

BEFORE THE SECRETARY OF INTERIOR

SOUTHERN APPALACHIAN

PETITION TO DESIGNATE CRITICAL HABITAT FOR THE SUMMER HABITAT OF THE INDIANA BAT (*MYOTIS SODALIS*) UNDER THE ENDANGERED SPECIES ACT

*Filed under 5 U.S.C. 553(e)  
and 16 U.S.C. 1533(b)(3)(D)*

October 18, 2002

EXECUTIVE SUMMARY

The Indiana bat is an endangered species (32 Fed. Reg .4001; March 11, 1967) with designated critical habitat (50 CFR 17.95(a)). However, when critical habitat was designated in 1976 there was little knowledge of the Indiana bat's summer habitat, and therefore the current critical habitat merely consists of the major caves and mines where the Indiana bat hibernates over the winter. Since 1976, scientists have made major strides in determining the Indiana bat's summer habitat. This petition outlines the areas where the Indiana bat lives during the summer. The petitioner requests that the USFWS promptly designate critical habitat for the Indiana bat throughout its summer range.

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The above petitioners formally request that the United States Fish and Wildlife Service (“USFWS”) designate critical habitat for the summer habitat of the Indiana bat (*Myotis sodalis*) under the federal Endangered Species Act, 16 U.S.C. §§1531-1544. This petition is filed under 5 U.S.C. §553(e), 16 U.S.C. §1533(b)(3)(D) and 50 C.F.R. part 424.14. USFWS has jurisdiction over this petition. This petition sets in motion a specific process as defined by 50 C.F.R. part 424.14, placing time-definite response requirements on the USFWS.

This petition presents evidence that (1) current critical habitat designations and other protections have not halted the decline in Indiana bat populations, and therefore a revision to this designation is prudent, and (2) knowledge of the Indiana bat’s summer habitat is sufficiently developed to make the designation of critical habitat determinable.

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## I. PETITIONERS

The Southern Appalachian Biodiversity Project (“SABP”) is a nonprofit organization that specializes in protecting public lands and endangered species. SABP members are concerned with protecting the Indiana bat and all other threatened or endangered species and the species’ habitats.

Kentucky Heartwood, Inc. is a grassroots, non-profit, all-volunteer forest watch organization for Kentucky’s public forests. We advocate that Kentucky’s public lands be managed to preserve and enhance biodiversity, clean watersheds, and wilderness-quality recreation opportunities. We focus our efforts primarily on the Daniel Boone National Forest, which is documented habitat for the Indiana Bat. We are interested in seeing the Indiana Bat’s summer habitat protected because this animal is a summer resident of the Daniel Boone whose survival is threatened by industrial extraction and development. It is in our interests to see that this specie’s year-round habitat is protected in the interests of maintaining biodiversity on the Daniel Boone National Forest.

Brent Bowker was born in Knoxville, Tennessee, where he spent the first 22 years of his life. Brent enjoys outdoor recreation in east Tennessee and western North Carolina. He currently resides in New York City, where he is a student at Columbia University. Brent has an interest in the increased protection of the Indiana bat. Indiana bats are known to hibernate in Blount County, which is adjacent to his home county. Also, Indiana bats roost in western North Carolina. Like all species, the Indiana bat plays an important role in the natural ecosystem. The loss of any species could upset millions of years of evolutionary balance, which could have ripple effects throughout the area. The continued decline of the Indiana bat population will impair Brent’s interests.

The Indiana Forest Alliance was formed to protect and promote the health and well-being of Indiana s forests and public lands, including the plant and animal species therein, now and for future generations. The Indiana Forest Alliance functions as a statewide cooperative network of groups and individuals working to provide accurate information to the people of Indiana and to involve them in efforts to protect and restore Indiana's forests. Our membership consists of over 1000 individuals who frequently use Indiana s forests for hiking, boating, biking, fishing, hunting, birding, nature study, camping, solitude, teaching, and/or various other on and off site activities. Many Indiana Forest Alliance members live next to the boundary of public forest property. The Indiana Forest Alliance is an incorporated 501(c)(3) non-profit and is run completely by volunteers.

Buckeye Forest Council .....

Virginia Forest Watch advocates for protection of the private and public forestland in Virginia. Since 1998, VAFW has monitored Forest Service activities on the George Washington and Jefferson National Forests, seeking strong protection for the ecological benefits of intact forests. Members of VAFW range from weekend and vacation campers on the National Forests, to inholders whose water supply comes from NF land. VAFW activists share a concern for the preservation of plant and animal species, especially those that are rare, threatened and endangered, such as the Indiana Bat. As the eastern edge of the known Indiana Bat range, Virginia's public forests are critically important for maintaining genetic diversity. VAFW's members strongly support the designation of these forests as critical habitat.

Shenandoah Ecosystems Defense Group (SEDG) has been active with public lands forest protection since 1995. Based in Charlottesville, Virginia, SEDG’s actions are concentrated on the George Washington and Jefferson National Forests. SEDG is especially interested and concerned

with the preservation and restoration of old growth, roadless areas, watersheds, and populations of Threatened, Endangered, and other rare species. Members of SEDG benefit from and visit the George Washington and Jefferson National Forests for a variety of recreational, scientific, educational, aesthetic, and spiritual reasons. Indiana Bats are significant components of our environment. Harm to the Bats is unnecessarily harmful to our environment and in turn harms the interests of SEDG and its members. Protection of summer critical habitat for the Indiana Bats will in turn benefit members of SEDG and all those visitors to the National Forests who benefit from the amenities provided by wild nature.

Heartwood is an Indiana nonprofit corporation. Heartwood is organized for the purpose, *inter alia*, of protecting biodiversity and ecosystem integrity on public and other forested land in the central hardwood region of the Continental United States. Heartwood has worked on the conservation of Indiana bats for several years.

## II. SPECIES DESCRIPTION

### a. Overview

The Indiana bat (*Myotis sodalis*) is a medium-sized<sup>1</sup> bat with no subspecies (USFWS 1999a). It originally ranged across much of the eastern United States (Miller 1996), and has been found in 27 eastern states, although over half<sup>2</sup> of all Indiana bats live in Indiana (USFWS 1999a).

*M. sodalis* has pinkish-brown fur on its back with lighter fur on its chest and belly. *Id.* The ears and wings have a dull coloration that does not contrast with the fur. *Id.* “This species closely resembles the little brown bat (*M. lucifugus*) and the northern long-eared bat (*M. septentrionalis*).” *Id.*

### b. Habitat

Indiana bats hibernate in caves and mines from October through April, usually returning to the same hibernacula each year (USFWS 1999). Approximately 87% of the total Indiana bat population use 7 hibernacula, while 50% use two hibernacula (Romme *et al.* 1995).

After hibernating, the Indiana bats emerge and migrate to their summer habitat. Females usually migrate north and establish nursery colonies, which typically contain up to 200 Indiana bats.<sup>3</sup> *Id.* “Based upon limited sampling efforts, northern Indiana, southern Michigan, Illinois, northern Missouri, and southern Iowa apparently have the densest concentrations of reproductive females in summer.” *Id.* However, adult males often are found roosting near their hibernacula in summer. *Id.*

Further, “Riparian and upland forest habitats provide dead or dying trees with exfoliating bark as potential maternal roost sites for Indiana bat females. Several tree species, such as shagbark hickory (*Carya ovata*), can also be used as roosts when they are living. The space between the bark and the trunk on dead and certain live trees provides conditions favorable for roosting.” (Miller 1996).

It is essential to note that dead or dying trees are not necessary for exfoliating bark; old trees often develop this characteristic, also cavities. The IBat radio-tracked in VA used a large (24” dbh, 98’ tall) living shagbark hickory as a roost. This tree was in a “stand” 80+ years old of

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1 The Indiana bat is approximately 41 to 49 mm long and has a forearm length of 35 to 41 mm.

2 182,000 in 1997.

3 Nursery colonies contain 25 to 100 adult females and their young. Females typically produce one offspring per year (Romme *et al.* 1995).

Forest Type 53 (WO-RO-H). (USFS 1997). White oak, northern red oak, and chestnut oak are “Class 1” trees along with shagbark hickory and commonly occur across the GWJNFs.

### III. STATUTORY REQUIREMENTS

The Endangered Species Act (“ESA or Act”), 16 U.S.C. § 1531 to 1544, gives the USFWS the authority to protect species that are in peril. The ESA states:

[T]o the *maximum extent* prudent and determinable the Secretary ... shall, concurrently with making a determination ... that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat; and ... may, from time-to-time thereafter as appropriate, revise such designation. 16 U.S.C. § 1533(a)(3) (emphasis added).

In addition, the “the Secretary shall designate critical habitat, and make revisions thereto, ... on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat.” 16 U.S.C. § 1533(B)(2).

Further, this petition requires a response within 90 days from the U.S. Fish and Wildlife Service:

[t]o the maximum extent practicable, within 90 days after receiving the petition of an interested person under section 553(e) of title 5, United States Code, to revise a critical habitat designation, the Secretary shall make a finding as to whether the petition presents substantial scientific information indicating that the revision may be warranted. The Secretary shall promptly publish such finding in the Federal Register. 16 U.S.C. 1533(b)(3)(D)(i)

The ESA defines critical habitat as:

[T]he specific areas within the geographical area occupied by the species ... on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection [and] specific areas outside the geographical area occupied by the species at the time it is listed. 16 U.S.C. § 1532(5)(A).

Once the Secretary decides that critical habitat should be designated for a species, he must determine which physical and biological features are essential to the conservation of the species and

that may require special management considerations or protection. These include, but are not limited to:

- (1) Space for individual and population growth, and for normal behavior;
- (2) Food, water, air, light, minerals, or other nutritional or physiological requirements;
- (3) Cover or shelter;
- (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally;
- (5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. 50 C.F.R. 424.12(b).

Careful consideration by the Secretary must also be given to the designation of critical

habitat outside of the area currently occupied by a given species. 50 C.F.R. 424.12(e).

#### **IV. PREVIOUS FEDERAL ACTION**

The Indiana bat was first listed as an endangered species March 11, 1967, 32 Fed. Reg. 4001, under the Endangered Species Preservation Act of October 15, 1966. 80 Stat. 926; 16 U.S.C. 668aa(c). This protection continued when Congress enacted the Endangered Species Act of 1973. 16 U.S.C. §§ 1531 to 1544. The USFWS designated critical habitat for the Indiana bat on September 24, 1976. 41 Fed. Reg. 41914. The critical habitat designation is exclusively the Indiana bat's winter hibernacula, and consists of eleven caves and two mines in six states. *Id.* The critical habitat sites are: Bat Cave in Carter County, Kentucky; Coach Cave, Edmonson County, Kentucky; White Oak Blowhole Cave in Blount County, Tennessee; the Blackball Mine in LaSalle County, Illinois; Cave 021, Crawford County, Missouri; Cave 009, Franklin County, Missouri; Cave 017, Franklin County, Missouri; Pilot Knob Mine, Iron County, Missouri; Bat Cave, Shannon County, Missouri; Cave 029, Washington County, Missouri; and Hellhole Cave, Pendleton County, West Virginia. The USFWS declined to designate critical habitat for the Indiana bat's summer territory, which is where it roosts, bears its young, and forages for food. In the 1999 draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan, the USFWS admitted that "it is evident that these measures have not produced the desired result of recovery of the species." (USFWS 1999a).

#### **V. CRITICAL HABITAT**

##### **a. Expanded Critical Habitat is Necessary**

Populations of the Indiana bat continue to decline despite the 1976 designation of critical habitat by the USFWS. One of the earliest documented population estimates was as high as 700,000. *Sierra Club v. Froehlke*, 534 F. 2d 1289, 1303 (8th Cir. 1976) The most recent range-wide data estimate that the total Indiana bat population is 353,000 individuals (USFWS 1999a). The population decreased 28% between 1960 and 1975, which was a period before the USFWS designated any critical habitat (Romme *et al.* 1995). The USFWS' designation of most major Indiana bat hibernacula as critical habitat in 1976, 41 Fed. Reg. 41914, has failed to stabilize the Indiana bat population or to halt population decreases. Today's population is only 60% of the 1980 population<sup>4</sup>. Missouri populations have been devastated, decreasing 80% from over 300,000 individuals in 1980 to an estimated 47,000 in 1997 (USFWS 1999a). Indiana bat populations in Kentucky have also fared poorly, declining from 241,335 in 1960 to 61,370 in 1997 (USFWS 1999a).

Even in Priority 1 hibernacula (protected caves with recorded winter populations exceeding 30,000 bats) the species continues to decline. A 19-year survey of populations in eight of the nine sites designated as Priority 1 hibernacula found that although the Priority 1 critical habitat *sites* are, for the most part, intact and protected, the number of individual Indiana bats has declined steeply and steadily (U.S. Fish and Wildlife Service 2001). Figure 1 demonstrates the general trend observed by Clawson during his 2001 survey. All sites demonstrate overall declines in population size from 1983 through 2001, and the average number of individuals observed also shows steady decline (from an average of 28,300 individuals in 1983 to 13,924 individuals, less than half the 1983 number, in 2001). Regression analysis supports the data, indicating a

statistically significant decline in population size in these protected sites (U.S. Fish and Wildlife Service 2001).

Research indicates that species survival may depend on preservation of currently unprotected summer reproductive habitat (Romme *et al.* 1995). “Deforestation for agriculture, surface strip-mining, road and utility construction, urban expansion and a host of other ‘progress’-related developments all adversely affect the continued existence of *M. sodalist* throughout its range” (Gardner *et al.* 1990). Pesticides likely contribute to the decline of insectivorous bats like the Indiana bat *Id.*

Because there is no designated critical habitat in the Indiana bat’s summer range, the USFWS continues to issue incidental take statements throughout the country, allowing many Indiana bats to be killed. For example, in southern Indiana, the USFWS allowed the permanent destruction of 121 ha of forest habitat in an area that has the highest known concentration of Indiana bat maternity roosts in the world (USFWS 1998). If the current protections fail to protect even this important area, expanded critical habitat is necessary.

These data show that the USFWS must revise the critical habitat designation for the Indiana bat to provide the increased protection necessary to reverse the trend of population decline. The current critical habitat designation for the Indiana bat is having no positive effect on the species’ survival.

Research demonstrates that the pressure exerted on the survival of the Indiana bat comes from activities occurring *outside* of protected, wintering hibernacula, and that revision of critical habitat designations is over-due; advances in the study of Indiana bat populations (Murray *et al.* 1999) and the knowledge of Indiana bat summering habitat (Romme *et al.* 1995, Humphrey *et al.* 1997, and USFWS 1999a) provide for revision to the critical habitat designation with out delay.

#### **b. Indiana Bat Habitat is Determinable**

The first Indiana bat maternity colony was discovered on August 3, 1971 in Indiana in a dead American elm that was bulldozed to the ground. (Romme *et al.* 1995). In 1974 a second maternity colony was found. *Id.* Subsequently, the first major paper on Indiana bat summer habitat was published in 1977. (Humphrey *et al.* 1997). Because the USFWS first designated critical habitat for the Indiana bat in 1976, prior to the Humphrey paper, there was no way to determine the Indiana bat’s summer habitat.

However, in the intervening 25 years scientists have gained much knowledge of Indiana bat summer habitat. (*See* Romme *et al.* 1995). In addition, the USFWS itself has compiled extensive records of the Indiana bat’s summer habitat locations in the Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. (USFWS 1999a). Furthermore, ultrasonic bat detectors have made it easier for researchers to find Indiana bats and their roosts. (Murray *et al.* 1999). Because in the change in knowledge concerning the Indiana bat’s summer habitat since 1996, it is necessary that the USFWS designate summer habitat for the Indiana bat.

#### **c. Characteristics of the Necessary Critical Habitat**

This petition requests the designation of critical habitat for the “summer habitat” of the Indiana bat. For the purposes of this petition, “summer habitat” refers to any area outside of the Indiana bat’s winter hibernacula, including adjacent areas used in the fall for foraging, roosting, and mating.

Essential habitat is described as areas with greater than or equal to 30% deciduous forest cover and water within 0.6 miles (1 km). (Romme *et al.* 1995). Optimal habitat will have greater than 60% canopy cover. Id. “Gardner *et al.* (1991) found 73% of 44 maternity roosts in areas with over 80% canopy cover, 27% in areas with 30%-80% canopy cover, and 0% in areas with less than 30% canopy cover.” Id. Optimal habitat also has more than 27 trees  $\geq$  8.7 inches per acre, although suitable habitat can have as little as one tree greater than 8.7 inches in an acre. Id.

Indiana bats will return to the same site summer after summer. (Garner and Gardner 1992). However, roost trees are ephemeral, lasting only one to eight years. (USFWS 1999a). Thus, critical habitat designations must constitute significant acreage of forested areas to provide a variety of possible roost trees year after year.

## VI. RECOMMENDED CRITICAL HABITAT

Petitioners note at the outset that this list does not purport to be absolutely complete, but that it generally indicates the range of maternity colonies.

### a. Area Surrounding Hibernacula Currently Designated as Critical Habitat

In 1976, the USFWS designated critical habitat for the Indiana bat in eleven caves and two mines in six states. “During the fall ‘swarm,’ male Indiana bats roost in trees during the day. In Kentucky, male [Indiana] bats have been found roosting primarily in dead trees on upper slopes and ridgetops within 1.5 [miles] of their hibernaculum” (USFWS 2000). In West Virginia, male Indiana bats have been found in ridgetops within 3.5 miles of their hibernaculum. Id.

The importance of properly identifying and managing the habitat associated with *Myotis sodalis* pre-hibernation foraging areas is critical --- especially when one realizes that the adult male cohort is engaged in an extremely energy demanding activity (i.e. swarming and mating), while concurrently accumulating sufficient body fat with which to successfully overwinter. (Kiser and Elliott 1996).

**Given these results, the areas around hibernacula used by males for “swarming” must be considered for critical habitat designation.**

### b. Illinois

Illinois is within the summer range of the Indiana bat. Maternity colonies have been discovered in 24 Illinois counties,<sup>4</sup> while other summering Indiana bats have been located in seven additional counties.<sup>5</sup> (USFWS 1999a). The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Illinois should be designated as critical habitat.<sup>6</sup> Other specific Illinois sites are detailed below.

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<sup>4</sup> Adams, Alexander, Bond, Cass, Clay, Edwards, Ford, Henderson, Jackson, Jersey, Johnson, Lawrence, Macoupin, McDonough, Perry, Pike, Pope, Pulaski, Saline, Schuyler, Scott, Union, Vermilion, and Wabash counties.

<sup>5</sup> Christian, Cooke, Hardin, LaSalle, Monroe, Morgan, and Sangamon counties.

<sup>6</sup> Optimal Indiana bat habitat has greater than 60% canopy cover, has more than 27 trees  $\geq$  8.7 inches per acre, and is within 0.6 miles of a water source (Romme *et al.* 1995).

There have been extensive studies of Indiana bat summer roosting habitat in Illinois, and consequently, there is a great deal of known roosting areas. “In Illinois juvenile and reproductively active adult female *M. sodalis* have been reported from Adams, Bond, Jackson, Johnson, Perry, Pike, Pulaski, Schuyler, Scott, Union, and Wabash/Edwards counties.” (Garner and Gardner 1992). There are records of adult males in Adams, Christian, Cook, Hardin, McDonough, Madison, Morgan, and Sangamon counties. *Id.* Indiana bats used fourteen tree species for roosts in Illinois: *Ulmus rubra* (slippery elm), *Ulmus americana* (American elm), *Quercus rubra* (northern red oak), *Quercus stellata* (post oak), *Quercus alba* (white oak), *Quercus imbricaria* (shingle oak), *Carya ovata* (shagbark hickory), *Carya cordiformis* (bitternut hickory), *Carya ovalis* (sweet pignut hickory), *Acer saccharinum* (silver maple), *Acer saccharum* (sugar maple), *Populus deltoides* (cottonwood), *Fraxinus pennsylvanica* (green ash), and *Sassafras albidum* (sassafras). *Id.*

A study by the scientists James Garner and James Gardner, conducted from 1986 through 1990, discovered more than 340 Indiana bats “roosting in 51 different trees in nine Illinois counties.” *Id.* Thirty-two of the roost trees were found in forested areas with 80-100% canopy closure, indicating the importance of heavily forested areas for Indiana bat summer habitat. The USFWS should designate critical habitat in the forests surrounding all 51 roost trees discovered by Garner and Gardner in Illinois.

The majority of the roost trees, 38 in total, were found in the Fishhook Creek area in Pike and Adams counties. *Id.* The study also documented that some “roosts within the Fishhook Creek study area were used by *M. sodalis* during successive summers, documenting their significance as traditional roost sites.” *Id.* Because of the extremely high number of roost trees known in Pike and Adams counties, and the evidence that Indiana bats repeatedly return to these areas each summer, the USFWS should designate critical habitat in all forested areas within Pike and Adams counties, Illinois.

The Shawnee National Forest is 265,135 acres of federally-owned land in southern Illinois. Pope, Saline, Union, and Williamson Counties contain the Shawnee. The Indiana bat’s range includes the entire Shawnee, and surveyors have captured Indiana bats within the Shawnee. (USFWS 1992). Studies locate both summer and fall roosts in the Shawnee and on private inholdings in the Shawnee. Because the Shawnee contains a large tract of federally-owned land where Indiana bats are known to summer, the USFWS must designate critical habitat within all or a majority of the Shawnee National Forest.

The Sugar Creek area is located in Williamson and Johnson Counties, Illinois. In 1995, the USFWS approved the complete destruction of “10.3 linear miles of forested riparian corridor and 455 acres of optimal foraging and suitable roosting Indiana bat habitat” in the Sugar Creek area. (USFWS 1995). Because of the extensive elimination of Indiana bat habitat in the Sugar Creek area, it is imperative that the USFWS designate critical habitat on all remaining optimal and suitable Indiana bat habitat in Williamson and Johnson Counties, Illinois.

In 1998, the USFWS approved the destruction of 231 acres of Indiana bat habitat near Georgetown, Illinois along the Little Vermilion River. (USFWS 1998a). “An Indiana bat was netted and released in 1994 at a site just downstream of Georgetown. In 1990, a post-lactating female was captured and tracked to a couple of roost trees.” *Id.* The USFWS determined that it is likely that Indiana bats use the area for roosting and foraging, and there existed optimal foraging habitat. Despite this, the USFWS authorized the destruction of 20% of the Indiana bat habitat in the Georgetown area. The remaining habitat is subject to pressure from cuts, clearing, grazing, and fire suppression. *Id.* Because of the loss of Indiana bat habitat in this area, the USFWS

should designate the remaining Indiana bat habitat in the Georgetown area as critical habitat to protect the Indiana bats who use this area for summer and fall roosting and/or foraging.

**c. Iowa**

Iowa is within the summer range of the Indiana bat. Maternity colonies have been discovered in 13 Iowa counties,<sup>7</sup> while other summering Indiana bats have been located in two additional counties.<sup>8</sup> (USFWS 1999a). The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Iowa should be designated as critical habitat.<sup>9</sup>

**d. Indiana**

The Indiana bat's namesake state contains the largest hibernating population of Indiana bats, numbering approximately 182,510. (USFWS 1999a). Because of the high numbers of Indiana bats present, Indiana is an important state for Indiana bat recovery. Maternity colonies have been discovered in 38 Indiana counties,<sup>10</sup> while other summering Indiana bats have been located in 11 additional counties.<sup>11</sup> (USFWS 1999a). The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Iowa should be designated as critical habitat.<sup>12</sup> Additional specific sites are discussed below.

Edinburgh, Indiana is located in Bartholomew, Johnson, and Brown counties. Within Edinburgh is the Camp Atterbury Army National Guard Training Site ("Camp Atterbury"). Camp Atterbury is large, consisting of 13,409 ha, of which 10,927 ha is forested. Camp Atterbury is of particular importance to Indiana bat conservation because 13 Indiana bats were captured on Camp Atterbury in 1997. The USFWS has reported that there are a minimum of 5 Indiana bat maternity colonies on Camp Atterbury, each of which could contain 100 female and 100 juvenile Indiana bats.

This would not include any adult males or non-reproductive females that are also present. "Camp Atterbury supports one of the highest known concentrations of Indiana bat maternity colonies *within the entire range of the species.*" (USFWS 1998b) (emphasis added). There is a "relatively large block of forested habitat available to Indiana bats at Camp Atterbury." *Id.*

In order to protect this large Indiana bat population, this petition urges the USFWS to designate Bartholomew, Johnson, and Brown counties, Indiana, as critical habitat for the Indiana bat. If the USFWS declines to designate these entire counties, the USFWS, at an absolute

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<sup>7</sup> Appanoose, Decatur, Iowa, Keokuk, Lucas, Madison, Marion, Monroe, Poweshiek, Ringgold, Van Buren, Wappelo, and Washington counties.

<sup>8</sup> Jasper and Louisa counties.

<sup>9</sup> See note 7.

<sup>10</sup> Boone, Blackford, Clinton, Delaware, Fountain, Fulton, Hendricks, Henry, Howard, Huntington, Jasper, Jay, Jefferson, Jennings, Knox, Kosciusko, LaGrange, Laporte, Marion, Martin, Montgomery, Parke, Pulaski, Putnam, Randolph, Ripley, Rush, Shelby, Stark, Steuben, St. Joseph, Tippecanoe, Vermillion, Vigo, Wabash Warren, Wayne, and Wells counties.

<sup>11</sup> Clark, Clay, Crawford, Greene, Hancock, Harrison, Johnson, Lawrence, Monroe, Morgan and Washington counties.

<sup>12</sup> See note 7.

minimum, must designate the 10,927 ha of forested land on Camp Atterbury as critical habitat to protect this important Indiana bat population.

Another important location for Indiana bats in Indiana is the Newport Chemical Depot (“NECD”), located in the city of Newport in Vermillion County. The USFWS has stated that “due to extensive farming in the counties surrounding the facility, the NECD is particularly important habitat for the bat population utilizing the area.” (USFWS 1999b). The NECD is about 7,100 acres in area, of which 27% is forested. Common trees include oak (*Quercus* spp.) and hickory (*Carya* spp.), which make excellent roosts for Indiana bats. (USFWS 1999b). The NECD contains several small streams that have “very hard and slightly polluted water.” (USFWS 1999b). Critical habitat designation would improve the water quality, which would benefit the Indiana bat and other species. Four areas within the NECD were “determined to contain suitable foraging habitat for the Indiana bat” by PRC Environmental Management, Inc. in 1996. (USFWS 1999b). Searches for Indiana bats were conducted in those four areas.

Two female Indiana bats of undetermined reproductive status were captured above the unnamed creek along the railroad spur, east of the fenced property, and a male and pregnant female Indiana bat were captured along Little Vermillion Creek. A radio-transmitter was attached to a female from each site and the two bats were tracked to two separate roost trees. The bat captured along Little Vermillion Creek was tracked to a dead sugar maple ... west of the Small Arms Range. The other bat, captured along the old railroad spur, was tracked to a dead slippery elm in a woodlot west of the capture location. Dusk counts revealed 21 Indiana bats roosting in the sugar maple, and 16 roosting in the elm. Due to the time of year the dusk counts were conducted, it was assumed that females were pregnant and that the colony size would increase later in the season. Additional surveys were conducted during the summer of 1998. These surveys resulted in several Indiana bats being captured along Little Raccoon Creek on the southern portion of the base. Further surveying and radio-tracking may yield evidence of additional maternity colonies and foraging areas. (USFWS 1999b)(internal citations omitted).

Because the NECD is owned by the U.S. Army, there is a federal nexus that would make it ideal for critical habitat. The lack of other suitable foraging habitat in the neighboring counties makes critical habitat especially important. The USFWS should designate all forested areas and woodlots in the NECD as critical habitat for the Indiana bat. Any additional areas where Indiana bats have been discovered should be critical habitat, as should Little Raccoon Creek and other bodies of water that provide drinking water for the Indiana bat and habitat for its insect prey.

Another area of Indiana that the USFWS should designate as critical habitat for the Indiana bat is the Muddy Fork of Silver Creek watershed. Indiana bats are known to be in this area. (USFWS 1992). The area’s floodplain is 1 mile wide. “Several large acreages of forested wetlands exist, either adjacent to the stream or within the floodplain.” *Id.* The USFWS should designate this area as critical habitat for the Indiana bat.

#### **e. Kentucky**

Kentucky is within the summer range of the Indiana bat. Maternity colonies have been discovered in 12 Kentucky counties,<sup>13</sup> while other summering Indiana bats have been located in

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<sup>13</sup> Bath, Breckinridge, Bullitt, Carlisle, Daviess, Edmonson, Harlan, Hickman, Logan, McCracken, Pulaski, and Union counties.

17 additional counties.<sup>14</sup> (USFWS 1999a). The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Kentucky should be designated as critical habitat.<sup>15</sup> Other specific Kentucky sites are detailed below.

Letcher and Pike counties, Kentucky, contain parts of the George Washington and Jefferson National Forest. Because Indiana bats are known in this forest, the federal land in these counties should be designated critical habitat.

#### **f. Michigan**

Michigan is within the Indiana bat's summer range. Maternity colonies have been located in 7 Michigan counties,<sup>16</sup> while Indiana bats have been located in 5 additional counties.<sup>17</sup> (USFWS 1999a). The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Michigan should be designated as critical habitat.<sup>18</sup>

#### **g. Missouri**

Indiana bat populations in Missouri have steadily dropped since its historic level of 323,120 in 1960. The most recent surveys<sup>19</sup> estimate Missouri populations at 47,135, an 85% decrease from 1980 levels, four years after the USFWS designated winter hibernacula as critical habitat. However, Missouri remains very important for the continued survival of the Indiana bat. Its population is the third largest after Kentucky and Indiana (USFWS 1999a). Summer maternity populations have been found in 16 Missouri counties,<sup>20</sup> while the total Missouri counties with known summering Indiana bats is 30. (USFWS 1999a). Studies show an "unequivocal relationship ... between Indiana bat presence and an abundance of trees with a diameter of at least 30.1 cm" in Missouri (Miller 1996). These areas should be priority for Indiana bat critical habitat. The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Missouri should be designated as critical habitat.<sup>21</sup> Other specific Missouri sites where the USFWS should designate critical habitat are detailed below.

One area where the USFWS should designate critical habitat is Fort Leonard Wood, Missouri in Pulaski County. This area contains over 42,000 acres of oak/hickory forests, which are ideal habitat for the Indiana bat, on federal property, giving the federal nexus that would make critical habitat designation highly effective for protecting the Indiana bat population. The Big Piney River and Roubidoux Creek, which both have high water quality, should be designated as critical habitat to ensure that the Indiana bat has adequate water supply for drinking and for its insect

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14 Calloway, Estill, Fayette, Franklin, Grayson, Hart, Jackson, Jessamine, Lee, Letcher, McCreary, Menifee, Powell, Rockcastle, Rowan, and Trimble counties.

15 See note 7.

16 Branch, Eaton, Hillsdale, Jackson, Livingston, St. Joseph, and Washtenaw counties.

17 Barry, Calhoun, Emmet, Ingham, and Wayne counties.

18 See note 7.

19 Conducted in 1995-1997 (USFWS 1999).

20 Chariton, Clinton, Daviess, Iron, Jefferson, Knox, Linn, Macon, Mercer, Monroe, Nodaway, Pike, Pulaski, Scotland, Sullivan, and Washington Counties, Missouri (USFWS 1999).

21 See note 7.

prey. Both of these streams support food populations that are important for the Indiana bat (USFWS 1996). Dry Creek, located in the northern edge of the area, has poor water quality that would be improved by critical habitat designation. Records show that Indiana bats use Fort Leonard Wood, Missouri for summer maternity colonies, and Indiana bats use the area extensively for fall and spring swarming Id. Fort Leonard Wood, Missouri is important to the Indiana bat's continued survival because there are substantial populations that hibernate in adjacent areas. Its protection is essential because 96% of the area's Indiana bat population has disappeared since 1979, which is a strong indicator that current protections are highly inadequate. Id. As recently as 1979, the Fort Leonard Wood, Missouri area supported more than 19,500 Indiana bats, and with adequate protection through critical habitat designation, the population could once again increase from its current level of only 1,4000 individuals. Id. The proximity of hibernacula, the federal land ownership, the historically high Indiana bat population levels, and the availability of suitable habitat make this area a perfect choice for critical habitat designation.

Adjacent to Fort Wood, Missouri lies the Mark Twain National Forest (MTNF). The MTNF, according to the USFWS, contains a "large number of suitable roost trees" for Indiana bats (USFWS 1999d). Critical habitat is necessary on the MTNF to allow for Indiana bat recovery in Missouri.

Finally, Critical Habitat must be designated in the area around St. Lee's Island on the Mississippi River, in St. Genevieve and Jefferson Counties. The proposed Holnam/St. Lee's Island cement plant in St. Genevieve county 45 miles south of St. Louis could become the largest cement-processing plant in the world. Located on 4,000 acres in the Bricky Hills, it lies adjacent to the Mississippi River and Isle du Bois Creek. This area contains the largest block of bottom land hardwood forest found along the Mississippi in Missouri. The Bricky Hills, a high band of narrow ridges, separated by deep valleys with deep ravines, springs, sinkholes and caves, is a prime habitat for subterranean species as well as many bat species. Its rugged, canyon-like topography has protected the area from development. The Holnam site also includes dolomite glades, sandstone forests, and fens (upland wetlands). Holnam's environmental consultants found no threatened or endangered species on this huge tract of land. Despite Holnam's failures, Fish and Wildlife Service found eighteen Indiana bats and several other listed species, and determined that the cement plant would in fact adversely affect the Indiana bat. USFWS 2002b.

#### **h. Ohio**

Ohio is within the Indiana bat's summer range. People have found Indiana bats in 20 Ohio counties,<sup>22</sup> and six maternity colonies have been discovered.<sup>23</sup> The USFWS should designate critical habitat for the Indiana bat where suitable habitat is located in each of these counties. Additionally, all optimal Indiana bat summer roosting and foraging habitat throughout Ohio should be designated as critical habitat.<sup>24</sup>

#### **i. Pennsylvania**

The Allegheny National Forest ("ANF") is located on 513,000 acres in northwestern Pennsylvania within Elk, McKean, Forest, and Warren counties. Suitable Indiana bat summer roosting and foraging habitat occurs throughout the entire Allegheny. (Gannon 1999). In the

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<sup>22</sup> Butler, Champaign, Clermont, Columbiana, Darke, Delaware, Franklin, Green, Hamilton, Highland, Hocking, Lake, Lucas, Madison, Miami, Paulding, Pike, Richland, Scioto, and Warren counties.

<sup>23</sup> These colonies were located in Butler, Champaign, Clermont, Darke, Hamilton, and Warren counties.

<sup>24</sup> See note 7.

summer of 1998, researchers surveyed for Indiana bats using mist nets and Anabat II ultrasonic bat detectors. One Indiana bat was captured via mist netting near a pond along Mill Creek within the ANF. The Anabat II detectors located 189 Indiana bat calls. The three areas of the forest with the most Indiana bat activity are “in the southeast near Ridgeway, in the northeast near Hamilton, and northwest near Chapman State Park and McKean Corners.” *Id.* The high number of calls near Mill Creek “could possibly indicate a roosting site or colony nearby.” *Id.* “Habitat within 2 km of [the Ridgeway] site is comprised primarily of mixed hardwoods, with approximately two-thirds of the acreage characterized as forests 50+ years old and greater than or equal to 60 percent stocked.” (USFWS 1999c). This area is prime Indiana bat summer habitat and must be conserved as critical habitat. Indiana bats were unknown within the Allegheny prior to the 1998 survey. (Gannon 1999). The USFWS states that there are a “large number of suitable roost trees present on the ANF.” (USFWS 1999c). Because of the high level of documented Indiana bat activity and its federal nexus, the USFWS should designate the Allegheny National Forest as critical habitat for the Indiana bat.

#### **j. Tennessee and North Carolina**

The presence of the White Oak Blowhole Cave, an Indiana bat hibernaculum designated as critical habitat, and recent discoveries of summer maternity roosts and individual summering bats compels the Fish and Wildlife Service to consider areas in Monroe, Sevier, and Blount Counties, in Tennessee and Graham, Macon, Mitchell, Swain, and Cherokee Counties in North Carolina as Indiana bat critical habitat. The White Oak Blowhole Cave is located in Blount County, Tennessee, inside the Great Smoky Mountains National Park (USFWS 2000).

In July, 1999, three individual Indiana bats were captured in Graham County, North Carolina within 25 miles of the White Oak Blowhole Cave. *Id.* That same month, a summer maternity colony containing 28 Indiana bats was discovered in a dead Canadian hemlock in the Nantahala National Forest in western North Carolina. *Id.* Indiana bats have also been discovered summering in Mitchell and Swain Counties in North Carolina (USFWS 1999). The USFWS has stated that Indiana bats could be anywhere in Graham County, and are probably in Macon and Cherokee Counties as well, although there have been inadequate attempts to locate Indiana bats in these North Carolina counties. “A lactating female was captured in Monroe County, Tennessee, on June 30, 1999. Because this bat was captured more than 15 mi. from the Graham County, North Carolina, maternity site, it likely came from a different maternity colony.” (USFWS 2000). An Indiana bat was also found in Sevier County, Tennessee (USFWS 1999).

The federal nexus in these five counties is significant. The Nantahala and Pisgah National Forests in western North Carolina contain 17,140 acres of suitable Indiana bat habitat within 20 miles of the White Oak Blowhole Cave, much of which would be ideal for critical habitat (USFWS 2000). Part of the Cherokee National Forest is located in Monroe County, Tennessee, while portions of the Great Smoky Mountains National Park are in Blount and Sevier Counties in Tennessee. The USFWS must designate significant portions of these counties that contain suitable roosting, foraging, and maternity habitat for the Indiana bat as critical habitat to ensure that the populations that use these counties are protected. It is imperative that the USFWS include all habitat within this range that is optimal Indiana bat habitat.<sup>25</sup>

#### **k. Virginia and West Virginia**

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<sup>25</sup> See *supra* note 7.

The George Washington and Jefferson National Forests (“GWJNF”) consist of 31 counties in Virginia<sup>26</sup> and four counties in West Virginia.<sup>27</sup> These areas are within the Indiana bat’s summer range. On the GWJNF there are 4 known hibernacula. These are on the Warm Springs (Mt. Grove Saltpetre and Starr Chapel Caves in Bath County), New Castle (Shires Cave in Craig County), and Clinch (Kelly Cave) Ranger Districts. Shires Cave is 4 miles from the James River RD. Mountain Grove Saltpetre Cave is 10 miles from the James River RD and 4 miles from the Monongahela NF in West Virginia. Starr Chapel Cave is 7-8 miles from the Deerfield RD. The Indiana bat’s population has plummeted in VA since cave surveys began. The total number of Bats has dropped 70% from the first census to the latest for each cave (1835 to 559). (USFS, 1997).

An Indiana bat was observed using a shagbark hickory as a roost in the Warm Springs Ranger District of the GWJNF in the spring of 1993. (USFWS 1997). Rocky Hollow Cave, which is adjacent to the Clinch Ranger District, supports one of the largest Indiana bat populations in Virginia, illustrating the importance of the GWJNF for Indiana bat habitat. Furthermore, Hellhole Cave, located in Pendleton County, West Virginia, is only 15 miles from the GWJNF and contains approximately 10,470 Indiana bats. A single male was also captured in Highland county, Virginia, near the GWJNF and the Cumberland Gap National Historic Park.

Five adult male Indiana bats and one immature male were captured in western Virginia in the summer of 1992. These Indiana bats were all within the Cumberland Gap National Historic Park (“CGNHP”). *Id.* The juvenile male was captured in the Station Creek area of CGNHP, while the five adults were captured near Station Creek and Lewis Hollow Branch within CGNHP. *Id.* The capture of the juvenile indicates that there were probably nursing females using the area for summer maternity roosts. *Id.* The Salpeter Cave, located near CGNHP on private land, harbors the largest Indiana bat winter population in Virginia. *Id.* This makes the protection of the summer habitat nearby on the CGNHP and GWJNF critical.

On the GWJNF, the Skydusky Hollow Cave System, located on the north side of Big Walker Mountain in Bland County, is rich in biological diversity. Seven species of bats have been documented in the system, including two federally endangered species that hibernate in the system’s central cave, Newberry-Banes Indiana bat (*Myotis sodalis*) and the Virginia Big-Eared Bat (*Corynorhinus townsendii*). The entrance to Newberry-Banes cave is just over one mile from the preferred corridor, with the closest passage well under a mile in proximity. It has been estimated that Skydusky Hollow has approximately 16,000 bats in hibernacula in the cave system, not counting summer visitors. This represents approximately one-quarter of the entire bat population in Virginia.

With 16,000 bats in a relatively small area, there is increased pressure on the bat habitat and surface resources. In comparison with typical locations in Virginia with fewer bats, these bats will fly much farther to locate necessary resources. All regulations based on distances to a cave or roost of an endangered and/or sensitive species must therefore be significantly increased. For example, the federal requirement of no take within    mile of a hibernaculum must be increased to at least 2 to 3 miles.

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<sup>26</sup> Bedford, Carroll, Dickenson, Grayson, Montgomery, Roanoke, Rockbridge, Scott, Wise, Washington, Frederick, Warren, Shenandoah, Page, Rockingham, Augusta, Highland, Bath, Allegheny, Rockbridge, Amherst, Lee, Nelson, Smyth, Wythe, Bland, Tazewell, Pulaski, Giles, Craig, and Botetourt counties, Virginia.

<sup>27</sup> Hardy, Hampshire, Pendleton, and Monroe counties, West Virginia. The two Kentucky counties within the GWJNF are discussed previously.

The Indiana bat population in the Skydusky Hollow hibernaculum is at least a stable population, inventoried in February of 2000 at 235 individuals. This is in sharp contrast to most Indiana bat caves in the state, in which populations are on the decline. This stability makes protection of this cave and the area around it essential to the protection of the species.

The USFWS should designate all of the CGNHP and GWJNF as critical habitat for the Indiana bat. While these areas may not represent the totality of suitable summer Indiana bat habitat, the federal ownership makes these areas the most prudent locations for critical habitat designation. The most important areas include the Clinch and Warm Springs Ranger Districts in the GWJNF and the Station Creek and Lewis Hollow Branch areas in the CGNHP. The USFWS should also designate the most optimal Indiana bat habitat on private land throughout Virginia to ensure the survival of the Indiana bat in Virginia and elsewhere.

## **VII. CONCLUSION**

For the reasons set forth above, Petitioners request that the USFWS revise its determination that designation of critical habitat for the Indiana bat and issue a proposed rule designating Indiana bat critical habitat in its summer range.

Respectfully submitted for the Indiana bat and all Petitioners,

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