversity of grasses and forbs, reduce leaf litter, and control woody species. Connected actions include the construction of fire lines with dozer, leaf blower, and/or rake. Natural features (e.g., creeks) and manmade features (e.g., roads, trails) could be used as fire lines as well.

Mowing - Approximately **229 acres** of mowing are proposed in the analysis area. In this treatment, a rotary cutter (bush hog) pulled behind a wheeled farm tractor is used to cut brush, tall grass, forbs, and small trees. This controls the competing woody species and accelerates desirable grass and forb growth.

Disking - Approximately **111 acres** of disking are proposed in the analysis area. For this treatment, a farm disk pulled behind a wheeled farm tractor is used to turn the soil, pulverize it, and kill vegetation. This is done to kill undesirable vegetation and prepare the soil to plant seeds of desirable grasses and forbs to enhance openings and habitat for open land wildlife species.

Seeding - Approximately **111 acres** of seeding are proposed in the analysis area. For this treatment, a broadcast seeder or drill is used to plant seeds of desirable grasses and forbs in openings that have been prepared by disking. It also includes broadcast seed where the soil has not been disking (overseeding).

Hand-cutting - Approximately **14 acres** of hand-cutting are proposed in the analysis area. For this treatment, chainsaws are used to cut woody species (small trees) that are too big for a rotary cutter to mow. The stems may be left to lie where cut, piled by hand, or with a tractor or dozer.

Planting - Approximately **77 acres** of planting are proposed in the analysis area. For this treatment, hand tools (shovel, hoe) would be used to plant tree seedlings. This would be done in openings and open bottomlands to help stabilize stream banks, soil, and to re-establish forests in cleared areas.

Pond Rehabilitation - **17 ponds** are proposed for rehabilitation in the analysis area. This involves the rehabilitation of existing small wildlife ponds that are usually fishless and less than 1/10th of an acre in size. These ponds provide habitat for reptiles, amphibians, and insects as well as a water source for other wildlife species such as bats. Many of these ponds were built in the 1960's and have filled with sediment and vegetation, making them less suitable for wildlife. The rehabilitation would include cutting woody vegetation from the pond dams and the use of heavy equipment to breach the pond dam to drain the pond. An excavator or dozer would be used to remove vegetation and sediment. The dam would be repaired and the pond allowed to fill with water naturally (rain, run-off).

Spring/Fen Restoration - **8 acres** are proposed for spring/fen restoration in the analysis area. This involves the restoration of springs that have been dammed into ponds. The dam(s) would be breached with heavy equipment (dozer, excavator) and the spring branch restored to natural flow to the maximum extent possible. Heavy equipment could also be used to restore the spring branch channel if needed. It also involves using a chainsaw to cut woody shrubs and trees in a fen near Barney Creek. The work would be done when the ground is frozen and the cut shrubs and trees would be dragged by hand from the fen.

Vernal Pool Construction - **4 areas** are proposed for vernal pool construction in the analysis area. This involves the use of heavy equipment (dozer, excavator) to construct small, ephemeral, pools. These pools would be shallow, seasonal, temporary wetlands. They periodically dry up in late summer or fall and do not contain fish. Vernal pools provide breeding habitat for amphibians and invertebrates and a water source for many species of wildlife.

Old Growth Designation - Approximately **889 acres** in the analysis area are proposed for old growth designation. For Management Prescription 2.1, the forest plan recommends that areas exhibiting old growth characteristics comprise 8% to 12% of the management area (Forest Plan, 3-11). The designations in this proposal will move the analysis area towards this desired condition.

3) Treatments to Improve Soil and Watershed Health

Trash Dump Removal - There are **19 illegal dump areas** in the analysis area that are proposed for clean-up. These illegal dumps present a potential watershed concern that could impact surface and subsurface water quality and which could impact various wildlife species. In addition, they present a concern to public health and safety.

Barney Creek Stream Bank Stabilization - Approximately **1.5 miles** of stream bank along Barney Creek in the analysis area are proposed for stabilization. Barney Creek is an upper tributary stream to the Huzzah Creek and part of the headwaters of the Meramec River. There is interest in working in the headwaters of the Meramec drainage to help reduce sediment and gravel loads to the main stem and to improve headwaters habitat for aquatic organisms. This will also help to improve habitat in the drainage for mussel species and for their host fish species. Sections of Barney Creek are too wide and shallow to support pool development for aquatic habitat or the stream is entrenched as a gully causing an additional sediment load to enter the stream from steeply eroding stream banks. Loss of riparian vegetation has contributed to bank destabilization and sedimentation of the creek. Large woody material (LWM) will be placed to improve stream morphology and aquatic habitat. Stream Channel Restoration will occur in areas where the placement of large woody material would not improve stream morphology and aquatic habitat. Hardwood tree seedlings will be planted in open bottomlands along Barney Creek to help restore bottomland hardwood forest and stabilize creek banks.

4) Transportation System Management

There are approximately 17.1 miles of National Forest System road within the East Fork Huzzah Project area. National Forest System roads are under the jurisdiction of the Forest Service and determined to be needed for long-term motorized access. Non-system roads are roads on NFS lands that are not managed as part of the Mark Twain National Forest Transportation System. There are approximately 15.7 miles of non-system roads in the analysis area. Examples of non-system roads are, but not limited to, user-created roads or trails and abandoned travel ways. Non-system roads are considered part of the general forest area and motorized travel off of system roads and designated motorized trails into the general forest area is prohibited.

Approximately 6.5 miles of National Forest System roads have been identified for reconstruction. The conditions of these roads have deteriorated over time and currently do not meet Forest Service engineering standards. Road reconstruction consists of improvements to the original surface material and constructing drainage features. In some cases, realignment of the road may be necessary. Approximately 7.9 miles of National Forest System roads have been identified for maintenance. Road maintenance would consist of the on-going upkeep of a road, necessary to retain or restore the road to the approved road management objective. Activities associated with road maintenance may include surface blading, replacement of surface material, mowing and limbing of roadside vegetation, cleaning and restoring drainage features, and replacing road signs. In addition, there is approximately 0.4 miles of system road for which the Forest Service is seeking to transfer an easement to Crawford County. If there is no easement transfer, a special use permit will be issued to the adjacent private landowner. Approximately 1.1 miles of additional system road will be converted to non-system road and a special use permit will be issued to the landowner.

Approximately 1.2 miles of National Forest System roads and 13.56 miles of non-system roads have been identified for decommissioning. The remaining 2.14 miles of non-system roads are currently under special use permits for adjacent landowners and would not be decommissioned. Road decommissioning would result in the stabilization and restoration of unneeded roads to a

more natural state. Decommissioning activities include blocking access with earthen or rock berms, boulders, or slash piles, recontouring, and revegetation by seeding, planting, and fertilizing.

Connected Actions - Vegetation and road management activities cited above also include actions that are connected and necessary for implementation. These connected actions include approximately 19 miles of temporary road for timber sale access, 83 acres of skid trails and log lands, and approximately 5.2 miles of fire line required to safely implement the planned prescribe burns in this project. This includes approximately 3.7 miles of dozer-line and 0.1 mile of hand-line. The remaining 1.4 miles of fire line consists of existing roads and natural barriers.

Status of the Listed Species within the Project Area

Species description, life history, population dynamics, status and distribution for the Indiana bat range-wide and for Missouri are fully described on pages 23-32 of the 2005 Programmatic BO and the 2009 amendment to the Programmatic BO and are hereby incorporated by reference.

Since development of the 2009 amendment to the Programmatic BO, White-nose syndrome (WNS) has been confirmed in bats in Missouri in multiple locations (Fig. 2). Spread of the fungus into Missouri, combined with the documented deaths of Indiana bats in other locations from WNS, further threatens the species with extinction.

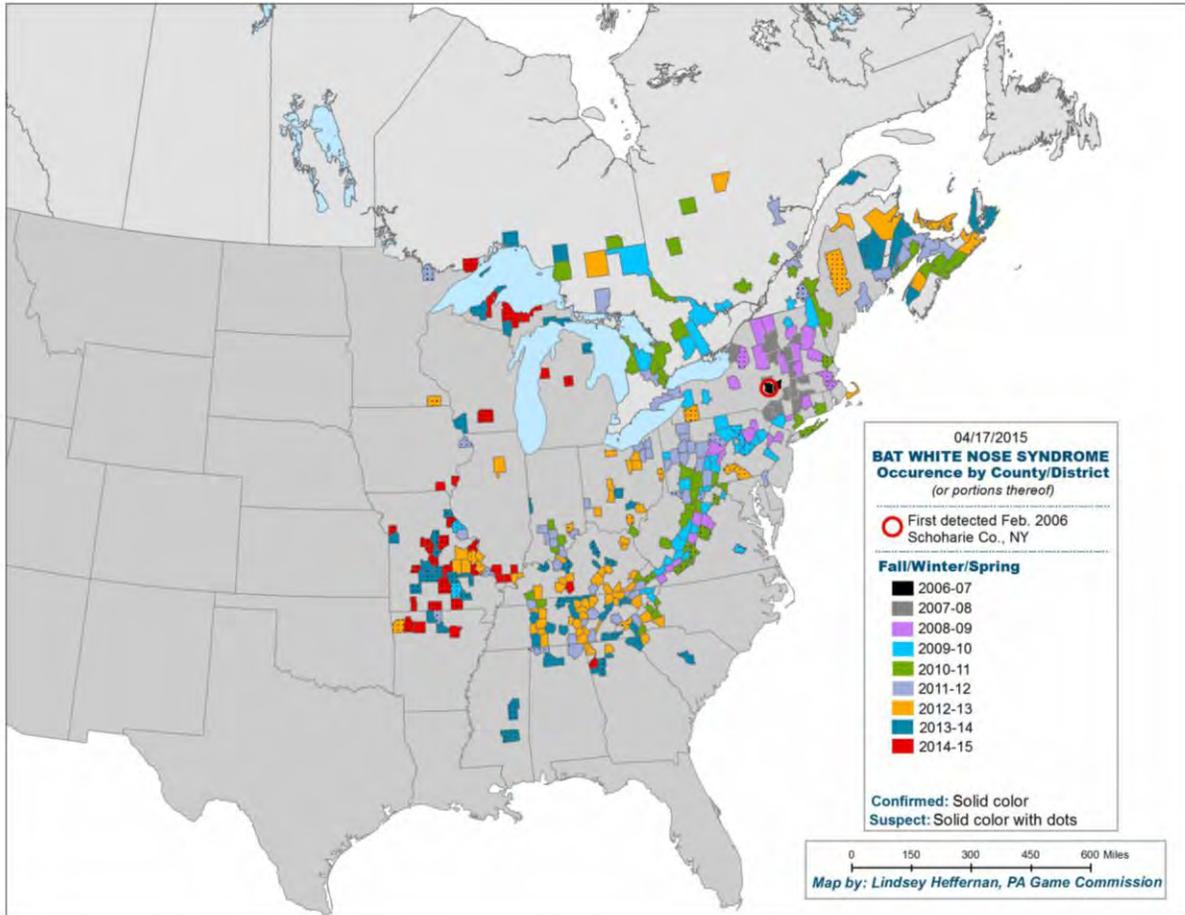


Figure 2. Documented occurrence of White Nose Syndrome (WNS) as of April 17, 2015. Map courtesy of Lindsey Heffernan.

Environmental Baseline

The environmental baseline for the MTNF was established and fully described in detail on pages 12-13 and 34-45 of the Service’s 2005 Programmatic BO. Since issuance of the Service’s Programmatic BO, the environmental baseline on the MTNF changed only slightly.

In the early spring 2006, several tornadoes have destroyed forest land within the 29 county area of the MTNF. Approximately 3,000 acres of the MTNF was affected by these events, though the entire 3,000 acres was not entirely destroyed (Jody Eberly, MTNF pers. comm.). In 2008, wind storms affected approximately 50 acres of forest land on the MTNF.

Status of the Species with the Project Area

There are Indiana bat capture records from 2004 and 2005 within the project area. The project area includes part of the Salem/Potosi Indiana Bat Area of Use (AOU) that was established as a result of the 2005 captures.

Hibernacula - The closest Indiana bat hibernaculum is located approximately 4 miles southeast. This cave recently tested positive for WNS fungus. There are caves documented within/near the project area, but those caves are not known to support Indiana bats.

Maternity Habitat and Male Roosting Habitat - One reproductively active female was captured within the project area in 2004, with two more captured in 2005. No maternity colonies or roost trees were located as a result of the 2004 survey; however, five female roost trees were located as a result of the 2005 study. Based on these captures and roost tree exist counts, it is highly probable that that two maternity colonies were present, with at least 49 Indiana bat females present in the area.

The closest record of a non-reproductive female (juvenile) is from July 2014 and is approximately 8 miles south of the project area on private land. The roost tree (a pine snag) associated with this capture is also 8 miles south of the project area. The maximum number of bats recorded during emergence counts from this tree is 27. The closest record of a male is a capture from 2005 within the project area. The most recent capture of a male is from 2010 and is 7 miles southwest of the project area.

Roosting Habitat - The project area has potential roosting habitat for Indiana bats. One of the male roost trees from the 2005 captures occurs within the project area, but the tree no longer provides suitable roosting habitat. The area is heavily forested with some openings. There is oak mortality within the project area so there are several scattered dead and damaged trees (some large diameter snags) that could be suitable roost trees for male and female Indiana bats. Therefore, it is possible that male roost trees and maternity roost trees may occur within the project area.

Foraging Habitat - The East Fork Huzzah Project area has potential foraging habitat for Indiana bats. The project area includes male and female foraging habitat recorded in 2004 and 2005. The area is heavily forested with some openings, has some forested stands with open canopies, and available permanent water. Although no Indiana bats have been captured within the project area since 2005, it is possible that foraging Indiana bats may still use the project area. The oak mortality condition in the East Fork Huzzah Project area presents a need for action to improve forest health through vegetation management. Stand data shows a substantial divergence from the historical Natural Community structure in existing forest stand conditions. This trend represents a loss in biodiversity that may also be reversed through the proposed management activities for ecosystem enhancement.

Migration Habitat - It is not known what the extent of existing migration habitat is on the MTNF. It is assumed that any of the MTNF could be potential migration habitat; therefore it is reasonable to assume that the project area could be potential migration habitat as well.

Fall Swarming Habitat - It is not known if any of the hibernacula on MTNF serve as swarming sites, or if the bats using these caves swarm and mate in a different location before moving to MTNF caves. Regardless, the bats which use MTNF caves for hibernation most likely use some area around the entrance of the caves for foraging and roosting in the days leading up to hibernation. The best scientific information available indicates that during fall swarming, the size of the area used is likely correlated with the size of the colony using the cave (2005 Programmatic Biological Opinion). The East Fork Huzzah Project area is located approximately 4 miles from an Indiana bat hibernacula, which has a relatively small hibernating population in the past. Due to the proximity of the project area to the cave (part of the project area- approximately 131 acres is within 5 miles of the cave), and the fact that Indiana bats have been captured within the project area, it is possible that the south part of project area could be used by Indiana bats for fall swarming habitat.

Effects of the Action

Several of the activities associated with the East Fork Huzzah Project are not anticipated to impact the Indiana bat. However, activities identified in Table 2 have the potential to result in impacts to the species. These impacts would be in the form of disturbance, injury, or mortality to roosting Indiana bats during spring staging, summer, or swarming periods. Impacts will be minimized by restricting hazard tree removal to the period between November 1 and April 1 whenever possible, as well as by implementing the other terms and conditions associated with the reasonable and prudent measures (RPMs) provided on pages 75-81 in the Programmatic BO. Because management activities within the Indiana bat AOU will occur during the hibernation period (November 1 – April 1) and thereby protect known maternity colonies, individuals most likely to be impacted are males and non-reproductive females.

Effects to hibernating Indiana bats are not anticipated because the nearest Indiana bat hibernaculum is 4 miles from the project area. Conservation measures will be implemented to minimize the potential that smoke from prescribed burns does not settle heavily in areas containing these caves².

Based on our analysis of information provided in your revised BAE, we have determined that potential effects from these activities are consistent with those addressed in the Programmatic BO and are hereby incorporated by reference.

² The closest prescribed burn unit is 6 miles from a known Indiana bat cave.

Table 2. Proposed activities having the potential to impact the Indiana bat.

Proposed Activities	Project Area
Salvage harvest	3,176 acres
Hazard tree removal – fire line construction	5.2 miles ³
Hazard tree removal - skid trails, log landings, and temporary roads	118 acres
Road reconstruction	15.76 acres
Total	5.2 miles 3309.76 acres

Conclusion

The actions and effects associated with the proposed East Fork Huzzah Project are consistent with those identified and discussed in the Service’s Programmatic BO. After reviewing the size and scope of the project, the environmental baseline, the status of Indiana bat, and its potential occurrence within the project area, the effects of the action; and any cumulative effects, **it is the Service’s biological opinion that this action is not likely to jeopardize the continued existence of the Indiana bat.**

Incidental Take Statement

The Service anticipates that the proposed actions associated with the East Fork Huzzah Project will result in the incidental take of Indiana bat habitat as outlined in Table 3. The type and amount of anticipated incidental take is consistent with that described in the Programmatic BO and does not cause the total annual level of incidental take in the Programmatic BO (page 67-69) to be exceeded.

The Forest Service must implement all pertinent reasonable and prudent measures and implementing terms and conditions stipulated in the Programmatic BO to minimize the impact of the anticipated incidental take of Indiana bats, and to be exempt from the take prohibitions of section 9 of the Act. We have determined that no new reasonable and prudent measures, beyond those specified in the Programmatic BO, are needed to minimize the impact of incidental take anticipated for the East Fork Huzzah Project.

This fulfills your consultation requirements for this action. Should the proposed project be modified or if the level of take identified above is exceeded, reinitiation of consultation as outlined in 50 CFR 402.16, is required.

³ Includes 3.8 miles of constructed fire line and 1.4 miles of existing roads, trails, and natural barriers used as fire line.

Table 3. Anticipated incidental take associated with the East Fork Huzzah Project.

Activity	Maximum Level of Annual Incidental Take (per the 2005 Programmatic BO)	Anticipated Incidental Take from the East Fork Huzzah Project					Total Anticipated Take within the MTNF (includes currently planned projects)			
		FY15	FY16	FY17	FY18	Total	FY15	FY16	FY17	FY18
Salvage Timber Harvest	15,000 acres	0 ac	1,000 ac	1,000 ac	1,176 ac	3,176 ac	1,796 ac	2,807 ac	2,148 ac	2,148 ac
Hazard Tree Removal – fire line construction	240 miles	0 mi	0 mi	5.2 mi	0 mi	5.2 mi	18 mi	15 mi	29 mi	4.7 mi
Hazard Tree Removal – skid trails, log landings, and temporary roads	800 acres	0 ac	35 ac	35 ac	48 ac	118 ac	119 ac	35 ac	35 ac	48 ac
Road Construction/reconstruction	100 acres	0 ac	5 ac	5 ac	5.76	15.76 ac	52.2 ac	69.8 ac	24.7 ac	6.3 ac

BIOLOGICAL OPINION

Effects to the
Northern Long-eared Bat
from the
East Fork Huzzah Project

Prepared by:
U.S. Fish and Wildlife Service
Columbia Missouri Ecological Services

August 7, 2015

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO) based on our review of the proposed Mark Twain National Forest (MTNF) East Fork Huzzah Project in Crawford, Dent, and Iron counties in Missouri. This BO evaluates the potential effects of implementation of the various activities associated with the project on the northern long-eared bat (*Myotis septentrionalis*)(NLEB) in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Effects to other federally listed species have been evaluated in the preceding BO tiered to the 2005 Programmatic BO for the MTNF 2005 Forest Plan, as amended in 2009 and 2014 (Forest Plan)(U.S. Forest Service 2005).

CONSULTATION/CONFERENCE HISTORY

The MTNF's initial request for concurrence was received on February 13, 2015, along with the Biological Assessment/Evaluation (BAE). In response to the April 2, 2015 publication of the final listing rule for the NLEB (U.S. Fish and Wildlife Service 2015a), the MTNF revised the BAE and changed the determination for the NLEB from "not likely to jeopardize the continued existence of the species" to "may affect, and likely to adversely affect". The revised BAE was received by the Service on April 13, 2015. Following a telephone call with Theresa Davidson on July 9, 2015, the Service received on the same day an email from Sarah Bradley stating that no prescribed burns would be conducted during June or July in order to avoid impacts to NLEB pups that are non-volant (i.e., not able to fly). On July 23, 2015, the Service provided the draft BO to Sarah Bradley to review, and comments on the draft were received on July 28, 2015.

The MTNF also initiated formal consultation with the Service on March 13, 2015 for 83 other ongoing and continuing projects. Because the Biological Assessment/Evaluation (BAE) for the East Fork Huzzah Project was submitted to the Service prior to initiation of this larger consultation, effects from the project have been evaluated separately.

This BO is based on information provided in the BAE, email correspondence and phone conversations with MTNF Biologist Sarah Bradley, the final rule to list the northern long-eared bat as threatened with the interim 4(d) rule (U.S. Fish and Wildlife Service 2015a), and other sources of information available to us and/or in our files. The Service has determined that implementation of the management strategies described in the BAE will not jeopardize the continued existence of the NLEB but will likely result in incidental take of the species.

Interim 4(d) Rule for the NLEB

On April 2, 2015, the Service published an interim rule pursuant to section 4(d) of the ESA for NLEB (U.S. Fish and Wildlife Service 2015a). The interim rule exempts take of the NLEB from the section 9 prohibitions of the ESA for activities meeting certain conditions and complying with specific conservation measures. These conditions and conservation measures are outlined in more detail under the section **INCIDENTAL TAKE STATEMENT**. We have determined that all activities associated with the East Fork Huzzah Project meet the applicable conditions and comply with the conservation measures. Thus, any take of NLEB occurring in conjunction

with these activities is exempted from section 9 prohibitions and does not require incidental take authorization.

A complete administrative record of this consultation is on file at the Service's Columbia Missouri Ecological Services Field Office.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The East Fork Huzzah Project area consists of approximately 20,819 acres (ac) in the north central portion of the Salem Ranger District (Fig. 1). The area lies within the Meramec River Hills subsection of the Ozark Highlands State Natural Division, and Huzzah Creek is the main watershed in the project area.

Within this area, the Salem District is proposing to conduct various silvicultural treatments within the East Fork Huzzah Project area to improve forest health and provide wildlife habitat diversity. The project will include a combination of commercial salvage harvest and post-harvest, non-commercial treatments for reforestation and stand improvement for enhancing open woodland conditions and reducing hazardous fuel loads caused by oak mortality. The proposed action will also include other activities aimed at improving and enhancing the forest transportation system, soil and watershed health, and wildlife habitat in the project area. A list of proposed activities and affected area is provided in Table 1, followed by a description of each activity as provided in the BAE.

1) Silvicultural Treatments for Forest Health Improvement and Ecosystem Enhancement

Clearcutting with Reserves- The proposed action includes approximately **284 acres** of clearcut treatments. Clearcutting with reserves is the cutting of essentially all trees except for reserve trees, producing a fully exposed microclimate for the development of a new age class. Regeneration can be from natural seeding, direct seeding, planted seedlings, or advance reproduction. Varying numbers of reserve trees are retained to attain goals other than regeneration. Dead trees and "wildlife trees" (hollow or defective trees that do not have a merchantable product) will be left.

Seed tree with Reserves - Approximately **95 acres** of seed tree with reserves harvest is planned for the analysis area. Seed tree with reserves is cutting all trees except for a small number of widely dispersed trees retained for seed production, and to produce a new age class in a fully exposed microenvironment. Some of the seed trees or other reserve trees are retained after regeneration has become established to gain goals other than regeneration. Dead trees and "wildlife trees" (hollow or defective trees that do not have a merchantable product) will be left.

Shelterwood with Reserves - Approximately **559 acres** of shelterwood with reserves harvest treatments are proposed for the analysis area. Shelterwood with reserves is the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment. The sequence of cutting can include three types of cuttings: (a) an optional preparatory cut to enhance conditions for seed production, (b) an establishment cut to prepare the seed bed and create a new age class, and (c) a removal cut to release established regeneration from competition with the overstory. Some of the shelterwood trees or other reserve trees are retained after regeneration has become established to attain goals other than regeneration. Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Salvage - Approximately **3,176 acres** of salvage with reserves harvest is planned for the analysis area. Salvage cuts will harvest the stands with the worst mortality conditions of affected oaks. The objective is to remove dead and dying merchantable material which can still provide a product. Any group of remaining quality trees will be given more room and sunlight to promote their growth and provide larger trees more quickly. Canopy gaps will provide sunlight, which will then reach the forest floor and enhance the advanced regeneration of the shade intolerant species. Opening up the stands will also maintain or encourage a forage component by allowing light to reach the ground. Dead and dying trees that do not have a merchantable product will be left.

Thinning - Approximately **898 acres** of thinning harvest is planned for the analysis area. Commercial thinning is an intermediate treatment that reduces basal area by cutting and removing trees by means of a commercial timber sale. The treatments may be made to improve growth, enhance forest health, obtain advanced regeneration, or move the stand toward its natural community type. Treatment would occur in predominantly immature, smaller diameter pine and pine-oak stands that have basal areas greater than 130. This treatment would improve growth and wind-firmness of residual trees, improve canopy openness and begin development of ground flora (grasses and forbs). Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Natural Regeneration - This proposal includes approximately **4,066 acres** of natural regeneration. After the completion of harvest activities, suppressed, damaged, and undesirable trees would be cut to provide and encourage regeneration. Dead trees and “wildlife trees” (hollow or defective trees that do not have a merchantable product) will be left.

Pine Planting - Pine planting is proposed as the regeneration method for **284 acres**. Initiating pine growth in stands containing high percentages of black oak and scarlet oak increases species richness on the site and will improve tree species composition and stand vigor.

Crop Tree Release - Approximately **1,405 acres** of crop tree release are planned for the project area. Crop tree release is a treatment to free young trees from undesirable competition (usually overtopping), and can be used to improve the composition, structure, condition,

health, and growth of a stand. Release treatments are made no later than 10 years of age in shortleaf pine stands and no later than 15 years of age in hardwood and hardwood-pine stands.

2) Treatments to Enhance Wildlife Habitat

Prescribed Burning - Approximately **189 acres** of prescribed burning are proposed on three separate units in the analysis area: Beefsteak Fields (64 acres), Beefsteak North (26 acres), and Huzzah East (99 acres). These three units have been burned on several occasions previously in other projects. In this case, prescribed fire is used to open the understory, enhance the growth and diversity of grasses and forbs, reduce leaf litter, and control woody species. Connected actions include the construction of fire lines with dozer, leaf blower, and/or rake. Natural features (e.g., creeks) and manmade features (e.g., roads, trails) could be used as fire lines as well.

Mowing - Approximately **229 acres** of mowing are proposed in the analysis area. In this treatment, a rotary cutter (bush hog) pulled behind a wheeled farm tractor is used to cut brush, tall grass, forbs, and small trees. This controls the competing woody species and accelerates desirable grass and forb to growth.

Disking - Approximately **111 acres** of disking are proposed in the analysis area. For this treatment, a farm disk pulled behind a wheeled farm tractor is used to turn the soil, pulverize it, and kill vegetation. This is done to kill undesirable vegetation and prepare the soil to plant seeds of desirable grasses and forbs to enhance openings and habitat for open land wildlife species.

Seeding - Approximately **111 acres** of seeding are proposed in the analysis area. For this treatment, a broadcast seeder or drill is used to plant seeds of desirable grasses and forbs in openings that have been prepared by disking. It also includes broadcast seed where the soil has not been disking (overseeding).

Hand-cutting - Approximately **14 acres** of hand-cutting are proposed in the analysis area. For this treatment, chainsaws are used to cut woody species (small trees) that are too big for a rotary cutter to mow. The stems may be left to lie where cut, piled by hand, or with a tractor or dozer.

Planting - Approximately **77 acres** of planting are proposed in the analysis area. For this treatment, hand tools (shovel, hoe) would be used to plant tree seedlings. This would be done in openings and open bottomlands to help stabilize stream banks, soil, and to re-establish forests in cleared areas.

Pond Rehabilitation - **17 ponds** are proposed for rehabilitation in the analysis area. This involves the rehabilitation of existing small wildlife ponds that are usually fishless and less than 1/10th of an acre in size. These ponds provide habitat for reptiles, amphibians, and insects as well as a water source for other wildlife species such as bats. Many of these ponds were built in the 1960's and have filled with sediment and vegetation, making them less suitable for wildlife. The rehabilitation would include cutting woody vegetation from the

pond dams and the use of heavy equipment to breach the pond dam to drain the pond. An excavator or dozer would be used to remove vegetation and sediment. The dam would be repaired and the pond allowed to fill with water naturally (rain, run-off).

Spring/Fen Restoration - 8 acres are proposed for spring/fen restoration in the analysis area. This involves the restoration of springs that have been dammed into ponds. The dam(s) would be breached with heavy equipment (dozer, excavator) and the spring branch restored natural flow to the maximum extent possible. Heavy equipment could also be used to restore the spring branch channel if needed. It also involves using a chainsaw to cut woody shrubs and trees in a fen near Barney Creek. The work would be done when the ground is frozen and the cut shrubs and trees would be dragged by hand from the fen.

Vernal Pool Construction - 4 areas are proposed for vernal pool construction in the analysis area. This involves the use of heavy equipment (dozer, excavator) to construct small, ephemeral, pools. These pools would be shallow, seasonal, temporary wetlands. They periodically dry up in late summer or fall and do not contain fish. Vernal pools provide breeding habitat for amphibians and invertebrates and a water source for many species of wildlife.

Old Growth Designation - Approximately 889 acres in the analysis area are proposed for old growth designation. For Management Prescription 2.1, the forest plan recommends that areas exhibiting old growth characteristics comprise 8% to 12% of the management area (Forest Plan, 3-11). The designations in this proposal will move the analysis area towards this desired condition.

3) Treatments to Improve Soil and Watershed Health

Trash Dump Removal - There are **19 illegal dump areas** in the analysis area that are proposed for clean-up. These illegal dumps present a potential watershed concern that could impact surface and subsurface water quality and which could impact various wildlife species. In addition, they present a concern to public health and safety.

Barney Creek Stream Bank Stabilization - Approximately **1.5 miles** of stream bank along Barney Creek in the analysis area are proposed for stabilization. Barney Creek is an upper tributary stream to the Huzzah Creek and part of the headwaters of the Meramec River. There is interest in working in the headwaters of the Meramec drainage to help reduce sediment and gravel loads to the main stem and to improve headwaters habitat for aquatic organisms. This will also help to improve habitat in the drainage for mussel species and for their host fish species. Sections of Barney Creek are too wide and shallow to support pool development for aquatic habitat or the stream is entrenched as a gully causing an additional sediment load to enter the stream from steeply eroding stream banks. Loss of riparian vegetation has contributed to bank destabilization and sedimentation of the creek. Large woody material (LWM) will be placed to improve stream morphology and aquatic habitat. Stream Channel Restoration will occur in areas where the placement of large woody material would not improve stream morphology and aquatic habitat. Hardwood tree seedlings will be planted in open bottomlands along Barney Creek to help restore bottomland hardwood forest and stabilize creek banks.

4) Transportation System Management

There are approximately 17.1 miles of National Forest System road within the East Fork Huzzah Project area. National Forest System roads are under the jurisdiction of the Forest Service and determined to be needed for long-term motorized access. Non-system roads are roads on NFS lands that are not managed as part of the Mark Twain National Forest Transportation System. There are approximately 15.7 miles of non-system roads in the analysis area. Examples of non-system roads are, but not limited to, user-created roads or trails and abandoned travel ways. Non-system roads are considered part of the general forest area and motorized travel off of system roads and designated motorized trails into the general forest area is prohibited.

Approximately 6.5 miles of National Forest System roads have been identified for reconstruction. The conditions of these roads have deteriorated over time and currently do not meet Forest Service engineering standards. Road reconstruction consists of improvements to the original surface material and constructing drainage features. In some cases, realignment of the road may be necessary. Approximately 7.9 miles of National Forest System roads have been identified for maintenance. Road maintenance would consist of the on-going upkeep of a road, necessary to retain or restore the road to the approved road management objective. Activities associated with road maintenance may include surface blading, replacement of surface material, mowing and limbing of roadside vegetation, cleaning and restoring drainage features, and replacing road signs. In addition, there is approximately 0.4 miles of system road for which the Forest Service is seeking to transfer an easement to Crawford County. If there is no easement transfer, a special use permit will be issued to the adjacent private landowner. Approximately 1.1 miles of additional system road will be converted to non-system road and a special use permit will be issued to the landowner.

Approximately 1.2 miles of National Forest System roads and 13.56 miles of non-system roads have been identified for decommissioning. The remaining 2.14 miles of non-system roads are currently under special use permits for adjacent landowners and would not be decommissioned. Road decommissioning would result in the stabilization and restoration of unneeded roads to a more natural state. Decommissioning activities include blocking access with earthen or rock berms, boulders, or slash piles, recontouring, and revegetation by seeding, planting, and fertilizing.

Connected Actions - Vegetation and road management activities cited above also include actions that are connected and necessary for implementation. These connected actions include approximately 19 miles of temporary road for timber sale access, 83 acres of skid trails and log lands, and approximately 5.2 miles of fire line required to safely implement the planned prescribe burns in this project. This includes approximately 3.7 miles of dozer-line and 0.1 mile of hand-line. The remaining 1.4 miles of fire line consists of existing roads and natural barriers.

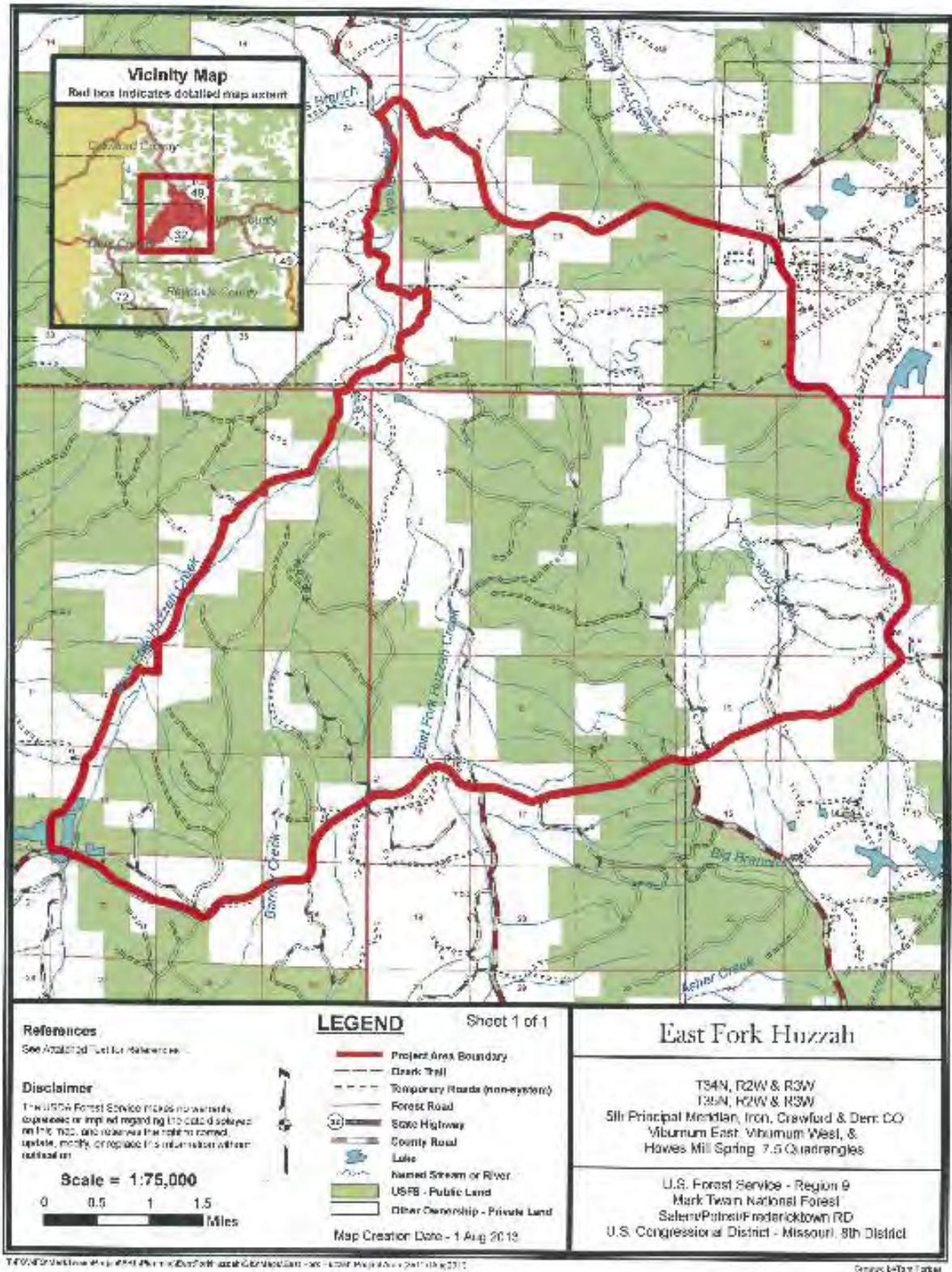


Figure 1. East Fork Huzzah Project Area (map courtesy of the MTNF).

Table 1. Summary of activities associated with the proposed East Fork Huzzah Project.

Proposed Activities	Measures (Estimated)
Forest Health and Ecosystem Enhancement	
Clearcutting with Reserves	284 acres
Seed Tree with Reserves	95 acres
Shelterwood with Reserves	559 acres
Salvage	3,176 acres
Thinning	898 acres
Natural Regeneration	4,066 acres
Pine Planting	284 acres
Crop Tree Release	1,405 acres
Wildlife Habitat Enhancements	
Prescribed Fire Treatments	189 acres
Mowing	229 acres
Disking	111 acres
Seeding	111 acres
Hand-cutting	14 acres
Planting	77 acres
Pond Rehabilitation	17 ponds
Spring/Fen Rehabilitation	8 acres
Vernal Pool Construction	4 areas
Old Growth Designation	889 acres
Soil and Watershed Health Improvements	
Trash Dump Removal	19 dump sites
Barney Creek Stream Bank Stabilization	1.5 miles
Transportation System Actions	
Road Reconstruction	6.5 miles
Road Maintenance	7.9 miles
Pursue County Easement	0.4miles
Convert System Road to Non-system Road	1.1 miles
Decommission System Roads	2.7 miles
Decommission Non-system Roads	13.56 miles
Connected Actions	
Temporary Road Construction	19 miles
Skid Trails and Log Landings	83 acres
Fire Line Construction (dozer and handline)	3.8 miles
Existing Roads, Trails, and Natural Barriers Used as Fire Lines	1.4 miles

Conservation Measures

Conservation measures represent actions outlined in the project description that the action agency will implement to further the recovery of the species under review. Conservation measures implemented to minimize harm to listed species which are proposed by the action agency are considered part of the project and their implementation is required under the terms of this consultation.

Following formal consultation with the Service and the issuance of the 2005 Programmatic Biological Opinion, the Forest Service amended their land resource management plan to incorporate multiple conservation measures that would benefit bats not currently listed under the ESA, as well as the gray bat and Indiana bat (U.S. Forest Service 2014). Many of these measures include proactive actions to benefit hibernacula and summer habitat and they will benefit the NLEB. Measures relevant to the East Fork Huzzah Project include:

- Maintain trees with characteristics of suitable roosts (i.e., dead or dying with exfoliating bark or large living trees with flaking bark) wherever possible with regard for public safety and accomplishment of overall resource goals and objectives.
- Identify and remove hazard trees between November 1 and April 1 whenever possible.
- Using the current, accepted technology, determine the location of summer roost trees and foraging areas for female bats.
- Prohibit removal of suitable roost trees and prescribed burning within the 20 acres of old growth and 130 acres of forest or mature woodland surrounding a threatened, endangered, candidate, proposed, or rare species of bat hibernacula during the swarming and staging periods. Determine dates individually for each cave (normally between September 1 and November 1 and between March 15 and April 30 respectively.)
- The area around occupied bat caves is a smoke-sensitive area. Develop prescribed burn plans to avoid or minimize smoke influences at or near these caves.

In addition, the following conservation measures will be implemented within the Indiana bat Area of Use and will benefit the NLEB:

- Management activities will occur during the hibernation period (November 1 to April 1).
- Thinning will have a target residual basal area of no less than 50 to help enhance potential foraging habitat.
- Reserve areas for seed tree, shelterwood and clearcut harvests will be left along drainages where possible to help provide connectivity and forested travel ways.
- At least 10 % of dead and dying trees will be left in salvage harvest units so some potential roost trees are available within salvage units.

Lastly, as indicated in a July 9, 2015 email from Sarah Bradley, no prescribed burning will be conducted within the East Fork Huzzah Project area during June and July when NLEB pups are non-volant (not able to fly).

Action Area

The Action Area includes all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action (50 Code of Federal Regulations [CFR] 402.02). The Action Area is defined by measurable or detectable changes in land, air, and water or to other measurable factors that would result from the proposed action. The Action Area is not limited to the “footprint” of the project but rather encompasses the aerial extent of the biotic, chemical, and physical impacts to the environment resulting from the action.

The action area for the East Fork Huzzah Project as defined by the MTNF in the BAE includes two twelve-digit hydrologic units – Crooked Creek and Headwaters Huzzah. This delineation includes all of the treatment areas and was selected, in part, due to considerations relating to other species.

STATUS OF THE SPECIES

This section provides an overview of the biology and conservation needs of the NLEB that are pertinent to the “Effects of the Action” section (e.g., description of the annual life cycle, spring emergence habitat, fall swarming habitat, etc.). Additional information on the NLEB life history, biology, current range-wide population and trends, and threats are thoroughly described in the final listing rule (U.S. Fish and Wildlife Service 2015a).

Life History and Biology

The NLEB is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spends summers in wooded areas. The key stages in its annual cycle are: hibernation, spring staging and migration, pregnancy, lactation, volancy/weaning, fall migration and swarming. NLEB generally hibernate between mid-fall through mid-spring each year. Spring migration period likely runs from mid-March to mid-May each year, as females depart shortly after emerging from hibernation and are pregnant when they reach their summer area. Young are born between mid-June and early July, with nursing continuing until weaning, which is shortly after young become volant in mid- to late-July. Fall migration likely occurs between mid-August and mid-October.

Summer habitat and ecology - Suitable summer habitat⁴ for NLEB consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

⁴ See the Service’s current summer survey guidance for our latest definitions of suitable habitat.

Many species of bats, including the NLEB, consistently avoid foraging in or crossing large open areas, choosing instead to use tree-lined pathways or small openings (Patriquin and Barclay 2003, Yates and Muzika 2006). Further, wing morphology of the species suggests that they are adapted to moving in cluttered habitats. Thus, isolated patches of forest may not be suitable for foraging or roosting unless the patches are connected by a wooded corridor.

Upon emergence from the hibernacula in the spring, females seek suitable habitat for maternity colonies. NLEB actively form colonies in the summer (Foster and Kurta 1999) and exhibit fission-fusion behavior (Garroway and Broders 2007), where members frequently coalesce to form a group (fusion), but composition of the group is in flux, with individuals frequently departing to be solitary or to form smaller groups (fission) before returning to the main unit (Barclay and Kurta 2007). As part of this behavior, northern long-eared bats switch tree roosts often (Sasse and Pekins 1996), typically every 2 to 3 days (Foster and Kurta 1999; Owen et al. 2002; Carter and Feldhamer 2005; Timpone et al. 2010). NLEB maternity colonies range widely in size, although 30-60 may be most common (U.S. Fish and Wildlife 2014). NLEB show some degree of interannual fidelity to single roost trees and/or maternity areas. Male NLEB are routinely found with females in maternity colonies. NLEB use networks of roost trees often centered around one or more central-node roost trees (Johnson et al. 2012). NLEB roost networks also include multiple alternate roost trees and male and non-reproductive female NLEB may also roost in cooler places, like caves and mines (Barbour and Davis 1969, Amelon and Burhans 2006).

NLEB roost in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically ≥ 3 inches dbh). NLEB are known to use a wide variety of roost types, using tree species based on presence of cavities or crevices or presence of peeling bark. NLEB have also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable).

Young NLEB are typically born in late-May or early June, with females giving birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups becoming volant (able to fly) between early July and early August.

Migration - Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat some distance from their hibernaculum. NLEB is not considered to be a long distance migrant (typically 40-50 miles). Migration is an energetically demanding behavior for the NLEB, particularly in the spring when their fat reserves and food supplies are low and females are pregnant.

Winter habitat and ecology - Suitable winter habitat (hibernacula) includes underground caves and cave-like structures (e.g. abandoned or active mines, railroad tunnels). There may be other landscape features being used by NLEB during the winter that have yet to be documented. Generally, NLEB hibernate from October to April depending on local climate (November-December to March in southern areas and as late as mid-May in some northern areas).

Hibernacula for NLEB typically have significant cracks and crevices for roosting; relatively constant, cool temperatures (0-9 degrees Celsius) and with high humidity and minimal air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

NLEB tend to roost singly or in small groups (U.S. Fish and Wildlife Service 2014), with hibernating population sizes ranging from a just few individuals to around 1,000 (U.S. Fish and Wildlife Service unpublished data). NLEB display more winter activity than other cave species, with individuals often moving between hibernacula throughout the winter (Griffin 1940, Whitaker and Rissler 1992, Caceres and Barclay 2000). NLEB have shown a high degree of philopatry to the hibernacula used, returning to the same hibernacula annually.

Spring Staging and Fall Swarming habitat and ecology - Upon arrival at hibernacula in mid-August to mid-November, NLEB “swarm,” a behavior in which large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in caves during the day. Swarming continues for several weeks and mating occurs during the latter part of the period. After mating, females enter directly into hibernation but not necessarily at the same hibernaculum as they had been mating at. A majority of bats of both sexes hibernate by the end of November (by mid-October in northern areas).

After hibernation ends in late March or early April (as late as May in some northern areas), most NLEB migrate to summer roosts. Females emerge from hibernation prior to males. Reproductively active females store sperm from autumn copulations through winter. Ovulation takes place after the bats emerge from hibernation in spring. The period after hibernation and just before spring migration is typically referred to as “staging,” a time when bats forage and a limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day.

In general, NLEB use roosts in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat consists of the variety of forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum. This includes forested patches as well as linear features such as fencerows, riparian forests and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow.

Threats

No other threat is as severe and immediate for the NLEB as the disease white-nose syndrome (WNS). It is unlikely that NLEB populations would be declining so dramatically without the impact of WNS. Since the disease was first observed in New York in 2007 (later biologists found evidence from 2006 photographs), WNS has spread rapidly in bat populations from the Northeast to the Midwest and the Southeast. Population numbers of NLEB have declined by 99 percent in the Northeast, which along with Canada, has been considered the core of the species’

range. Although there is uncertainty about how quickly WNS will spread through the remaining portions of these species' ranges, it is expected to spread throughout their entire ranges. In general, the Service believes that WNS has significantly reduced the redundancy and resiliency of the NLEB.

Although significant NLEB population declines have only been documented due to the spread of WNS, other sources of mortality could further diminish the species' ability to persist as it experiences ongoing dramatic declines. Specifically, declines due to WNS have significantly reduced the number and size of NLEB populations in some areas of its range. This has reduced these populations to the extent that they may be increasingly vulnerable to other stressors that they may have previously had the ability to withstand. These impacts could potentially be seen on two levels. First, individual NLEB sickened or struggling with infection by WNS may be less able to survive other stressors. Second, NLEB populations impacted by WNS, with smaller numbers and reduced fitness among individuals, may be less able to recover making them more prone to extirpation. The status and potential for these impacts will vary across the range of the species.

Bats affected but not killed by WNS during hibernation may be weakened by the effects of the disease and may have extremely reduced fat reserves and damaged wing membranes. These effects may reduce their capability to fly or to survive long-distance migrations to summer roosting or maternity areas.

In areas where WNS is present, there are additional energetic demands for northern long-eared bats. For example, WNS-affected bats have less fat reserves than non-WNS-affected bats when they emerge from hibernation (Reeder et al. 2012; Warnecke et al. 2012) and have wing damage (Meteyer et al. 2009; Reichard and Kunz 2009) that makes migration and foraging more challenging. Females that survive the migration to their summer habitat must partition energy resources between foraging, keeping warm, successful pregnancy and pup-rearing, and healing and may experience reduced reproductive success. In addition, with wing damage, there may be an increased chance of WNS-affected bats being killed or harmed as a result of proposed action. Again, this is particularly likely if timber harvest or burns are conducted early in the spring (April – May) when bats have just returned, have damaged wings, and are exposed to colder temperatures when torpor is used more frequently.

Over the long-term, sustainable forestry benefits NLEB by maintaining suitable habitat across a mosaic of forest treatments. However, forest practices can have a variety of impacts on the NLEB depending on the quality, amount, and location of the lost habitat, and the time of year of clearing. Depending on their characteristics and location, forested areas can function as summer maternity habitat, staging and swarming habitat, migration or foraging habitat, or sometimes, combinations of more than one habitat type. Impacts from tree removal to individuals or colonies would be expected to range from indirect impact (e.g., minor amounts of forest removal in areas outside NLEB summer home ranges or away from hibernacula) to minor (e.g., largely forested areas, areas with robust NLEB populations) to significant (e.g., removal of a large percentage of summer home range, highly fragmented landscapes, areas with WNS impacts).

Lastly, there is growing concern that bats, including the NLEB (and other bat species) may be threatened by the recent surge in construction and operation of wind turbines across the species' range. Mortality of NLEB has been documented at multiple operating wind turbines/farms. The Service is now working with wind farm operators to avoid and minimize incidental take of bats and assess the magnitude of the threat.

Rangewide Status

The NLEB ranges across much of the eastern and north central United States, and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia (Nagorsen and Brigham 1993; Caceres and Pybus 1997; Environment Yukon 2011)(Fig. 2). In the United States, the species' range reaches from Maine west to Montana, south to eastern Kansas, eastern Oklahoma, Arkansas, and east through the Gulf States to the Atlantic Coast (Whitaker and Hamilton 1998; Caceres and Barclay 2000; Amelon and Burhans 2006). The species' range includes the following 37 States (plus the District of Columbia): Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Historically, the species has been most frequently observed in the northeastern United States and in Canadian Provinces, Quebec and Ontario, with sightings increasing during swarming and hibernation (Caceres and Barclay 2000). However, throughout the majority of the species' range it is patchily distributed, and historically was less common in the southern and western portions of the range than in the northern portion of the range (Amelon and Burhans 2006).

Northern Long-Eared Bat (*Myotis septentrionalis*) Range

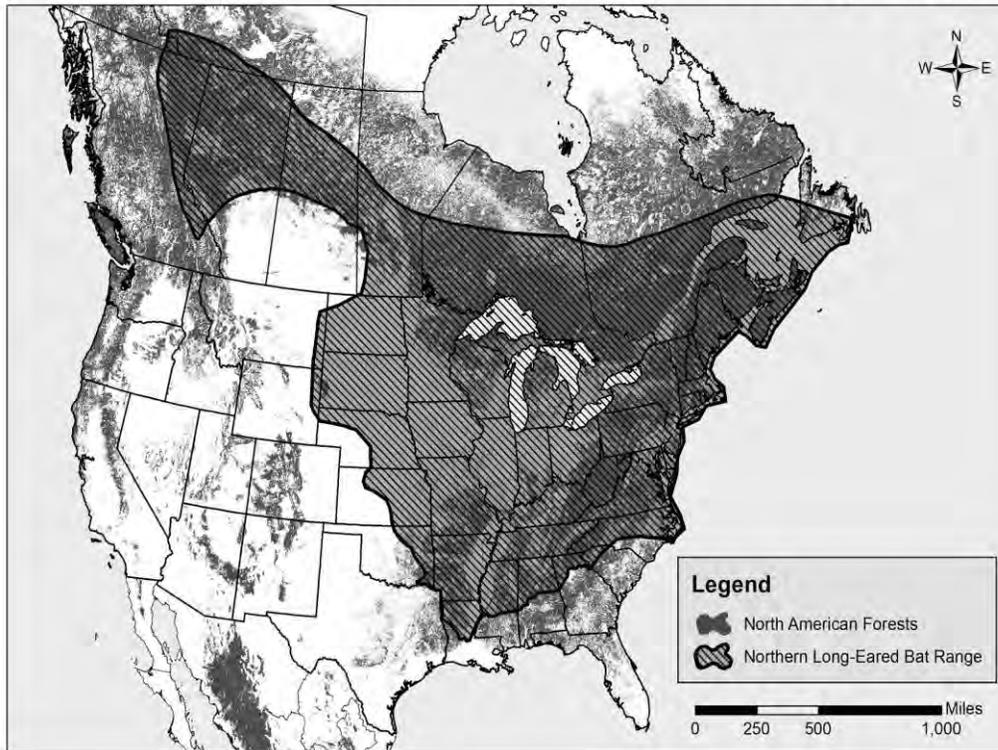


Figure 2. Northern long-eared bat range.

Although they are typically found in low numbers in inconspicuous roosts, most records of NLEB are from winter hibernacula surveys (Caceres and Pybus 1997). More than 780 hibernacula have been identified throughout the species' range in the United States, although many hibernacula contain only a few (1 to 3) individuals (Whitaker and Hamilton 1998). Known hibernacula (sites with one or more winter records of northern long-eared bats) include: Alabama (2), Arkansas (41), Connecticut (8), Delaware (2), Georgia (3), Illinois (21), Indiana (25), Kentucky (119), Maine (3), Maryland (8), Massachusetts (7), Michigan (103), Minnesota (11), Missouri (more than 269), Nebraska (2), New Hampshire (11), New Jersey (7), New York (90), North Carolina (22), Oklahoma (9), Ohio (7), Pennsylvania (112), South Carolina (2), South Dakota (21), Tennessee (58), Vermont (16), Virginia (8), West Virginia (104), and Wisconsin (67). NLEB are documented in hibernacula in 29 of the 37 States in the species' range. Other States within the species' range have no known hibernacula (due to no suitable hibernacula present, lack of survey effort, or existence of unknown retreats).

The current range and distribution of NLEB must be described and understood within the context of the impacts of WNS. Prior to the onset of WNS, the best available information on NLEB came primarily from surveys (primarily focused on Indiana bat or other bat species) and some targeted research projects. In these efforts, NLEB was very frequently encountered and was considered the most common myotid bat in many areas. Overall, the species was considered to be widespread and abundant throughout its historic range (Caceres and Barclay 2000).

WNS has been particularly devastating for NLEB in the northeast, where the species was believed to be the most abundant. There are data supporting substantial declines in NLEB populations in portions of the Midwest due to WNS. In addition, WNS has been documented at more than 100 NLEB hibernacula in the southeast, with apparent population declines at most sites. WNS has not been found in any of the western states to date and the species is considered rarer in the western extremes of its range. We expect further declines as the disease continues to spread across the species' range.

Conservation Needs of the Species

The species' conservation needs define what is needed in terms of reproduction, numbers, and distribution to ensure the species is no longer in danger of extinction. The conservation needs should be defined in the species' recovery outline or plan. Since there is no recovery plan or recovery outline available at this time, we will outline the conservation needs based on our current understanding of the species.

We find that the primary conservation need of the NLEB is to reduce the threat of WNS. This includes minimizing mortality in WNS-affected areas, and slowing the rate of spread into currently unaffected areas. In addition, NLEB that continue to exist within WNS-affected areas need to be able to continue to survive and reproduce in order to stabilize and/or increase the populations. This can be done by reducing the other threats to the species, as listed above. Therefore, efforts to protect hibernacula from disturbances need to continue. This should include restricting human access to hibernacula particularly during the hibernation period, constructing and maintaining appropriately designed gates, and restoring microhabitat conditions in hibernacula that have been altered. Efforts should also be made to protect and restore (in some cases) adequate fall swarming habitat around hibernacula. Known maternity habitat should be maintained, and the removal of known roost trees, particularly when pregnant females and/or young are present, should be reduced. Research to identify important hibernacula and summer areas and to delineate the migratory relationship between summering and wintering populations should also be pursued.

ENVIRONMENTAL BASELINE

The Environmental Baseline describes the species status and trend information, and analyzes the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and the ecosystem within the action area. Additional detailed information is available in the Forest Plan that is hereby incorporated by reference.

Status of the Northern Long-eared Bat in Missouri

Missouri records indicate that the NLEB hibernates mostly in the eastern and central Ozarks. However, they are widespread and have been recorded in approximately 270 hibernacula throughout the state. Hibernating individuals have been found in Missouri as far southwest as McDonald County and as far northeast as Marion County (Missouri Department of Conservation unpublished data). It is presumed that the NLEB occurs throughout most of Missouri during the

summer. Mist net captures of the species have been reported from counties at or near all four corners of the state (Newton, Nodaway, Clark, and Cape Girardeau counties).

Status of the Northern Long-eared Bat in the Project Area

The NLEB has been captured during mist netting efforts on every Ranger District on the MTNF, including the Salem Ranger District. The most recent captures occurred during mist netting surveys in 2013 and 2014, with reproductive females, males and juveniles captured. According to information in the BAE, these NLEBs were captured within road/trail corridors and around waterholes and road ruts in upland forested areas near or on ridgetops. However, none of the individuals were equipped with transmitters, so no maternity roost trees were identified.

Conservation Needs of the Species in the Action Area

The conservation needs of the species in the action area are similar to the needs rangewide. The MTNF provides habitat for swarming, hibernating, migrating, and summering NLEBs, and NLEB individuals on the MTNF have already been affected by WNS. Therefore, within the action area the conservation needs include: 1) reducing WNS-related mortality and injury; 2) maintaining suitable conditions within hibernacula and protecting them from disturbance; 3) providing suitable habitat conditions for NLEB swarming, foraging, and roosting; 4) maintaining suitable habitat conditions in identified maternity areas and reducing the removal of roost trees; 5) searching for previously unidentified areas of maternity and hibernation activity; and 6) conducting research to understand the migration patterns of NLEB that use the area during the summer or winter.

EFFECTS OF THE ACTION

Several of the activities associated with the East Fork Huzzah Project are not anticipated to impact the northern NLEB. However, activities identified in Table 2 have the potential to result in direct and indirect effects to the species. Direct effects occur when bats are present while the activities are being conducted; indirect effects occur later in time. As noted under **Conservation Measures**, impacts will be minimized by restricting hazard tree removal to the period between November 1 and April 1 whenever possible, and prescribed burning will be avoided during June and July to avoid impacting non-volant pups.

Table 2. Proposed activities having the potential to impact the northern long-eared bat.

Proposed Activities	Project Area
Salvage harvest	3,176 acres
Hazard tree removal – fire line construction	5.2 miles ⁵
Hazard tree removal - skid trails, log landings, and temporary roads	118 acres
Road reconstruction	15.76 acres
Prescribed fire treatments	189
Total	5.2 miles 3,498.76 acres

Direct and Indirect Effects

Potential effects to NLEBs from timber harvest, prescribed burning (where potentially suitable roost trees may burn), and activities involving tree removal are discussed below. A more thorough analysis of these activities can be found in the Service’s 2015 BO evaluating effects to the NLEB from 83 other ongoing and continuing projects (U.S. Fish and Wildlife Service 2015b).

Effects to Hibernating Bats and Hibernacula - No effects are anticipated to wintering NLEB or their hibernacula from the proposed action because the nearest NLEB hibernaculum is approximately 4 miles from the project area⁶. Conservation measures will be implemented to minimize the potential that smoke from prescribed burns does not settle heavily in areas containing caves known to be occupied by NLEBs or Indiana bats (protecting caves occupied by Indiana bats will also help protect undetected NLEBs).

Effects to Bats during Spring Staging, Migration and Fall Swarming- Northern long-eared bats could be impacted by activities involving tree removal (e.g., salvage harvest, hazard tree removal, and road construction) if trees occupied by roosting bats are cut when in use. While most bats can flee during tree removal, removal of occupied roosts may result in direct injury or mortality to some percentage of bats. This is particularly likely during cool spring months when bats enter torpor (temporary unresponsive state) to survive cool weather and low prey availability. Bats could also abandon roost sites due to disturbance created by activities associated with management treatments.

Although it’s stated in the 2005 Programmatic BO that Indiana bats are not likely to be adversely affected by prescribed burning, NLEB are more widespread and occur in higher densities than Indiana bats within the MTNF districts. Thus, the Service does not consider the likelihood of take as insignificant and discountable and has determined that NLEBs could also be impacted by prescribed burning if roosting trees are occupied by bats during burning.

⁵ Includes 3.8 miles of constructed fire line and 1.4 miles of existing roads, trails, and natural barriers used as fire line.

⁶ Known caves within the project area are not suitable and are not known to support NLEBs.

Prescribed burning could result in direct mortality or injury to NLEBs by burning, heat exposure, or smoke inhalation. Bats also may be exposed to elevated concentrations of potentially harmful compounds within the smoke (e.g., carbon monoxide and irritants) (Dickinson et al. 2009). However, the risk of direct mortality and injury to bats from prescribed fire is low as long as fire intensity and crown scorch height are low (Dickinson 2010). Thus, NLEBs may be forced to flee from roosting and foraging areas, but we expect minimal lethal take. In addition, it's stated in the BAE that prescribed while burns could be conducted in the summer or fall, most prescribed burning on the Salem Ranger District is conducted in late winter/early spring.

Some habitat loss could occur during tree removal activities. However, implementation of various timber management practices will ensure an abundance of roosting habitat on the MTNF. According to Forest Inventory and Analysis (FIA) data, there are currently over 500,000 standing dead trees with 5 inches dbh and greater within a 6 mile radius of the center of the project area, and 40% of the acres of forest type sampled are over 80 years old.

Effects to Bats during Spring and Summer – Potential effects from activities involving tree removal are expected to be similar to those described above for Spring Staging, Migration and Fall Swarming. However, the risk of injury or mortality is greatest in April through July when NLEB colonies are most concentrated and more bats may be found using fewer trees associated with their roosting networks. In addition, June through July is the period during which NLEBs are most likely to have non-volant pups. Thus, there is a higher likelihood of impact during the spring and summer from project activities involving tree removal.

As described under ***Effects to Bats during Spring Staging, Migration and Fall Swarming***, NLEBs also may be impacted during spring and summer by prescribed if roosting trees are occupied by bats during burning. However, because no burning will be conducted in June or July when pups are non-volant, we expect that most impacts will be in the form of harassment (i.e., bats may flee from roosting trees in treatment area) and anticipate that minimal injury or mortality will occur.

Effects to Habitat – Project activities may result in habitat modification, which would primarily involve changes to roosting and foraging suitability. Timber harvests and tree clearing associated with road-related activities could have both adverse and beneficial effects on habitat suitability for the NLEB. Prescribed fire may result in both adverse and beneficial effects on roosting habitat through loss and creation of existing roosts, and long-term changes in forest composition towards a greater abundance of suitable roosts in the future. Prescribed fire may also have a short-term adverse and long-term beneficial effect on prey abundance, and thus foraging habitat suitability in the action area. Given the scope of management treatments within the overall action area, these projects will not substantially alter the overall availability or suitability of NLEB roosting or foraging habitat.

Summary of Effects – Project activities have the potential to result in direct effects to NLEBs due to 1) the targeting of trees for removal that may have characteristics of suitable roost trees (salvage of dead and dying trees) and 2) the possibility that prescribed burning may be conducted during the active season. Effects may be in the form of fleeing from

roosts, loss of maternity roost trees, abandonment of roosts, injury, or death. However, the amount of take is expected to be low given the small proportion of the project area being impacted by activities, the timing of some of these activities, and the large number of potential roosting trees available on the Salem District. In addition, according to information in the BAE, 806 acres of project activities having the potential to result in take (Table 2) are within the Indiana Bat Area of Use and treatments will be conducted during hibernation. Thus, no NLEBs will be affected by project activities in this area. The overall habitat suitability or availability within the action area should be minimally affected by activities associated with the East Fork Huzzah Project.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Any actions conducted on the MTNF lands will either be conducted by the USFS, or will require approval by the USFS and thus will require separate section 7 consultation. Therefore, cumulative effects, as defined in the ESA, are not expected to occur on MTNF lands.

CONCLUSION

Based on the evaluation of effects, we do not expect activities associated with the East Fork Huzzah Project will result in a substantial impact to the NLEB colony/colonies occurring within the action area. While we recognize that the status of the species is uncertain due to WNS, we found that the proposed project is unlikely to have population-level impacts given the environmental baseline, and the intensity, frequency, and duration of project impacts. Thus, project activities are not expected to decrease the reproduction, numbers, or distribution of the NLEB rangewide, and we do not anticipate a reduction in the likelihood of survival or recovery of the species as a whole.

After reviewing the current status of this species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the NLEB. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly

disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

On April 2, 2015, the Service published an interim species-specific rule pursuant to section 4(d) of the ESA for NLEB (U.S. Fish and Wildlife Service 2015a). The Service's interim 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, when such take occurs as follows (see the interim rule for more information):

4. Take that is incidental to forestry management activities, maintenance/limited expansion of existing rights-of way, prairie management, projects resulting in minimal (<1 acre) tree removal, provided these activities:
 - a. Occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula;
 - b. Avoid cutting or destroying known, occupied roost trees during the pup season (June 1–July 31); and
 - c. Avoid clearcuts (and similar harvest methods, *e.g.*, seed tree, shelterwood, and coppice) within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1–July 31).
5. Removal of hazard trees (no limitations).
6. Purposeful take that results from
 - a. Removal of bats from and disturbance within human structures and
 - b. Capture, handling, and related activities for northern long-eared bats for 1 Year following publication of the interim rule.

We have determined that all incidental take associated with the East Fork Huzzah Project will be carried out in compliance with the interim 4(d) rule and thus, does not require exemption in this Incidental Take Statement. Accordingly, there are no reasonable and prudent measures or terms and conditions that are necessary and appropriate for these actions because all incidental take has already been exempted.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

The Service has identified the following actions that, if undertaken by the USFS, would further the conservation of the NLEB.

1. Continue to conduct surveys for bats on the MTNF to better define areas of occupancy relative to each Forest Service District.
2. Assist with WNS investigations. For example:
 - a. Monitor the status/health of the known colonies;
 - b. Collect samples for ongoing or future studies;
 - c. Provide funding for WNS research activities; and
 - d. Allow USFS staff to participate in research projects.
3. Monitor post-WNS distribution of NLEB on the Mark Twain National Forest.
 - a. Conduct targeted P/A surveys
 - b. Conduct radio telemetry to monitor status of NLEB colonies
4. Encourage collaborative research on the summer habitat requirements of NLEB on the MTNF that contribute to knowledge of:
 - a. Habitat characteristics of the forest in areas where post-WNS population occurrences have been documented, and
 - b. Bat use (acoustics, radio telemetry) of recently managed areas where various prescriptions have been implemented.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the conservation recommendations carried out.

REINITIATION NOTICE

This concludes formal consultation for the USFS's actions outlined in your request dated April 13, 2015. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

LITERATURE CITED

- Amelon, S., and D. Burhans. 2006. Conservation assessment: *Myotis septentrionalis* (northern long-eared bat) in the eastern United States. Pages 69-82 in Thompson, F. R., III, editor. Conservation assessments for five forest bat species in the eastern United States. U.S. Department of Agriculture, Forest Service, North Central Research Station, General Technical Report NC-260. St. Paul, Minnesota. 82pp.
- Barbour, R.W., and W.H. Davis. 1969. Bats of America. The University of Kentucky Press, Lexington, Kentucky. 311pp.
- Barclay, R. M. R., and A. Kurta. 2007. Ecology and behavior of bats roosting in tree cavities and under bark. Pages 17-59 in Bats in forests: conservation and management. (M. J. Lacki, J. P. Hayes, and A. Kurta, eds.). Johns Hopkins University Press, Baltimore, Maryland.
- Boyles, J.G., and D.P. Aubrey. 2006. Managing forests with prescribed fire: Implications for a cavity-dwelling bat species. *Forest Ecology and Management*, 222:108-115.
- Caceres, M.C. and M.J. Pybus. 1997. Status of the northern long-eared bat (*Myotis septentrionalis*) in Alberta. Alberta Environmental Protection, Wildlife Management Division, Wildlife Status Report No. 3, Edmonton, AB, 19pp.
- Caceres, M.C. and R.M.R. Barclay. 2000. *Myotis Septentrionalis*. *Mammalian Species*, 634:1-4.
- Carter, T.C., and G. Feldhamer. 2005. Roost tree use by maternity colonies of Indiana bats and northern long-eared bats in southern Illinois. *Forest Ecology and Management*, 219: 259-268.
- Dickinson, M.B., M.J. Lacki, and D.R. Cox. 2009. Fire and the endangered Indiana bat. Proceedings of the 3rd Fire in Eastern Oak Forests Conference GTR-NRS-P-46, p. 51-75.
- Dickinson, M.B. 2010. Burning and bats: fire's effect on the endangered Indiana bat. *Fire Science Brief* 109:1-6.
- Environment Yukon. 2011. Yukon Bats. Government of Yukon, Environment Yukon, Whitehorse, Yukon. 22pp.
- Foster, R.W., and A. Kurta. 1999. Roosting ecology of the northern bat (*Myotis septentrionalis*) and comparisons with the endangered Indiana bat (*Myotis sodalis*). *Journal of Mammalogy* 80(2):659-672.
- Garroway, C.J., and H.G. Broders. 2007. Nonrandom association patterns at northern long-eared bat maternity roosts. *Canadian Journal of Zoology*, 85:956-964.

- Johnson, J.B., W.M. Ford, and J.W. Edwards. 2012. Roost networks of northern myotis (*Myotis septentrionalis*) in a management landscape. *Forest Ecology and Management* 266:223-231.
- Meteyer, C.U., E.L. Buckles, D.S. Blehert, A.C. Hicks, D.E. Green, V. Shearn-Bochsler, N.J. Thomas, A. Gargas, and M.J. Behr. 2009. Histopathologic criteria to confirm white-nose syndrome in bats. *Journal of Veterinary Diagnostic Investigation* 21:411-414.
- Nagorsen, D.W. and R.M. Brigham. 1993. Bats of British Columbia. Royal British Columbia Museum, Victoria, and the University of British Columbia Press, Vancouver. 164 pp.
- Owen, S.F., M.A. Menzel, W.M. Ford, J.W. Edwards, B.R. Chapman, K.V. Miller, and P.B. Wood. 2002. Roost tree selection by maternal colonies of Northern long-eared Myotis in an intensively managed forest. USDA Forest Service. Newtown Square, Pennsylvania. 10 pp.
- Patriquin, K.J. and R.M. Barclay. 2003. Foraging by bats in cleared, thinned and unharvested boreal forest. *Journal of Applied Ecology*, 40:646-657.
- Reeder, D.M., C.L. Frank, G.G. Turner, C.U. Meteyer, A. Kurta, E.R. Britzke, M.E. Vodzak, S.R. Darling, C.W. Stihler, A.C. Hicks, R. Jacob, L.E. Grieneisen, S.A. Brownlee, L.K. Muller, and D.S. Blehert. 2012. Frequent arousal from hibernation linked to severity of infection and mortality in bats with white-nose syndrome. *PLoS ONE* 7(6):1-10.
- Reichard, J.D. and T.H. Kunz. 2009. White-nose syndrome inflicts lasting injuries to the wings of little brown myotis (*Myotis lucifugus*). *Acta Chiropterologica* 11(2):457-464.
- Sasse, D.B., and P.J. Pekins. 1996. Summer roosting ecology of northern long-eared bats (*Myotis septentrionalis*) in the white mountain national forest. Bats and Forests Symposium October 1995, Victoria, British Columbia, Canada, pp.91-101.
- Timpone, J.C., J.G. Boyles, K.L. Murray, D.P. Aubrey, and L.W. Robbins. 2010. Overlap in roosting habits of Indiana bats (*Myotis sodalis*) and northern bats (*Myotis septentrionalis*). *The American Midland Naturalist* 163(1): 115-123.
- U.S. Fish and Wildlife Service. 2014. Northern Long-eared Bat Interim Conference and Planning Guidance. USFWS Regions 2, 3, 4, 5, & 6. Available at <http://www.fws.gov/midwest/endangered/mammals/nlba/pdf/NLEBinterimGuidance6Jan2014.pdf>.
- U.S. Fish and Wildlife Service. 2015a. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat with 4(d) Rule. Federal Register 80(63): 17973-18033.

- U.S. Fish and Wildlife Service. 2015b. Biological Opinion on effects to the northern long-eared bat from ongoing activities on the Mark Twain National Forest, Missouri. Columbia Missouri Ecological Services Field Office, Columbia, Missouri. 52 pp.
- U.S. Forest Service. 2005. Mark Twain National Forest 2005 Forest Plan. Mark Twain National Forest. Rolla, Missouri. 234 pp.
- U.S. Forest Service. 2014. Amendment to June 14, 2005 Programmatic Biological Assessment Forest Plan Revision. Mark Twain National Forest. Rolla, Missouri. 54 pp.
- Warnecke, L., J.M. Turnera, T.K. Bollinger, J.M. Lorch, V. Misrae, P.M. Cryan, G. Wibbelt, D.S. Blehert, and C.K.R. Willis. 2012. Inoculation of bats with European *Geomyces destructans* supports the novel pathogen hypothesis for the origin of white-nose syndrome. PNAS 109(18):6999-7003.
- Whitaker, J.O., and W.J. Hamilton. 1998. Mouse-eared bats, Vespertilionidae. In *Mammals of the eastern United States, Third Edition*. Comstock Publishing Associates, a Division of Cornell University Press, Ithaca, New York, pp.89-102.
- Whitaker, J.O., and L.J. Rissler. 1992. Seasonal activity of bats at copperhead cave. Proceedings of the Indiana Academy of Science, 101:127-134.
- Yates, M.D., and R.M. Muzika. 2006. Effect of forest structure and fragmentation on site occupancy of bat species in Missouri Ozark Forests. The Journal of Wildlife Management, 70(5):1238-1248.