

## APPENDIX E

### Comparison of the 1999 MTNF Programmatic Biological Opinion terms and conditions with the 2005 Forest Plan Standards and Guidelines and 2005 Programmatic Biological Opinion terms and conditions

The MTNF has incorporated into the 2005 Forest Plan, through the Standards and Guidelines for Indiana bats, many of the terms and conditions outlined in the 1999 Programmatic Biological Opinion. The terms and conditions in the 2005 Programmatic Biological Opinion address the same or additional measures for the Indiana bat. The following is a point by point comparison of those measures in both documents.

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#### 1999 TERM AND CONDITION (1999 T&C):

*Continue protection of the two known, occupied Indiana bat caves on the MTNF by maintaining angle-iron gates; continue working with the Service and MDC to determine protection needs (e.g., gates, signs, etc) of any additional occupied Indiana bat caves (hibernacula) discovered on the MTNF.*

#### 2005 Forest Plan STANDARDS AND GUIDELINES (2005 S&G):

*All structures placed at cave entrances must permit bats to pass with minimal danger and must not alter airflow into or out of the cave, regardless if federally listed bats currently occupy the cave.*

*Maintain, and replace as needed, existing gates at occupied Indiana or gray bat caves.*

*All occupied Indiana and gray bat caves should be periodically assessed to determine needs for physical protection of the cave entrance.*

*All cave gates and protective structures should be periodically monitored to detect trespass, vandalism, or other situations which render those structures ineffective.*

*Evaluate abandoned mines for use by bats prior to permanent closure.*

*Except for regularly scheduled population monitoring, or other legitimate scientific purposes, do not allow human entrance to Indiana bat hibernacula during the fall swarming, hibernation, and spring emergence period.*

#### Conclusion

The 2005 S&G's provide additional protection to occupied hibernacula that was not included in the 1999 T&C's.

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1999 T&C

*Increase the area of old growth forest (old growth) around caves with current populations of Indiana bats to 20 contiguous acres and maintain a mature/overmature forest for an additional 130 acres around occupied caves with Indiana bat populations; this will include the cave entrance, the area above any known cave passage, the foraging corridor from cave to nearest water source, and ridgetops/side slopes above the cave – a minimum of 150 acres of mature/overmature forest will be maintained around all occupied caves.*

2005 S&G

*Designate an area of at least 20 acres completely surrounding an Indiana or gray bat cave entrance(s) – including the area above known or suspected cave or mine passages, foraging corridor(s), ridgetops, and side slopes around the cave for permanent old growth management. Within this area, only vegetation management activities needed to reach the desired conditions are allowed.*

*Maintain and additional 130 acres of mature forest or mature woodland around each occupied Indiana or gray bat cave.*

Conclusion:

2005 S&G provide same protection of cave entrances and foraging areas as the 1999 T&C

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1999 T&C

*For even-aged regeneration harvests, group “leave” trees around large snags, large live trees, and den trees to protect potential roost trees from wind throw.*

*Within shelterwood harvests, retain a minimum of 25 basal area (BA) of residual trees; within clearcuts and seed tree harvests; retain a minimum of 15 BA of reserve trees; to the maximum extent possible, such reserve trees shall be located in groups and along intermittent drainages to provide foraging corridors into harvested areas.*

2005 S&G

*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.*

*Whenever vegetation management is undertaken, leave standing dead trees, cavity or den trees, and downed woody material whenever possible, while providing for public safety and the achievement of resource management goals and objectives.*

*All even-aged regeneration harvests shall retain at least 7-10% of the harvest unit in reserve trees and/or reserve tree groups.*

*Reserve tree and reserve tree groups should include a combination of the following:*

- *The largest, long lived species occurring on the site (pine, white oak, post oak, hickory, black gum);*
- *Standing dead trees; and*
- *Cavity or den trees.*

*Space reserve trees and reserve tree groups to mimic natural community structure and composition.*

*Include a combination of at least five trees in reserve tree groups. Where opportunities permit, locate some reserve tree groups within drainages.*

*Plan salvage sales to leave at least 10-15% of the affected area, unless the area presents an unacceptable risk to public health or safety, or threatens forest health. These areas should be in a variety of patch sizes and distributions on the landscape.*

### Conclusion

2005 S&G provide more direction for leave trees in harvest units than 1999 T&C's.

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### 1999 T&C

*Determine an area of influence for each occupied Indiana bat cave that is on or adjacent to lands managed by the MTNF. The size and shape of this area of influence will be determined by: 1) significance provided to the cave as outlined by the Service (1983b, 1999) and as published in the Federal Register 32(48):4001 (i.e., Priority 1 or Priority 2, designated as critical habitat, etc.), 2) the maximum population number recorded, 3) the relative amounts of National Forest lands and other ownerships nearby, 4) current land use practices nearby, 5) the amount of preferred foraging habitat currently available (as defined by Romme et al 1995) and 6) and additional condition specific to that cave which may affect bat use. The area of influence shall not exceed a 5.0 mile radius circle centered on the hibernaculum following the findings of 3D/Environmental (1996), except as agreed to by the Service and Forest Service and determined to be based on best science available, result in the discovery of a larger foraging radius.*

*In cooperation with the Service and MDC, develop a management recovery strategy within one year after issuance of this biological opinion for lands managed by the MTNF within the area of influence of any occupied Indiana bat cave located on the National Forest.*

*In cooperation with the Service and MDC, develop a management recovery strategy within two years after issuance of this biological opinion for lands managed by the*

*MTNF within the area of influence of any occupied Indiana bat cave adjacent to the National Forest.*

*Management recovery strategies listed above for caves on and adjacent to, the MTNF, will include vegetation objectives for providing: a) a continuous supply of potential and suitable roost trees as outlined above, and b) ample preferred foraging habitat as outlined by Romme et al (1995).*

*In cooperation with the Service and MDC, develop a management recovery strategy within one year after issuance of this biological opinion, for lands managed by the MTNF within an area of influence approximately 3/4 of one mile [based on the foraging radius of a post-lactating female as determined by Gardner et al. (1991b)] centered on all locations where reproductively active females have been caught between May 15 and August 15. Such areas of influence shall be applicable to locations of reproductively active females recently (i.e., within the last five years) captured on lands adjacent to the MTNF as well as the locations of any reproductively active females discovered on the National Forest in the future. This management recovery strategy will include vegetation objectives for providing: a) a continuous supply of potential and suitable, maternity roost trees as outlined above, and b) ample preferred foraging habitat as outlined by Romme et al. (1995).*

*In the event that reproductively active female(s) is discovered on lands managed by the MTNF between May 15 and August 15, the following is requested: 1) in consultation with the Service, MDC, and other recognized bat experts, as needed, and when such actions will not knowingly result in the death or injury to the captured individual(s), conduct a radio telemetry study to determine the location of the maternity colony, 2) upon discovery of a maternity colony, immediately initiate informal consultation with the Service.*

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

*with a canopy closure of 60-80%, following the guidelines outlined in Romme et al. (1995), must be maintained.*

*For the Cedar Creek District, the following is requested: 1) to the maximum extent possible and logistically practical, maintain, on average, a minimum of 23 suitable roost trees per acre on forested acreage, 2) suitable roost trees contributing to the minimum listed above may include the following: 1) live shagbark and shellbark hickories  $\geq 9$ " dbh, 2) lightning struck trees  $\geq 9$ " dbh and trees  $\geq 9$ " dbh, 3) dead or dying trees  $\geq 9$ " dbh with at least 10% exfoliating or defoliating bark, 4) den or cull trees, and 5) live trees  $\geq 26$ " dbh, 3) as outlined in the LRMP for the MTNF, incorporate only uneven-aged management techniques on this unit, 4) of the 23 roost trees maintained, to the maximum extent possible and logistically practical, retain all dead trees  $\geq 20$ " dbh and all live trees  $\geq 26$ " dbh unless they are an immediate human safety hazard, and 5) a canopy closure of 60-80% following the guidelines outlined in Romme et al. (1995) must be maintained.*

*In the event that reproductively active female(s) is discovered on lands managed by the MTNF between May 15 and August 15, the following is requested: 1) in consultation with the Service, MDC, and other recognized bat experts, as needed, and when such actions will not knowingly result in the death or injury to the captured individual(s), conduct a radio telemetry study to determine the location of the maternity colony, 2) upon discovery of a maternity colony, immediately initiate informal consultation with the Service.*

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

*For the Cedar Creek District, the following is requested: 1) to the maximum extent possible and logistically practical, maintain, on average, a minimum of 23 suitable roost trees per acre on forested acreage, 2) suitable roost trees contributing to the minimum*

*listed above may include the following: 1) live shagbark and shellbark hickories  $\geq 9$ " dbh, 2) lightning struck trees  $\geq 9$ " dbh and trees  $\geq 9$ " dbh, 3) dead or dying trees  $\geq 9$ " dbh with at least 10% exfoliating or defoliating bark, 4) den or cull trees, and 5) live trees  $\geq 26$ " dbh, 3) as outlined in the LRMP for the MTNF, incorporate only uneven-aged management techniques on this unit, 4) of the 23 roost trees maintained, to the maximum extent possible and logistically practical, retain all dead trees  $\geq 20$ " dbh and all live trees  $\geq 26$ " dbh unless they are an immediate human safety hazard, and 5) a canopy closure of 60-80% following the guidelines outlined in Romme et al. (1995) must be maintained.*

### Commentary

In response to the above 1999 T&C's (and the following 1999 T&C's dealing with maternity colonies, the MTNF, in consultation with the Service, created "Management Prescription 3.5" as an amendment to the Forest Plan previous to the Revised Forest Plan under consultation now. Management Prescription 3.5 is as follows:

#### Desired Future Condition:

Management areas will be defined around occupied Indiana bat hibernacula and known sites of reproductively active females. Areas will vary in size, but will extend no more than 5 miles in radius from hibernacula, and no more than  $\frac{3}{4}$  mile in radius from known sites of reproductively active females.

Management areas will provide a continuous supply of suitable roost trees and preferred foraging habitat for Indiana bat.

#### Standards and Guidelines:

##### 1900 Land and Resource Management Planning

###### Vegetation

Vegetation management will be done only to improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities on appropriate sites, or for public safety.

##### 2200 Range Management

The development of the forage resource will be limited to existing allotments within the Indiana bat areas of influence. Allotment plans will be designed to protect or enhance Indiana bat habitat and water quality values.

##### 2300 Recreation Management

The semi-primitive non-motorized ROS class will be applied to the area identified as the key area. Semi-primitive motorized ROS class shall be applied to all other lands within the areas of influence, except within the boundaries of developed recreation sites.

The Indiana bat areas of influence will be managed to meet the visual quality objective of Modification.

Indiana bat caves will be closed to human visitation from September 15 through April 30.

#### 2400 Timber Management

Timber management practices may be implemented on National Forest lands within the Indiana bat areas of influence only to improve or enhance Indiana bat habitat, to maintain or enhance natural vegetative communities on appropriate sites, or for public safety.

#### 2600 Wildlife Management

Each area of influence will consist of the following elements: 1) the hibernaculum; 2) key area (cave opening and adjacent stands); 3) primary range (compartments adjacent to key area, up to 5 mile radius from cave).

1) Hibernaculum- Protect each Indiana bat hibernaculum during the period of September 15 to August 15 by restricting human disturbance. Any structure placed at the roost cave must not alter airflow. Any gate construction should refer to plans of proper gate designs available from the American Cave Association.

2) Key Area – Protect the surface surrounding the hibernaculum by maintaining a minimum of 20 acres of old growth forest around each occupied Indiana bat cave to include cave entrance, area above any known cave passage, foraging corridor, and ridgetops/side slopes around the cave. Maintain an additional 130 acres of mature forest around each occupied Indiana bat cave.

#### 3) Primary Range –

Provide a continuous supply of suitable roost trees by maintaining a minimum of 20 percent of the primary range in old growth, and a minimum of 50 percent in oak and oak-pine types over 50 years of age.

Provide ample preferred foraging habitat by maintaining a minimum of 50 percent of the primary range in pole and sawtimber size classes with 50 to 70 percent crown closure.

Natural regeneration may be used to ensure the perpetuation of oak-hickory and oak-pine forests. No more than 7 percent of the primary range may be in woodland habitat in the 0-9 age class at any time.

Provide adequate water sources by maintaining between 1 and 4 water sources per square mile within the primary range.

In order to maintain viable populations of management indicator species, sensitive species, and other threatened and endangered species while providing ample Indiana bat foraging habitat, up to 15 percent of the primary range may be maintained in open or semi-open habitats.

#### 2700 Special Uses Management

Special use permits may be issued within the areas of influence only when they meet the terms and conditions and reasonable and prudent measures of the June 23, 1999 Biological Opinion.

#### 2800 Minerals and Geology

No drilling will be allowed in the key area. Drilling may be permitted in the primary range if it is supported by an environmental analysis and other Forest Plan direction.

Use existing openings when available. If existing openings are not available, remove only the minimum vegetation necessary for the drill site itself.

If existing access routes are not available to the drill site, remove only the minimum vegetation necessary to develop a temporary road.

#### 5100 Fire Management

Determine the level of fire prevention and suppression by the value-at-risk within each management area. On a scale of 1 (high) to 5 (low) the value at risk within this management area is estimated at "1."

All Indiana bat areas of influence will be considered smoke sensitive areas, and burn plans will be written to minimize smoke to the areas of influence and the caves.

#### 7700 Transportation System

The Forest Service road system permitted within this special area is shown on the Forest Plan transportation map, as amended.

### 2005 S&G

*Designate an area of at least 20 acres completely surrounding an Indiana or gray bat cave entrance(s) – including the area above known or suspected cave or mine passages, foraging corridor(s), ridgetops, and side slopes around the cave for permanent old growth management. Within this area, only vegetation management activities needed to reach the desired conditions are allowed.*

*Maintain and additional 130 acres of mature forest or mature woodland around each occupied Indiana or gray bat cave.*

*The area around occupied Indiana or gray bat caves is a smoke-sensitive area. Develop prescribed burn plans to avoid or minimize smoke influences at or near these caves. Give the U.S. Fish and Wildlife Service an opportunity to review and comment on prescribed burn plans within these areas.*

*Minimize the impact of smoke for each prescribed fire by identifying smoke-sensitive areas, using best available control measures, monitoring smoke impacts, and following applicable guidance.*

*Within the 20 acres of old growth and 130 acres of forest or mature woodland surrounding an Indiana bat hibernacula, avoid prescribed burning and removal of suitable roost trees in the swarming and staging periods – dates to be determined individually for each cave (normally between September 1 and November 1 and between March 15 and April 31 respectively).*

*Prohibit timber harvest activities within 100 feet of the edge of a sinkhole, cave entrance, or within the buffer zone for wetland features. (Reference: Forestwide Standards and Guidelines for Geological Features under Terrestrial and Aquatic Wildlife management.)*

*Prohibit skid trails within 100 feet of the edge of a sinkhole, cave entrance, or other karst feature, or within the buffer zone for wetland features. (Reference Forest-wide Standards and Guidelines for Geological Features under Terrestrial and Aquatic Wildlife management.)*

*Prohibit surface-disturbing mineral activities within 100 feet of the edge of a cave entrance, spring, seep, fen, sinkhole, or shrub swamp.*

*Prohibit core drilling or other surface disturbing mineral operations over known caves and in the 20 acres designated around Indiana bat or gray bat caves and the additional 130 acres designated around Indiana bat caves.*

*Do not use caves, sinkholes, and other karst features when locating new common variety disposal locations or pits.*

*Do not allow camping within caves and 100 feet of a cave entrance.*

*Locate new trails at least 100 feet from a cave entrance or wetland, unless the trail leads to an overlook or other interpretive opportunity regarding the natural feature. When reconstructing or maintaining existing trails near karst or wetland features, consider relocating the trail away from the feature.*

*Whenever possible, avoid road construction:*

- » *Above known cave passages;*
- » *Within 100 feet of known cave and abandoned mine entrances;*

*Where feasible, relocate roads away from known cave entrances during road reconstruction or maintenance activities.*

*Whenever possible, avoid temporary road construction:*

- » *Above known cave passages;*

» *Within 100 feet of known cave and abandoned mine entrances;*

*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.*

*If occupied Indiana bat maternity roost trees are discovered, protect them from physical disturbance until they naturally fall to the ground. Designate an area of use based on site conditions, radio-tracking or other survey information, and best available information regarding maternity habitat needs. Minimize human disturbance in the foraging and roosting areas of the maternity colony until the colony has left the maternity area for hibernation. The character of the site should be maintained or enhanced year-round by (1) maintaining an adequate number of snags, including known roost trees; (2) maintaining large live trees to provide future roosting opportunities; and (3) maintaining small canopy gaps (and/or opening the mid-story) to provide a continual source of foraging habitat.*

*Within the area of use (foraging and roosting) determined for each maternity colony, conduct prescribed burning only during the hibernation season.*

*Using the current, accepted technology, determine the location of summer roost trees and foraging areas for female Indiana bats.*

*If occupied Indiana bat male roost trees are discovered during the summer season (not migration), protect them from physical disturbance by designating a 75-foot radius buffer zone around the tree(s). Within the buffer zone, no ground-disturbing activity or timber harvest shall occur. Prescribed burning may be done within the buffer zone if a fireline is manually constructed no less than 25 feet from, and completely around, the tree to prevent it from catching fire. The buffer zone shall remain in place until hibernation season begins (around November 1.)*

*Protect known male roost trees from physical disturbance until they naturally fall to the ground.*

### 2005 T&C

*During site specific project planning, the effects of management on suitable roosting and foraging habitat within a 5 mile radius around known hibernacula must be considered and such habitat must be maintained or enhanced in that area.*

### Conclusion

The 2005 S&G and T&C will provide more benefits to Indiana bats than the 1999 T&C.

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### 1999 T&C

*(In order to increase the number of potential, suitable roost trees on the MTNF above what currently exists, the following is recommended):*

*To the maximum extent possible and logistically practical, maintain, on average, a minimum of 23 suitable roost trees per acre on forested acreage on the MTNF. Suitable roost trees contributing to the minimum listed above may include the following: 1) live shagbark and shellbark hickories  $\geq 9$ " dbh, 2) lightning struck trees  $\geq 9$ " dbh and trees  $\geq 9$ " dbh, 3) dead or dying trees  $\geq 9$ " dbh with at least 10% exfoliating or defoliating bark, 4) den or cull trees, and 5) live trees  $\geq 26$ " dbh.*

*Of the 23 roost trees maintained, to the maximum extent possible and logistically practical, retain dead trees  $\geq 20$ " dbh and live trees  $\geq 26$ " dbh unless they are an immediate human safety hazard.*

### Commentary

Maintaining already existing suitable trees does not in reality "increase the number of potential, suitable roost trees." FIA data show that there are 14.7 million dead/dying trees over 5" dbh on the MTNF. The MTNF estimates that approximately 300,000 trees die per year on the Forest. The natural mortality of trees and trees damaged by catastrophic events (i.e., tornados, hail or wind storms), more than replace the number of potentially suitable roost trees removed by the MTNF in any given year. This does not account for the number of live suitable roost trees that are not removed across the Forest in general management areas, in wilderness areas, designated old growth areas or other special management areas with little harvest.

The 1999 T&C's could not be practicably measured in the field.

### 2005 S&G

*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.*

*Whenever vegetation management is undertaken, leave standing dead trees, cavity or den trees, and downed woody material whenever possible, while providing for public safety and the achievement of resource management goals and objectives.*

*All even-aged regeneration harvests shall retain at least 7%-10% of the harvest unit in reserve trees and/or reserve tree groups.*

*Reserve trees and reserve tree groups should include a combination of the following:*

- » *The largest, long-lived species occurring on the site (pine, white oak, post oak, hickory, black gum);*
- » *Standing dead trees; and*
- » *Cavity or den trees.*

## Conclusion

2005 S&G provide roosting and foraging habitat components based on site-specific conditions and data rather than applying a blanket formula for all areas. While the 2005 S&G's do not specify a specific number of trees to maintain, we believe these standards and guidelines will provide ample suitable roosting and foraging habitat across the MTNF.

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## 1999 T&C

*Consider occupied Indiana bat hibernacula as smoke sensitive areas during planning for prescribed burns conducted from November to April in the vicinity of occupied caves. Wind direction, speed, mixing height, and transport winds will be used during burn planning and implementation to minimize smoke drifting in or near occupied hibernacula.*

*Consider areas near Indiana bat hibernacula ("areas of influence" as previously defined), the Cedar Creek District, and areas adjacent to locations where reproductively active females have been captured between May –July, as smoke sensitive areas during planning for prescribed fires conducted for prescribed fires from May to October. Special precautions are to be taken to protect large snags ( $\geq 16$ " dbh) which are not safety hazards; such snags should be protected from fire and smoke. Wind direction, speed, mixing height, and transport winds are to be used during burn planning and implementation to minimize smoke intensity and duration of burns.*

*Prior to the employment of any prescribed fire, provide the Service's Columbia, Missouri Ecological Services Field Office with the opportunity to review burn plans that could potentially impact Indiana bats.*

## 2005 T&C

*The area around occupied Indiana or gray bat caves is a smoke-sensitive area. Develop prescribed burn plans to avoid or minimize smoke influences at or near these caves. Give the U.S. Fish and Wildlife Service an opportunity to review and comment on prescribed burn plans within these areas.*

*Minimize the impact of smoke for each prescribed fire by identifying smoke-sensitive areas, using best available control measures, monitoring smoke impacts, and following applicable guidance.*

*Within the 20 acres of old growth and 130 acres of forest or mature woodland surrounding an Indiana bat hibernacula, avoid prescribed burning and removal of suitable roost trees in the swarming and staging periods – dates to be determined*

*individually for each cave (normally between September 1 and November 1 and between March 15 and April 31 respectively).*

*Within the area of use (foraging and roosting) determined for each maternity colony, conduct prescribed burning only during the hibernation season.*

*If occupied Indiana bat male roost trees are discovered during the summer season (not migration), protect them from physical disturbance by designating a 75-foot radius buffer zone around the tree(s). Within the buffer zone, no ground-disturbing activity or timber harvest shall occur. Prescribed burning may be done within the buffer zone if a fireline is manually constructed no less than 25 feet from, and completely around, the tree to prevent it from catching fire. The buffer zone shall remain in place until hibernation season begins (around November 1.)*

### Conclusion

The 2005 S&G will provide more protection to Indiana bats than the 1999 T&C.

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### 1999 T&C

*Continued, regular monitoring of occupied Indiana bat caves on the MTNF to assess changes in population numbers, changes in microclimate, the effectiveness of protective structures currently in place, etc.*

### 2005 S&G

*All occupied Indiana and gray bat caves should be periodically assessed to determine needs for physical protection of the cave entrance.*

*All cave gates and protective structures should be periodically monitored to detect trespass, vandalism, or other situations which render those structures ineffective.*

### 2005 T&C

*Continue monitoring occupied Indiana bat hibernacula on the MTNF to assess changes in population numbers, changes in microclimate, the effectiveness of protective structures currently in place, etc.*

### Conclusion

Monitoring of winter populations and habitat will be the same under the 2005 Forest Plan as provided for in the 1999 S&G.

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1999 T&C

*Monitor the extent of use of Indiana bats on all districts of the MTNF. Such monitoring should include the employment of techniques to determine: 1) the presence or absence of the species on the National Forest, 2) habitat use and movements of Indiana bats during the spring-fall periods, 3) the location of any potential maternity sites, 4) the major foraging areas used by male Indiana near occupied caves during the summer and during spring-fall migration. Comparative analyses involving mist net surveys and Anabat Detectors are strongly encouraged to assess the presence or absence of the species on the MTNF. The use of radio telemetry is strongly encouraged to determine the location of maternity colonies and is assessing habitat use and movements of the species throughout the National Forest.*

2005 S&G

*Using the current, accepted technology, determine the location of summer roost trees and foraging areas for female Indiana bats.*

*Conduct an evaluation for the presence of Indiana bats prior to any decision to remove a building or bridge.*

2005 T&C

*Continue monitoring the extent of use by Indiana bats on the MTNF. Such monitoring should include the employment of currently accepted techniques used to gather information on the Indiana bat on the MTNF. Continue to use the current survey strategy as outlined in the BA, prioritizing the surveying of areas that have a higher probability of having Indiana bat use (better habitat conditions existing and current records)- especially on the Salem, Potosi/Fredericktown, Poplar Bluff, and Houston/Rolla/Cedar Creek Ranger Districts).*

Conclusion

Monitoring of summer habitat use on MTNF will focus on areas of likely Indiana bat occurrence. The focus of future monitoring will result in improved information on summer habitat use.

1999 T&C

*If monitoring activities result in the discovery of maternity sites on the MTNF, they will be protected along with associated roosts and foraging areas following the guidelines outlined above.*

2005 S&G

See above.

Conclusion

Repeating this as a T&C in 2005 would be redundant, since the MTNF has proposed to do this in the 2005 S&G's.

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1999 T&C

*Habitat use at all sites where Indiana bats are documented on the MTNF should be characterized and quantified at both local and landscape levels using GIS and other advanced computer software.*

2005 T&C

*Habitat use at all sites where Indiana bats are documented on the MTNF should be characterized and quantified at both local and landscape levels using GIS and other advanced computer software.*

Conclusion:

Same T&C.

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1999 T&C

*The amount of incidental take (both total and categorical levels of forested acres affected and the number of bats) as identified in this opinion must be monitored on an annual basis. This information is to be provided to the Service's Columbia, Missouri Ecological Services Field Office, no later than 6 months following the end of the previous year's activities.*

2005 T&C

*The amount of incidental take as identified in this opinion must be monitored on an annual basis. Work with the Columbia, Missouri Ecological Services Field Office to develop a monitoring form for all Districts to use.*

Conclusion

Incidental take will continue to be monitored on the MTNF.

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### 1999 T&C

*The number of suitable roost trees and preferred foraging habitat available to the species shall on the MTNF shall be monitored according to the following schedule: 1) as part of the Forest Service's Forest Inventory Assessment (FIA), assess, at a minimum, once every ten years, the number of available, suitable roost trees and the amount of foraging habitat throughout the MTNF, and 2) annually monitor the number of available, suitable roost trees and the amount of foraging habitat within each of the following sampling areas: a) within 5 miles of all currently known or potentially discovered new occupied Indiana bat caves on the MTNF, b) within 3/4 miles of any location on the MTNF where a maternity colony or reproductively active female is discovered, c) at selected sites sampled on the Cedar Creek District, and d) at selected sites sampled within all other districts of the MTNF. The degree of sampling and the selection of sampling sites will be determined in consultation with the Service and MDC and identified by October 1, 1999.*

*The results of all monitoring activities shall be provided to the Service's Columbia, Missouri Ecological Services Field Office, and MDC, no later than December 31 of each year.*

*Provide to personnel of the Service's Columbia, Missouri Ecological Services Field Office and to MDC, an opportunity to conduct site visits to all districts of the MTNF, to evaluate compliance of monitoring requirements. Site visits will be scheduled by mutual consent of the Service and personnel of the MTNF. Upon completion of such visits, the Service will provide a written report on the results of such field investigations.*

### 2005 T&C

*Monitor the number of suitable roost trees available to the species on the MTNF using Forest Inventory Analysis (FIA data) once every five years at a minimum.*

*The amount of incidental take as identified in this opinion must be monitored on an annual basis. Work with the Columbia, Missouri Ecological Services Field Office to develop a monitoring form for all Districts to use.*

*The results of all monitoring activities shall be provided to the Service's Columbia, Missouri Ecological Services Field Office and MDC, no later than December 31 of each year.*

*Provide to personnel of the Service's Columbia, Missouri Ecological Services Field Office, and to MDC, an opportunity to conduct site visits to all Districts of the MTNF, to evaluate compliance of monitoring requirements. Site visits will be scheduled by mutual consent of the Service and personnel of the MTNF.*

## Conclusion

These are generally the same measures. An FIA analysis was conducted to determine the number of suitable roost trees available on the MTNF (as directed in the 1999 PBO). This information was presented in the BA for the 2005 Forest Plan. See the text of this biological opinion and the biological assessment for more information from this analysis. Preferred foraging habitat is monitored through the BE program described in Term and Condition #2d of this Biological Opinion.

## **Overall conclusion**

The 2005 Forest Plan and the terms and conditions from this programmatic biological opinion provide the same or greater conservation benefits to Indiana bats that may use the MTNF.