(5) *Contractor actions to support forensic analysis and preliminary damage assessment.* In response to the reported cyber incident, the Contractor shall—

(i) Conduct an immediate review of its unclassified network for evidence of intrusion to include, but is not limited to, identifying compromised computers, servers, specific data and users accounts. This includes analyzing information systems that were part of the initial compromise, as well as other information systems on the network that were accessed as a result of the initial compromise.

(ii) Review the data accessed during the cyber incident to identify specific DoD information associated with DoD programs, systems or contracts, including military programs, systems and technology.

(iii) The Contractor shall preserve and protect images of known affected information systems and all relevant monitoring/packet capture data until DoD has received the image and completes its analysis, or declines interest.

(iv) Cooperate with the DoD Damage Assessment Management Office (DAMO) to identify systems compromised as a result of the incident.

(v) Provide points of contact to coordinate damage assessment activities.

(6) *Damage assessment activities.* DAMO may conduct a damage assessment. If it is determined that the incident requires a damage assessment, DAMO will notify the Contractor to provide digital media and a point of contact to coordinate future damage assessment activities. The Contractor shall comply with DAMO information requests.

(g) *Protection of reported information.* Except to the extent that such information is publicly available, DoD will protect information reported or otherwise provided to DoD under this clause in accordance with applicable statutes, regulations, and policies (e.g., Critical Program Information, Operations Security, International Traffic in Arms Regulations, Export Administration Regulations, Freedom of Information Act, For Official Use Only, Sensitive But Unclassified, Limited Distribution, Proprietary, Originator Controlled, Law Enforcement Sensitive, Personally Identifiable Information, Privacy Act, and Health Insurance Portability and Accountability Act).

(1) The Contractor and its subcontractors shall mark attribution information reported or otherwise provided to the Government. The Government may use attribution information and disclose it only to authorized persons for cyber security and related purposes and activities pursuant to this clause (e.g., in support of forensic analysis, incident response, compromise or damage assessments, law enforcement, counterintelligence, threat reporting, trend analyses). Attribution information is shared outside of DoD only to authorized entities on a need-to-know basis as required for such Government cyber security and related activities. The Government may disclose attribution information to support contractors that are supporting the Government's cyber security and related activities under this clause only if the support contractor is subject to legal confidentiality requirements that prevent any further use or disclosure of the attribution information.

(2) The Government may use and disclose reported information that does not include attribution information (e.g., information regarding threats, vulnerabilities, incidents, or countermeasures at its discretion to assist entities in protecting information or information systems (e.g., threat information products, threat assessment reports); provided that such use or disclosure is otherwise authorized in accordance with applicable statutes, regulations, and policies.

(h) Nothing in this clause limits the Government's ability to conduct law enforcement or counterintelligence activities, or other lawful activities in the interest of national security. The results of the activities described in this clause may be used to support an investigation and prosecution of any person or entity, including those attempting to infiltrate or compromise information on a Contractor information system in violation of any statute.

(i) *Third party information.* If providing or sharing information is barred by the terms of a nondisclosure agreement with a third party, the Contractor will seek written permission from the owner of any third-party data believed to be contained in images or media that may be shared with the Government. Absent the written permission, the third-party information owner may have the right to pursue legal action against the Contractor (or its subcontractors) with access to the nonpublic information for breach or unauthorized disclosure.

(j) *Subcontracts.* The Contractor shall include the substance of this clause, including this paragraph (j), in all subcontracts under this contract that may have unclassified DoD information that requires enhanced protection. In altering this clause to identify the appropriate parties, the Contractor shall modify the reporting requirements to include notification to the prime Contractor or the next higher tier in addition to the reports to the DoD as required by paragraph (f) of this clause.

(End of clause)

[FR Doc. 2011–16399 Filed 6–28–11; 8:45 am]

BILLING CODE 5001–08–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R5–ES–2011–0024; MO 92210–0–0008]

Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To List the Eastern Small-Footed Bat and the Northern Long-Eared Bat as Threatened or Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of petition finding and initiation of status review.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90-day finding on a petition (Petition) to list the eastern small-footed bat (*Myotis leibii*) and the northern long-eared bat (*Myotis septentrionalis*) as endangered or threatened under the Endangered Species Act of 1973, as amended (Act), and designate critical habitat. Based on our review, we find that the Petition presents substantial scientific or commercial information indicating that listing of the eastern small-footed bat and the northern long-eared bat may be warranted. Therefore, with the publication of this notice, we are initiating a review of the status of these species to determine if listing the eastern small-footed bat or the northern long-eared bat, or both species is warranted. To ensure that this status review is comprehensive, we are requesting scientific and commercial data and other information regarding these species. Based on the status review, we will issue a 12-month finding on the Petition, which will address whether the petitioned action is warranted, as provided in the Act.

DATES: To allow us adequate time to conduct this review, we request that we receive information on or before August 29, 2011. Please note that if you are using the Federal eRulemaking Portal (see **ADDRESSES**), the deadline for submitting an electronic comment is Eastern Standard Time on this date. After August 29, 2011, you must submit information directly to the Field Office (see **FOR FURTHER INFORMATION CONTACT**). Please note that we might not be able to address or incorporate information that we receive after the above requested date.

ADDRESSES: You may submit comments by one of the following methods:

Electronically: Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Keyword box, enter Docket No. FWS–R5–ES–2011–0024, which is the docket number for this finding. Follow the instructions for submitting comments on this docket.

By hard copy: Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R5–ES–2011–0024; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We will not accept e-mails or faxes. We will post all information we receive on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us, See Request for Information below for more information.

FOR FURTHER INFORMATION CONTACT: Clint Riley, Field Supervisor, Pennsylvania Ecological Services Field Office, 315 South Allen Street, Suite 322, State College, PA 16801; by telephone at 814–234–4090, or by facsimile at 814–234–0748. If you use a telecommunications device for the deaf (TDD), please call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Request for Information

When we make a finding that a petition presents substantial information indicating that listing a species may be warranted, we are required to promptly review the status of the species (status review). For the status review to be complete and based on the best available scientific and commercial information, we request information on the eastern small-footed bat and northern long-eared bat from governmental agencies, Native American Tribes, the scientific community, industry, and any other interested parties. We seek information on:

(1) The species' biology, range, and population trends, including:

(a) Habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range including distribution patterns;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species, its habitat, or both.

(2) The factors that are the basis for making a listing determination for a species under section 4(a) of the Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), which are:

(a) The present or threatened destruction, modification, or curtailment of its habitat or range;

(b) Overutilization for commercial, recreational, scientific, or educational purposes;

(c) Disease or predation;

(d) The inadequacy of existing regulatory mechanisms; or

(e) Other natural or manmade factors affecting its continued existence.

(3) Species-specific population data (*e.g.,* hibernaculum counts) pre- and post-exposure to white-nose syndrome (WNS).

If, after the status review, we determine that listing the eastern small-footed bat and or the northern long-eared bat is warranted, we will propose critical habitat (see definition in section 3(5)(A) of the Act), under section 4 of the Act, to the maximum extent prudent and determinable at the time we propose to list the species. Therefore, within the geographical range currently occupied by the eastern small-footed bat and northern long-eared bat, we request data and information on:

(1) What may constitute "physical or biological features essential to the conservation of the species";

(2) Where these features are currently found; and

(3) Whether any of these features may require special management considerations or protection.

In addition, we request data and information on "specific areas outside the geographical area occupied by the species" that are "essential to the conservation of the species." Please provide specific comments and information as to what, if any, critical habitat you think we should propose for designation if the species is proposed for listing, and why such habitat meets the requirements of section 4 of the Act.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or threatened species must be made "solely on the basis of the best scientific and commercial data available."

You may submit your information concerning this status review by one of the methods listed in the **ADDRESSES** section. If you submit information via *http://www.regulations.gov,* your entire submission—including any personal identifying information—will be posted on the Web site. If you submit a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this personal identifying information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *http://www.regulations.gov.*

Information and supporting documentation that we received and used in preparing this finding is available for you to review at *http://www.regulations.gov,* or you may make an appointment during normal business hours at the Service's Pennsylvania Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Background

Section 4(b)(3)(A) of the Act (16 U.S.C. 1533(b)(3)(A)) requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. We are to base this finding on information provided in the petition, supporting information submitted with the petition, and information otherwise available in our files. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish our notice of the finding promptly in the **Federal Register.**

Our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial scientific or commercial information was presented, we are required to promptly conduct a species status review, which we subsequently summarize in our 12-month finding.

Petition History

We received a Petition dated January 21, 2010, from Mollie Matteson, Center for Biological Diversity, requesting that the eastern small-footed bat and northern long-eared bat be listed as threatened or endangered and that critical habitat be designated under the Act. The Petition clearly identified itself as such and included the requisite identification information for the petitioner, as required by 50 CFR 424.14(a). In a February 19, 2010, letter to the petitioner, we acknowledged receipt of the Petition and stated that we would review the petitioned request for listing and inform the petitioner of our determination upon completion of our review. On June 23, 2010, we received a notice of intent to sue (NOI) from the petitioner for failing to make a timely 90-day finding. In a letter dated July 20, 2010, we responded to the NOI, stating that we had assigned lead for the two bat species to the Services' Midwest and Northeast Regions, and that although completing the 90-day finding within the 90-day receipt of Petition was not practicable, the Regions were recently allocated funding to work on the findings and had begun review of the Petition. This finding addresses the Petition to list the eastern small-footed bat and the northern long-eared bat.

Previous Federal Actions

On September 18, 1985 (50 FR 37958), November 21, 1991 (56 FR 58804), and November 15, 1994 (59 FR 58982), the Service issued Notices of Review identifying the eastern small-footed bat as a ''category-2 candidate'' for listing under the Act. However, on December 5, 1996 (50 FR 64481), the Service discontinued the practice of maintaining a list of species regarded as ''category-2 candidates,'' that is, taxa for which the Service has insufficient information to support issuance of a proposed listing rule. To date, no Federal actions have been taken with regard to the northern long-eared bat.

Species Information

Eastern Small-Footed Bat

The eastern small-footed bat (*Myotis leibii*), formerly known as Leib's bat, is a member of the order Chiroptera and family Vespertilionidae. It is one of the smallest North American bats, often weighing as little as 3 to 4 grams (g) (0.11 to 0.14 ounces (oz)) (Harvey and Redman 2003, p. 10). Total body length is between 73 and 85 millimeters (mm) (2.87 and 3.35 inches (in)), and wingspan is between 212 and 248 mm (8.35 and 9.76 in) (Barbour and Davis 1969, p. 103; Erdle and Hobson 2001, p. 6; Amelon and Burhans 2006, p. 57). Defining characteristics include very small feet, measuring less than 8 mm (0.31 in) in adults, and a black facial mask and black ears that contrast with the bat's light-tan-to-dark-brown back fur (Barbour and Davis 1969, p. 103; Erdle and Hobson 2001, p. 6).

The eastern small-footed bat occurs from eastern Canada and New England south to Alabama and Georgia, and west to Oklahoma (Barbour and Davis 1969, p. 103). The species' range includes: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, and West Virginia in the United States, and Ontario and Quebec in Canada. Eastern small-footed bats are considered rare because of their patchy distribution and generally low population numbers (Barbour and Davis 1969, p. 103). This species is most often detected during hibernation. About 125 hibernacula have been identified across the species' range, although most contain just a few individuals (Amelon and Burhans 2006, p. 61). Most documented occurrences of the species have been in New York, Pennsylvania, West Virginia, and Virginia (Amelon and Burhans 2006, p. 59). The eastern small-footed bat is State-listed as threatened in Pennsylvania because of an apparent population decline between the 1930s and the late 1970s (Felbaum *et al.* 1995, p. 24). From 1939 to 1944, more than 100 caves were surveyed in Pennsylvania and West Virginia, and out of these, eastern small-footed bats were observed at only 7 sites and totaled 363 individuals. In 1978 and 1979, the same seven caves were surveyed again and no eastern small-footed bats were observed (Felbaum *et al.* 1995, p. 24). Eastern small-footed bats are known to be susceptible to White-Nose Syndrome (WNS), and population declines (100 percent) were observed during surveys at Hailes Cave, New York, from 2005 to 2008, and these declines may be attributed to WNS (Hicks *et al.* 2008, p. 20).

Eastern small-footed bats overwinter in hibernacula that include caves and abandoned mines. In these hibernacula, they prefer locations close to the cave or mine entrance, where humidity is low and temperature fluctuations may be high relative to more interior areas (Barbour and Davis 1969, p. 104; Best and Jennings 1997, p. 3). Individuals often hibernate solitarily and have been found hibernating in rock crevices in cave or mine floors and beneath rocks within hibernacula (Barbour and Davis 1969, p. 104). Eastern small-footed bats have been observed hibernating in caves with big brown bats (*Eptesicus fuscus*), little brown bats (*Myotis lucifugus*), northern long-eared bats (*Myotis septentrionalis*), Indiana bats (*Myotis sodalis*), and tri-colored bats (*Perimyotis subflavus*). Male and female eastern small-footed bats inhabit the same hibernacula (Hitchcock 1965, pp. 6–8; Best and Jennings 1997, p. 3). Like most bat species, eastern small-footed bats exhibit high site fidelity to hibernacula, with individuals returning to the same site year after year (Gates *et al.* 1984, p. 166). Compared to other North American bat species, eastern small-footed bats are among the last to enter hibernacula and the first to emerge in the spring. Hibernation is approximately mid-November to March (Barbour and Davis 1969, p. 104).

In the summer months, eastern small-footed bats typically roost in talus (a slope of accumulated rock debris) areas associated with rocky ridge-tops, but they have also been found roosting on buildings and bridges and behind loose bark on trees (Barbour and Davis 1969, p. 103; MacGregor and Kiser 1998, p. 175; Amelon and Burhans 2006, p. 58; Chenger 2008, p. 10; Johnson *et al.* 2008, p. 29; Johnson and Gates 2008, p. 456). Roost sites may be at ground level in talus slopes, or in rock outcrops within shale barrens (Johnson *et al.* 2008, p. 29; Johnson and Gates 2008, p. 456). Both males and females change roost sites often, even daily; however, the reason for this frequent relocation is not known (Johnson *et al.* 2008, p. 29). Available data regarding the eastern small-footed bat suggest that females of this species form small colonies, with males roosting singly or in small groups (Erdle and Hobson 2001, p. 10). Eastern small-footed bats are known to migrate regionally. Three female eastern small-footed bats migrated 0.1 to 1.1 kilometer (km) (0.06 to 0.68 miles (mi)) from their winter hibernacula to rock outcrops within shale barren habitat (Johnson and Gates 2008, p. 456). The distance traveled is probably influenced by the availability of hibernacula and roosting sites across the landscape (Johnson and Gates 2008, p. 457).

Eastern small-footed bats are nocturnal foragers and primarily forage over streams, ponds, or other water bodies where concentrations of nocturnal insects are high (MacGregor and Kiser 1998, p. 175). Chenger (2008, pp. 10, 69–71) observed a female eastern small-footed bat foraging on three consecutive nights in June in a relatively small logged area on a hilltop, approximately 3.2 km (1.99 mi) from her talus-field diurnal (daytime) roost. He observed a second female eastern small-footed bat foraging in a predominantly forested area within 0.8 km (0.50 mi) of her talus-field diurnal roost. Eastern small-footed bats are dietary generalists and feed primarily on soft-bodied prey by hawking (capturing prey while in flight) and gleaning (capture of prey on any kind of substrate, or surface) (Moosman *et al.* 2007, p. 355 and p. 358).

Eastern small-footed bats are thought to be similar to sympatric *Myotis* that breed in the fall; spermatozoa are stored in the uterus of hibernating females until spring ovulation, and a single pup is born in May or June (Barbour and Davis 1969, p. 104; Amelon and Burhans 2006, p. 58). Adult longevity is estimated to be up to 12 years in the wild (Hitchcock 1965, p. 11). Mean annual survival rates are significantly lower for females than for males, 42.1 and 75.7 percent, respectively (Hitchcock *et al.,* 1984, p. 128). The lower rate of survival of females may be a result of a combination of factors: The greater demands of reproduction on females; the higher metabolic rates and longer sustained activity during the day in summer (*i.e.,* less time spent in daytime lethargy); and the greater exposure to possible disease-carrying parasites in maternity colonies (Hitchcock *et al.* 1984, p. 127). Low survivorship and an evolutionary inability to compensate with a larger litter size may explain why eastern small-footed bats are generally uncommon (Hitchcock *et al.* 1984, p. 129).

Northern Long-Eared Bat

The northern long-eared bat (*Myotis septentrionalis*) is a member of the order Chiroptera and family Vespertilionidae. The northern long-eared bat was considered a subspecies of Keen's long-eared Myotis (*Myotis keenii),* but was recognized as a distinct species by van Zyll de Jong in 1979 (1979, p. 993, as cited in Caceres and Pybus 1997, p. 1); Nagorsen and Brigham (1993, p. 87); Whitaker and Mumford (2009, p. 207); and Simmons (2005, p. 516). No subspecies have been described for this species (Nagorsen and Brigham 1993, p. 90; Whitaker and Mumford 2009, p. 214). Thus, we accept the characterization of the northern long-eared bat as a distinct species of *Myotis.*

The northern long-eared bat is a medium-sized bat species with an average adult body weight of 5 to 8 g (0.18 to 0.28 oz) and average body length of 77 to 95 mm (3.03 to 3.74 in) (Caceres and Barclay 2000, p. 1). The northern long-eared bat is a relatively long-lived species, with ages up to 19 years recorded in the wild (Caceres and Pybus 1997, p. 4). It has medium to dark brown fur on its back, dark brown ears and wing membranes, and tawny-to-pale-brown fur on the ventral side (Nagorsen and Brigham 1993, p. 87; Whitaker and Mumford 2009, p. 207). This species is distinguished from other *Myotis* species by its large ears (average 17 mm (0.67 in), Whitaker and Mumford 2009, p. 207) that, when laid forward, extend (less than 5 mm (0.20 in)) beyond the muzzle (Caceres and Barclay 2000, p. 1). The tragus (a thin, cartilaginous structure attached to the base of the ear) is long and pointed (average 9 mm (0.35 in), Whitaker and Mumford 2009, p. 207), and often curved (Nagorsen and Brigham 1993, p. 87; Whitaker and Mumford 2009, p. 207). Females tend to be slightly larger and heavier than males (Caceres and Pybus 1997, p. 3).

The northern long-eared bat ranges across much of the eastern and north central United States, and all Canadian provinces west to the southern Northwest Territories and eastern British Columbia (Nagorsen and Brigham 1993, p. 89; Caceres and Pybus 1997, p. 1). However, in all these places, the species is patchily distributed and rarely found in large numbers (Barbour and Davis 1969, p. 77). The species' range includes: Alabama, Arkansas, Connecticut, Delaware, the District of Columbia, Florida, 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, and Wisconsin (Center for Biological Diversity Petition (Petition, p. 6)). The petitioner notes that a small number of sightings have also been reported in Wyoming (Petition, p. 6). The species is considered rare in the northwestern part of its range (Nagorsen and Brigham 1993, p. 90; Caceres and Pybus 1997, p. 2) and in some southern States (Crnkovic 2003, p. 715).

Although summer roost habitat is defined variably across the species' range, its presence is generally correlated with old-growth forests composed of trees 100 years old or older (Caceres and Pybus 1997, p. 2; Petition, p. 7). The species is reliant on intact interior forest habitat, with low edge-to-interior ratios (Yates and Muzika 2006, p. 1245). Relevant late-successional forest features include a high percentage of old trees, uneven forest structure (resulting in multilayered vertical structure), single and multiple tree-fall gaps, standing snags, and woody debris (Krusic *et al.* 1996, p. 631; Leverett 2001, pp. 59–65). These late-successional forest characteristics may be favored for several reasons, including the large number of partially dead or decaying trees that the species uses for breeding, summer day roosting, and foraging (Krusic *et al.* 1996, p. 631; Caceres and Pybus 1997, p. 2; Waldien *et al.* 2000, pp. 793–794). Males typically roost singly and prefer coniferous trees in conifer-dominated stands, while females roost singly or in small groups, preferring shade-tolerant deciduous trees of mid-stage decay in mature stands (Broders and Forbes 2004, p. 606). Females may form small maternity colonies behind exfoliating bark, in tree snags, and in stumps, as well as in bat houses and behind building shutters (Waldien *et al.* 2000, pp. 793–794; Whitaker and Mumford 2009, p. 209). Females exhibit a high philopatry (tendency to return) to their natal sites (Arnold 2007, p. 375).

While the northern long-eared bat is not a migratory species, movements of the species between summer roost and winter hibernacula covering up to 56 km (34.8 mi) have been documented (Nagorsen and Brigham, 1993 p. 88). Northern long-eared bats may hibernate solitarily or in multispecies hibernacula, and are commonly found in caves or inactive mines, although they generally constitute less than 25 percent of the total number of individuals present in multispecies hibernacula (Barbour and Davis 1969, p. 77; Caceres and Pybus 1997, p. 1). The species appears to favor small cracks or crevices in cave ceilings, preferring cooler, higher humidity areas for hibernation than do many other *Myotis* species (Barbour and Davis 1969, p. 77; Whitaker and Mumford 2009, pp. 209–210). Hibernation during the winter months conserves energy by precluding the need for maintaining high body temperature when food is unavailable. To increase energy savings, individuals enter a state of torpor (a state of slowed body function used to conserve energy), where internal body temperature approaches ambient temperature, metabolic rates are significantly lowered, and all unnecessary movement is avoided (Thomas *et al.* 1990, p. 475; Thomas and Geiser 1997, p. 585; Caceres and Pybus 1997, p. 9). However, intercave movements are not uncommon: During winter periods, this species is known to break torpor briefly and fly outside the hibernacula on warm winter nights (Whitaker and Mumford 2009, pp. 208–211).

The northern long-eared bat is an opportunistic insectivore, using both hawking and gleaning to forage on a variety of small insects, including moths, flies, leafhoppers, and beetles (Nagorsen and Brigham 1993, p. 88). The species prefers forested hillsides and ridges, foraging at dusk over small ponds and forest clearings under the forest canopy (Nagorsen and Brigham 1993, p. 88) or along streams (Whitaker and Mumford 2009, p. 209). A study by Caceres and Pybus (1997, p. 2) suggests that mature forest stands play an important role in foraging behavior of northern long-eared bats.

The northern long-eared bat exhibits a delayed fertilization strategy, with mating taking place in late summer or early fall (Caceres and Pybus 1997, p. 4). The sperm is stored until the female emerges from hibernation in the spring, when ovulation and fertilization takes place. However, some individuals mate again in the spring (Racey 1979, p. 392 (in Racey 1982, p. 65); Racey 1982, pp. 72–73; Petition, p. 9). Females typically bear one offspring annually (Caceres and Pybus 1997, p. 4; Caceres and Barclay 2000, p. 2).

Evaluation of Information for This Finding

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations at 50 CFR 424 set forth the procedures for adding a species to, reclassifying a species from endangered to threatened or from threatened to endangered on, or removing a species from, the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

In considering what factors might constitute threats, we must look beyond the exposure of the species to a factor to evaluate whether the species may respond to the factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat, and during the subsequent status review, we attempt to determine how significant a threat it is. The threat is significant if it contributes to the risk of extinction of the species such that the species may warrant listing as threatened or endangered as those terms are defined in the Act. However, the identification of factors that could impact a species negatively may not be sufficient to compel a finding that the information in the Petition and our files is substantial. The information must include evidence sufficient to indicate that these factors may act on the species to the point that the species may meet the definition of threatened or endangered under the Act.

In making this 90-day finding, we evaluated whether information presented in the Petition and located in our files regarding threats to the eastern small-footed bat and northern long-eared bat is substantial, thereby indicating that the petitioned action may be warranted. Our evaluation of this information is presented below.

A. The Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

The petitioner states that threats causing the present or threatened destruction, modification, or curtailment of eastern small-footed bat and northern long-eared bat habitat or range include agricultural and residential development; logging; oil, gas, and mineral development; wind energy development; and mine closures.

Agricultural and Residential Development

Information Provided in the Petition

The petitioner asserts that habitat loss, degradation, and fragmentation resulting from expansion of residential and agricultural development is a threat to eastern small-footed bat and northern long-eared bat populations, because habitat loss, degradation, and fragmentation increase the risks of reproductive decline, genetic isolation, changes in demography, and eventual changes in distribution, abundance, community diversity, and population viability (Petition, p. 14). Some of the highest rates of residential development in the conterminous United States are occurring in the ranges of eastern small-footed bat and northern long-eared bat (Brown *et al.* 2005, p. 1856). As residential development increases, habitat fragmentation and other anthropogenic elements increase, causing landscape-level effects (Smith and Wachob 2006, p. 437). As habitat patches are fragmented, the proportion of edge habitat (zone where adjacent habitat types meet) increases, which has been correlated with reduced occupancy of northern long-eared bats in forested habitat (Yates and Muzika 2006, p. 1243). The petitioner states that reduced connectivity between roosting and foraging habitats may increase the bats' energy expenditures and contribute to local population declines (Petition, p. 14). The petitioner states that industrial agriculture (characterized by large-scale monocropping and the use of abundant pesticides, fertilizers, and irrigation) can pollute soils and water and eradicate local insect populations, effectively excluding bats from their former habitats (Petition, p. 14).

Evaluation of Information Provided in the Petition and Available in Service Files

In general, we would expect that the loss, degradation, and fragmentation of eastern small-footed bat and northern long-eared bat habitat, particularly habitat in maternity, foraging, roosting, and hibernacula areas, would constitute a threat to local populations; however, we do not have any information in our files indicating loss of these habitats from residential or agricultural development. We find the information provided in the Petition does not present substantial scientific or commercial information that residential and agricultural development may be threats to the northern long-eared bat or the eastern small-footed bat. However, we will further investigate these activities for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Logging

The petitioner asserts that the loss of forested habitat by logging threatens the eastern small-footed bat and northern long-eared bat (Petition, pp. 14–16). Logging affects bat populations through direct loss of roosting and foraging habitats and changes in forest structure and insect distribution and abundance (Hayes and Loeb 2007, pp. 207–235). The petitioner asserts that the most commonly employed silvicultural practices are incompatible with bat habitat conservation (Petition, p. 14). The petitioner states that there is evidence that northern long-eared bats prefer older forest stands because of their affinity for large-diameter trees and high snag density. In industrial forests under typical management practices, large-diameter snags may be absent (Wilhere 2003, p. 530). Older forests contain partially dead, decaying, and hollow trees and cavities that northern long-eared bats rely on for breeding habitat (Petition, p. 7). Large-scale commercial forestry within the ranges of the eastern small-footed bat and the northern long-eared bat is found primarily in New England's northern forest and in portions of the southeastern United States (Petition, p. 15). According to the petitioner, clearcutting is standard forestry practice in southeastern forests, and older forest stands are rare (Petition, p. 15; Trani 2002, p. 20).

Evaluation of Information Provided in the Petition and Available in Service Files

Mature forest stands provide important roosting and foraging habitat for northern long-eared bats (Caceres and Pybus 1997, p. 2). The felling of individual trees can cause direct mortality when roosting bats or maternity colonies are present. Because mature forests are often structurally diverse (*e.g.,* exfoliating bark, high snag density), they provide more roosting opportunities for forest-dwelling bats than do younger forests. Even-age timber management practices (*e.g.,* clearcutting, shelterwood harvests) lead to the loss, degradation, and fragmentation of mature forest habitat and, therefore, may have the potential to adversely affect the northern long-eared bat. It is unclear whether logging is a threat to the eastern small-footed bat, since they are most often observed roosting in talus habitats; Chenger (2008, pp. 10, 69–71) found an eastern small-footed bat foraging in a small logged area. In summary, we find the information provided in the Petition and other information in our files present substantial scientific or commercial information indicating that logging may be a threat to the northern long-eared bat. We will further investigate this potential threat for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Oil, Gas, and Mineral Development

The petitioner states that oil, gas, and mineral development, although localized, may pose a substantial threat to some bat populations, particularly in New York, Pennsylvania, Virginia, West Virginia, and Tennessee, where oil and gas reserves are greatest (Petition, p. 16). Eastern small-footed bats' reliance on loose shale, talus, or karst formations often found in oil-, gas-, and mineral-rich lands makes them especially vulnerable to habitat loss associated with natural resource exploitation (Amelon and Berhans 2006, p. 60). Natural gas extraction, particularly across the Marcellus Shale region, which includes large portions of New York, Pennsylvania, Ohio, and West Virginia, is expected to expand over the coming years. According to the petitioner, onsite impacts from natural gas drilling include clearing of forest or other habitat for the drill pad, road construction for access to the site, construction of containment ponds to hold waste (combination of water and proprietary chemicals) generated in the hydrofracking process (hydraulic fracturing of rock caused by drilling), and drilling and transport infrastructure for the extracted gas (Petition, pp. 16–17). Lastly, the petitioner discusses the effects of mountaintop removal, valley filling, and contaminant discharge associated with coal extraction (Petition, pp. 17–18). More than 12 million acres in Kentucky, West Virginia, Virginia, and Tennessee are currently affected and, within this area, nearly 6.8 percent of forested habitat has been lost to mountaintop removal and valley fills (Petition, p. 18).

Evaluation of Information Provided in the Petition and Available in Service Files

Large concentrations of gas wells and coal mines, and virtually the entire Marcellus Shale formation, fall within the eastern small-footed bat and northern long-eared bat ranges. The information provided by the petitioner supports the petitioner's claim that oil, gas, and mineral development may result in the loss or modification of eastern small-footed bat and northern long-eared bat habitat. In particular, activities that impact talus areas or mature forested habitats are potential threats to the eastern small-footed bat and northern long-eared bat, respectively. We find the information provided in the Petition presents substantial scientific or commercial information indicating that oil, gas, and mineral development may be a threat to the northern long-eared and eastern small-footed bats. We will further investigate these threats to habitat for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Wind Energy Development

The petitioner states wind energy development may be a threat to the two species through loss of habitat and direct mortality from turbine operation (Petition, pp. 18–19). Bats are killed in significant numbers by utility-scale (greater than or equal to (≥) 0.33 megawatt (a unit of power equal to 1 million watts (MW)) wind turbines, with the greatest number of fatalities occurring along forested ridgetops in the eastern United States (Johnson 2005, p. 46; Arnett *et al.* 2008, p. 63). Northern long-eared bat fatalities have been reported at several wind energy facilities, but generally constitute a small fraction of total mortality (Kerns and Kerlinger 2004, p. 15; Johnson 2005, p. 45). The petitioner asserts, however, that low numbers of the northern long-eared bat are consistent with its relative representation in regional bat communities and should not be taken as an indication that this species is not susceptible to wind energy-related mortality (Petition, p. 19). There are no reports of eastern small-footed bat fatalities at wind energy facilities; however, mist-net surveys conducted in Pennsylvania revealed that this species was present within wind facility project areas (Capouillez and Mumma 2008, p. 19). Lastly, the petitioner states that because the eastern small-footed bat is associated with rocky ridgetop habitat, the species may be vulnerable to habitat loss caused by wind development in those areas (Petition, p. 19).

Evaluation of Information Provided in the Petition and Available in Service Files

Wind power development may constitute a threat to the eastern small-footed bat and northern long-eared bat. Eastern small-footed bats typically roost in talus areas which occur on ridgetops. In the Appalachian Mountains, these areas coincide with past, present, and anticipated future wind power development, exposing the species to both habitat loss due to project construction and the risk of mortality due to turbine operation. Although no mortality of eastern small-footed bats has been reported to date, mortality of northern long-eared bats has been reported (Kerns and Kerlinger 2004, p. 15; Johnson 2005, p. 45). Forest clearing associated with turbine and road construction might also threaten the northern long-eared bat, particularly if it occurs in mature forest habitat. We find that the information provided in the Petition and other information in our files present substantial scientific or commercial information indicating the petitioned action may be warranted due to wind power development. We will further investigate this threat to habitat for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Mine Closures

The petitioner states abandoned mines serve as important habitat for many bat species and that although mine closures may be advisable for public safety, certain methods of closure can also exclude bats (Petition, p. 19). In a few reported instances, mines were closed when bats were hibernating and entire colonies were entombed (Tuttle and Taylor 1998, p. 8). Bat-compatible closures have been installed on Federal lands, but according to the petitioner, mines on non-Federal lands are still often closed improperly, and in some areas this may represent significant habitat loss to bats (Petition, p. 19).

Evaluation of Information Provided in the Petition and Available in Service Files

Mine closures have the potential to cause direct mortality to eastern small-footed and northern long-eared bats if they occur while bats are hibernating. Secondarily, because eastern small-footed bats and northern long-eared bats exhibit high site fidelity, mine closures conducted during non-hibernating periods would cause them to expend more energy finding new hibernacula during a time when stored fat reserves are critical to their winter survival. Lastly, modifications to mines and/or surrounding areas could change the airflow and alter microclimates, possibly eliminating their utility as hibernacula. In general, threats to the integrity of hibernacula have decreased at sites harboring the Indiana bat since it was first listed as endangered (Service 2007, p. 74); however, it is unclear whether mines containing unlisted bat species are afforded adequate protections. We do not have information in our files documenting that mines supporting hibernating populations of eastern small-footed bats or northern long-eared bats are being closed. We find that the information provided in the Petition and other information in our files does not present substantial scientific or commercial information indicating the petitioned action may be warranted due to mine closures. However, we will further investigate the threat to habitat for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Summary of Factor A

In summary, we find the information provided in the Petition and other information in our files presents substantial scientific or commercial information indicating that the continued existence of these two species may be threatened by habitat destruction, modification, or curtailment caused by logging (northern long-eared bat); oil, gas, and mineral development (eastern small-footed and northern long-eared bats); and wind energy development (eastern small-footed and northern long-eared bats). The information provided for agricultural and residential development and mine closures was not substantial. We will further investigate the threats to habitat for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The petitioner did not present information, nor do we have information in our files, suggesting that overutilization is affecting eastern small-footed bat or northern long-eared bat populations. However, we will further investigate whether overutilization for commercial, recreational, scientific, or educational purposes is a threat to the eastern small-footed bat and northern long-eared bats in our 12-month status reviews.

C. Disease or Predation

Information Provided in the Petition

The petitioner provides information indicating that the fungal disease known as White-Nose Syndrome (WNS) has become a deleterious pathogen responsible for unprecedented mortality in hibernating bats in the northeastern United States, including the northern long-eared and eastern small-footed species. Over the past 3 years, WNS has caused local declines approaching 100 percent in some populations, with an estimated loss exceeding 1 million bats (Gargas *et al.* 2009, p. 148; Kunz 2009, p. 2; Reichard and Kunz 2009, p. 457 [note that the petitioner cited this reference as Reichard *et al., in press* (Petition, p. 22), but we assume Reichard and Kunz (2009) is the referenced document]; Petition pp. 19–23). The pathogen has rapidly spread throughout the northeastern United States since its discovery in the winter of 2006–2007, affecting six species of insect-eating bats, including the northern long-eared and eastern small-footed (Blehert *et al.* 2009, p. 227; Reichard and Kunz 2009, p. 457). Since its initial discovery at 5 sites in eastern New York State in 2007 (Gargas *et al.* 2009, p. 147; Petition, p. 19), WNS has been documented in more than 60 hibernacula, as far as 805 km (500 mi) from the initial infection zone (Szymanski *et al.* 2009, p. 7). By the end of winter 2008–2009, WNS had spread to 37 counties in the States of Massachusetts, New Jersey, New York, Vermont, West Virginia, New Hampshire, Connecticut, Virginia, and Pennsylvania (Gargas *et al.* 2009, p. 147; Reichard and Kunz 2009, p. 457). WNS is linked to high mortality of several hibernating bat species (e.g., 81 to 97 percent mortality in hibernacula (Darling 2009, p. 3), up to 100 percent mortality in some populations (Kunz 2009, p. 1)), including the northern long-eared and eastern small-footed (Blehert *et al.* 2009, p. 227).

White-nose syndrome is associated with a previously unknown species of cold-loving fungus, *Geomyces destructans* (*G.d.*), which produces a skin infection among affected bats (Gargas *et al.* 2009, p. 152). The syndrome is characterized by the presence of profuse white fungal hyphae (thread-like filaments forming the vegetative part of a fungus) and conidia (non-motile spores) on the muzzle, ears, or wing membranes of hibernating bats (Gargas *et al.* 2009, pp. 148). *Geomyces destructans* penetrates the dermis (skin), eroding wing and ear tissue, and may extend hyphae into hair follicles and sebaceous glands (small glands in the skin that secrete an oily substance called sebum into hair follicles), yet the fungus does not typically lead to inflammation or immune response in the tissue (Blehert *et al.* 2009, p. 227; Gargas *et al.* 2009, p. 148; Petition, p. 20). This fungus grows optimally in low temperatures (5 to 14 °C (40 to 55 °F)) and high levels of humidity, conditions characteristic of winter bat hibernacula and ambient temperature of hibernating bats, thus potentially permitting year-round maintenance of this fungal species (Blehert *et al.* 2009, p. 227; Gargas *et al.* 2009, p. 153; U.S. Geological Survey (USGS) 2009, p. 2). This disease appears contagious. The fungus is transmitted from the environment to individual bats, from bat to bat when they are in close contact, as during hibernation, and likely from unintentional contamination from intercave movements by cavers or researchers (USGS 2009, p. 2). The pathogen's apparent expansion rate and the current radius of WNS infection are generally consistent with the annual range (distance between summer and winter habitat) of individual bats from known WNS-affected hibernacula, suggesting that the dispersal of infected bats is likely the primary vector for the continued spread of this disease (Hicks *et al.* 2008, p. 18; Reichard and Kunz 2009, p. 463).

It is not known with certainty if the fungal infection is the direct cause of mortality or the secondary effect of some undetected malady; however, infected bats have been observed exhibiting aberrant behaviors, including shifts of large numbers of bats in hibernacula to roosts near the entrances or unusually cold areas; large numbers of bats dispersing during the day from hibernacula, even during mid-winter; a general lack of responsiveness to human disturbance; and, on occasion, large numbers of fatalities, either inside the hibernacula, near the entrance, or in the immediate vicinity of the entrance (Boyles and Willis 2009, p. 93; Darling 2009, p. 2; Kunz 2009, pp. 3–4). Several factors may be responsible for the mortality associated with WNS, which is currently under investigation. First, WNS-affected bats exhibit wing damage with varying degrees of scarring, necrosis (death of cells or tissues through injury or disease, especially in a localized area of the body), and atrophy (wasting or decrease in size of a body organ, tissue, or part owing to disease, injury, or lack of use) of flight membranes, which may lead to reduced foraging success, leaving affected bats in poor condition as they prepare for hibernation in years after infection (Boyles and Willis 2009, p. 92; Reichard and Kunz 2009, p. 458). Bats with severe wing damage have been found to have significantly lower body mass than those with little or no WNS-induced wing damage, and this may also contribute to reproductive decline or failure (Petition, p. 22). Though some reports indicate that mild scarring or tissue necrosis of wing membranes caused by normal foraging injuries may heal in less than 4 weeks, bacterial or fungal infection may delay this process (Reichard and Kunz 2009, pp. 462–463). A study by Reichard and Kunz (2009, p. 463) found that greater than 80 percent of little brown bats (*M. lucifugus*) affected by WNS and initially exhibiting light wing damage (see Reichard and Kunz 2009, p. 460, for wing damage ranking prioritization) had failed to improve after recapture. Since wing damage compromises flight maneuverability and foraging success, the reduced abundance of bats with moderate-to-severe wing damage as summer progressed may be due to death from starvation or increased predation risk (Reichard and Kunz 2009, p. 463). Although not specific to the northern long-eared or eastern small-footed bats, Darling (2009, pp. 2–3) noted that WNS-affected bats captured in May and June in Vermont showed substantial wing damage, which eventually leads to increased summer mortality.

Second, hibernating WNS-affected individuals may arouse from a state of torpor more frequently or for longer periods than normal, which prematurely expends stored fat reserves on which they rely for winter survival (Kunz 2009, p. 4; USGS 2009, p. 1). Healthy bats typically arouse from torpor every 13 to 15 days, but WNS-affected individuals have been observed to awake every 2 to 4 days (Youngbaer 2009, p. 3). Bats naturally arouse from torpor several times during hibernation to seek water, eliminate waste, and, if environmental conditions become unsuitable or if bats are physically disturbed, to make intracave and intercave movements (up to 200 km (124.3 mi)) (Caceres and Pybus 1997, p. 9; Whitaker and Mumford 2009, p. 211). However, arousal from torpor is energetically expensive, and chronic disturbance of hibernating bats is known to cause high rates of winter mortality through accelerated fat loss and starvation. Arousal from a state of torpor significantly increases the demand on limited energy stores as bats increase body temperature and metabolic rates (Caceres and Pybus 1997, p. 9). Further, bats typically do not have foraging opportunities to replace expended energy during winter months (Caceres and Pybus 1997, p. 9). For example, Thomas *et al.* (1990, p. 945) found little brown bats use an average of 108 milligrams (0.004 oz) of fat stores each time they arouse from torpor, which is energetically equivalent to 68 days of torpor. Arousals generally account for 80 to 90 percent of the energy expenditure in hibernating animals during the winter (Caceres and Pybus 1997, p. 9); thus, increased arousal frequency contributes to premature energy store depletion. The petitioner postulates that WNS-affected individuals are irritated by the fungal infection, which causes bats to break torpor more frequently to groom, or in hope of feeding (Petition, p. 22).

Lastly, WNS-affected individuals sampled in hibernacula have been found lacking chitinase (Petition, p. 21), an essential enzyme that remains active throughout the winter and allows for the breakdown of chitin, a primary component of insect exoskeletons (Whitaker *et al.* 2004, p. 17). During the winter months, chitin remaining in the bats' digestive tracts from the previous summer's foraging may provide supplementary energy and nutrients crucial to overwintering bats (Whitaker *et al.* 2004, p. 17; Whitaker and Mumford 2009, p. 210); therefore, the absence of chitinase in WNS-affected bats may contribute to the observed winter starvation (Petition, p. 21). These observations are of interest to the WNS research community, but the hypothesized connection to mortality is largely unsubstantiated.

At some sites, WNS-affected bats had poorer body condition (e.g., lower body-mass index (BMI) and less stored fat) in summer and winter, and were generally smaller throughout the reproductive period in 2008, when compared to data collected in 1975 (Kunz *et al.* 2008 as cited in the Petition, p. 21). This raises concerns that bats with WNS that survive the hibernation period will exhibit lower reproductive rates (Reichard and Kunz 2009, p. 458). If their flight abilities are compromised during the active season due to wing damage from the fungal infection, individuals are less likely to achieve sufficient energy and nutrient intake to sustain gestation and lactation (Reichard and Kunz 2009, p. 461). For instance, approximately 85 percent of female adult little brown bats in WNS-affected colonies were observed to be reproductively active in 2008, whereas past research has indicated that, in normal years, over 93 percent of females were reproductively active (Reichard and Kunz 2009, p. 462). The petitioner also notes major additional bat declines (more than 90 percent) observed at summer maternity colonies that were stable or growing before WNS, and pup mortality in the 2009 reproductive season was unusually high (Reynolds, pers. comm. as cited in the Petition, p. 23); however, the Petition did not specify which bat species or which locations exhibited a decline.

Although immune function is somewhat suppressed in all hibernating bats, there is evidence that WNS-affected bats have further reduced immune competence during hibernation (Kunz 2009, p. 4; Petition, pp. 21–22). In one study, WNS-affected individuals' innate immunity (basic resistance to disease, which is less energetically costly) seems to be unchanged or even slightly increased, whereas their adaptive immunity (more complex antigen-specific response, which is more energetically costly) was found to be significantly suppressed (Jacob and Reeder, unpublished data as cited in the Petition, p. 21); however, it is unclear whether the results of this study are typical. The Petitioner infers that this may suggest a reduced immune competence, although the immunological mechanisms behind these differences are not yet known (Petition, p. 21).

Evaluation of Information Provided in the Petition and Available in Service Files

We reviewed cited and referenced publications that were readily available in our files, and in general we find substantive information indicating that assertions made by the petitioner are accurate. In particular, Reichard and Kunz (2009), Blehert *et al.* (2009), and Gargas *et al.* (2009) identified substantial threats from WNS to multiple bat species, including the northern long-eared and eastern small-footed bats. Some commonly observed symptoms associated with WNS-affected bats include visible fungus on flight membranes, excessive or unexplained numbers of dead or dying bats at or near the hibernaculum, moderate-to-severe damage to wing membranes, and abnormal behavior (*e.g.,* population shift to entrance of the hibernaculum, decreased arousal with disturbance inside hibernaculum). A study by Reichard and Kunz (2009, p. 462) reveals an unexpectedly high prevalence of wing damage on little brown bats (*Myotis lucifugus*) within the range of WNS, although the authors note wing damage, low body mass, and decreased reproductive success may result from many possible factors, including WNS. Ultimately, these conditions may compromise flight ability and recruitment, and increase risk of starvation from repeated arousal from a state of torpor during hibernation and other life history events. Further, declines in reproduction by northern long-eared or eastern small-footed bats is a source of concern because of their low reproductive rate (one offspring annually (Hitchcock *et al.* 1984, p. 128; Caceres and Pybus 1997, p. 4; Caceres and Barclay 2000, p. 2)), which makes recovery from potential population declines difficult.

Although the information cited in the Petition includes adverse impacts of WNS on other more abundant hibernating bat species, because the northern long-eared and eastern small-footed species have been documented as susceptible to WNS, it is reasonable for us to conclude similar effects to the petitioned species (Hicks *et al.* 2008, p. 21; Blehert *et al.* 2009, p. 227; Gargas *et al.* 2009, p. 148; Reichard and Kunz 2009, p. 457; Youngbaer 2009, p. 3). WNS has caused large-scale declines in many affected bat populations, including the northern long-eared and eastern small-footed species, with total estimated losses exceeding 1 million bats (Gargas *et al.* 2009, p. 148; Kunz 2009, p. 2). In New York State, WNS mortality rates from 2007 (first year monitored) ranged from 57 to 64 percent; in 2008, mortality rates rose to between 81 and 100 percent (Hicks *et al.* 2008, p. 19). Vermont has documented population declines of 95 percent at WNS-affected hibernacula (Darling 2009, p. 4). Mortality of northern long-eared and eastern small-footed bats linked to WNS has occurred across portions of their ranges (Gargas *et al.* 2009, p. 148). The confirmation of WNS across large portions of the eastern small-footed bat's range and eastern sections of the northern long-eared bat's range (Szymanski *et al.* 2009, p. 47), along with the historical and anticipated future rate of WNS spread, indicate that WNS may have the potential to negatively impact large portions of the petitioned species' ranges in the near future.

The Service is leading a cooperative effort with Federal and State agencies, Tribes, researchers, universities and other nongovernment organizations to research and manage the spread of WNS. The Service issued an advisory calling for a voluntary moratorium on all caving activity in States known to have hibernacula affected by WNS, as well as caving activity in all adjoining States, unless conducted as part of an agency-sanctioned research or monitoring project (Service 2009b). This advisory is not a regulatory mechanism. Several States, including Missouri, Iowa, and Illinois, have now closed all State-owned hibernacula to human entry, but entry to hibernacula on private lands remains at the landowners' discretion.

We find the Petition and other information in our files present substantial information indicating that WNS may be a threat to the northern long-eared bat and the eastern small-footed bat. We will further investigate this threat to both the northern long-eared and eastern small-footed bats, as well as ongoing conservation efforts to manage the threat, in our 12-month status reviews.

D. The Inadequacy of Existing Regulatory Mechanisms

According to the petitioner, existing regulatory mechanisms do not adequately protect eastern small-footed bats or northern long-eared bats from the variety of threats discussed in the petition (Petition, pp. 28–38). The petitioner discusses inadequate regulations governing private, State, and Federal lands, and inadequate oversight by State and Federal agencies for impacts related to development, forestry, wind energy development, and oil, gas, and mineral extraction. Lastly, the petitioner asserts that the management of WNS by State and Federal agencies is inadequate.

Information Provided in the Petition

Private lands constitute approximately 90 percent of the total land area within the ranges of the eastern small-footed bat and northern long-eared bat, and regulation of activities on these lands that degrade or destroy habitat is minimal (Petition, p. 29). In addition, a substantial number of bat hibernacula occur on private lands, and although the Federal Cave Resources Protection Act of 1988 affords protection to caves on federally owned lands, it does not protect caves on private lands (Petition, p. 32).

The petitioner states that State-owned lands constitute approximately 5 percent of the total land area within the ranges of the eastern small-footed bat and northern long-eared bat (Petition, p. 33). The petitioner states that the eastern small-footed bat is State-listed as endangered in New Hampshire, threatened in Vermont and Pennsylvania, and is a species of special concern in Connecticut, Massachusetts, Maryland, Missouri, North Carolina, New Jersey, New York, Ohio, Oklahoma, Tennessee, Virginia, West Virginia, and Georgia. The petitioner states that the northern long-eared bat is a candidate for State-listing in Pennsylvania and is a species of special concern in Missouri and Montana. The petitioner asserts, however, that protections afforded by State-listing are narrow. Most State endangered species laws protect against trade or possession of any State-listed species but make no provisions against habitat destruction (Petition, p. 33).

According to the petitioner, threats with inadequate regulatory mechanisms on State lands include oil, gas, and mineral extraction; timber management; and wind energy development (Petition, pp. 33–35). Lastly, the petitioner asserts that although most States have laws protecting caves and cave-dwelling species, enforcement of regulations is variable (Petition, p. 35).

Between 4 and 6 percent of the total land area within the ranges of the eastern small-footed bat and northern long-eared bat are federally owned, and most of these lands are National Forest lands managed by the U.S. Forest Service. Land and Resource Management Plans written for each National Forest contain provisions to protect federally listed bat species (*e.g.,* buffer zones around hibernacula and maternity sites, restricted access to caves, snag retention); however, generally no provisions are included for the protection of non-federally listed species (Petition, pp. 29–30). A species designated as sensitive, however, is entitled to impact analysis on proposed actions pursuant to the National Environmental Policy Act, although if adverse effects are expected, there is no requirement for the selection of a benign alternative action, monitoring, or mitigation for that species (Petition, p. 31).

The petitioner asserts that regulations governing oil, gas, and mineral extraction on Federal lands are wholly inadequate for the protection of eastern small-footed bats and northern long-eared bats, particularly in split-estate situations (Petition, pp. 31–32). In split-estate situations, the rights to minerals occurring beneath Federal lands are privately owned. In these cases, bat populations presumably protected by the domain of Federal agencies and environmental regulations may be threatened by drilling or mining activities on privately held subsurface estates (Petition, p. 31). The petitioner also asserts that economic considerations consistently take precedence over species protections, and cites the Service as having said that in nearly all cases where there has been a conflict between endangered species and a mining project, the project has been permitted with only minor modifications (Service 1997, p. 1651). Lastly, the petitioner states that there is little oversight by the Office of Surface Mining on post-mining reclamation once a permit has been issued, even though wildlife habitat is cited as the predominant post-mining land use (Petition, p. 32).

The petitioner states that Federal oversight of wind energy development is limited. While the Service may recommend pre- and post-construction surveys, developers are not required to engage in any pre-construction surveying, monitoring, or mitigation unless a federally listed endangered species is present (Petition, pp. 32–33).

The petitioner asserts that regulatory mechanisms are inadequate for the management of WNS. On September 8, 2009, a draft framework for a plan to assist States, Federal agencies, and Tribes in managing WNS in bats was prepared. The framework provides an overview of the expected plan content that will guide future activities responding to WNS (Service 2009a). The petitioner takes several issues with the plan, including concerns over the lack of funding for implementing the plan, but most important, asserts that the plan will not provide adequate legal authority for the protection of non-federally listed species (Petition, p. 36).

Evaluation of Information Provided in the Petition and Available in Service Files

The eastern small-footed bat is State-listed as threatened, endangered, or a species of special concern throughout the majority of its range, and the northern long-eared bat is State-listed or proposed for listing in several States, including in areas affected by WNS. Regulatory protections for State-listed species vary by individual States, but, in general, State-listed species do not receive the same avoidance, minimization, compensation, or monitoring measures as those afforded to federally listed species.

Although some non-listed bat species such as the eastern small-footed bat and northern long-eared bat may receive ancillary benefits from operational changes meant to provide conservation benefits for listed bat species at wind power projects, this assumption is speculative. Federal oversight of wind power projects is limited, and therefore, the threat of direct take or habitat loss from these projects may be inadequately regulated.

The petitioner asserts that regulatory mechanisms are inadequate for the management of WNS. There are no existing regulatory mechanisms specifically designed to regulate the spread of fungal diseases such as *G. destructans* associated with WNS. Therefore, there are no regulations to analyze for adequacy of addressing the threat of WNS. The Service discusses nonregulatory management strategies for addressing WNS under Factor C above.

We find the information provided in the Petition and other information in our files present substantial scientific or commercial information indicating that the inadequacy of existing regulatory mechanisms to manage the impacts of forestry; wind energy development; and, oil, gas, and mineral extraction may be a threat to the northern long-eared bat and the eastern small-footed bat. As explained above in Factor A, we find the information provided for agricultural and residential development to be not substantial, therefore, there is no substantial information on the inadequacy of existing regulatory mechanisms associated with those activities. We will further investigate the adequacy of existing regulatory mechanisms for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

E. Other Natural or Manmade Factors Affecting the Species' Continued Existence

The petitioner states that other natural or manmade factors affecting the continued existence of eastern small-footed bats and northern long-eared bats include environmental contaminants, climate change, disturbance at hibernacula or maternity roosts, and prescribed burning.

Environmental Contaminants

Information Provided in the Petition

The petitioner asserts that environmental contaminants may pose a threat to bat populations (Petition, p. 23–26). Bat species with long lifespans, such as the northern long-eared bat (up to 19 years) and eastern small-footed bat (up to 11 years), have more time to come in contact with, and therefore bioaccumulate, insecticides and other toxic pollutants (Clark and Shore 2001, p. 166). For example, substantial wildlife mortality has been linked to contaminate leaching and spills, with bats often disproportionately affected (Eisler and Wiemeyer 2004, p. 48).

The petitioner states that mercury is a neurotoxin linked to adverse health effects in mammals, including reduced immune function, impaired function of the central nervous system, and compromised reproductive ability, and that cyanide can cause mortality due to asphyxiation (Petition, p. 24). The petitioner refers to a study by Schweiger *et al.* (2006, Petition, p. 24) that provides evidence that insectivores, such as bats, are affected by high levels of mercury in the environment. Elevated levels of mercury have been documented in bats, including the northern long-eared, in the States of Virginia, Arkansas, and Kentucky (Yates and Evers 2006; Massa and Grippo 1999; Clark *et al.* 2007; all as cited in the Petition, p. 24). In the northeastern United States, mercury-sensitive areas include forested regions with shallow surficial (occurring on or near the surface of the earth) materials, abundant wetlands, and low-productivity surface waters (Driscoll *et al.* 2007, p. 2).

Cyanide solutions from mining operations are typically stored in sludge ponds or heaps, where animals may be attracted to drink (O'Shea *et al.* 2000, p. 206). However, cyanide does not biomagnify (increase in concentration of a substance in the tissue of organisms at successively higher levels of the food chain) or persist in ecosystems, and sublethal doses may be ingested without apparent detrimental harm (O'Shea *et al.* 2000, p. 206; Eisler *et al.* 1999 as cited in the Petition, p. 24).

Contemporary classes of pesticides (*e.g.,* organophosphates, pyrethroids, neonicotinoides) are suggested to have sublethal to lethal effects on many bat populations. Some pesticides, such as organochlorine, may persist in the environment, accumulate in food chains, and affect insectivores, such as bats (Clark *et al.* 1980, p. 138; Clark and Shore 2001, p. 157). A small sample of northern long-eared and federally endangered Indiana bat carcasses tested positive for organophosphates, raising concern regarding their link to mortality (Sparks 2006, p. 3). During extreme fat depletion while in hibernation, accumulated contaminants in fat stores risk mobilization, which can prove lethal (Clark and Shore 2001, pp. 166, 177–178; Secord *et al.* 2009, p. 2). Sublethal doses may also affect thermoregulation, reproduction, immune function, motor coordination, metabolic rates, and foraging behavior (Clark and Shore 2001, pp. 172, 177; Swanepoel *et al.* 1999, p. 175; Petition, p. 25). Thus, a sublethal dose that compromises motor coordination may reduce foraging efficiency for a few hours or days, and could cause starvation-related mortality (Sparks 2006, p. 6). Pesticide use may also influence the abundance and diversity of local insect prey resources (Wickramasinghe *et al.* 2004, p. 1289).

Evaluation of Information Provided in the Petition and Available in Service Files

There is considerable uncertainty regarding adverse impacts to northern long-eared and eastern small-footed bats from pesticides and other potential contaminants. Undetermined mortality cases of individual northern long-eared bats, which seem to have a toxicological implication, have been recorded (Sparks 2006, p. 3). Additional suspected bat mortalities from organochlorine pesticide exposure were documented in the late 1970s and 1980s in several Missouri caves (Service 2007, p. 93). Eight Mexican free-tailed bats were also found dead under a bat house near a pond that had recently been treated with Diquat® (Service 2007, p. 100).

Although environmental contaminants may adversely impact northern long-eared and eastern small-footed bats, the petitioner did not provide the referenced information for some citations used in the Petition, and therefore, we were unable to locate or substantiate claims from these reported sources. In addition, information in our files is not sufficient to establish that environmental contaminants may be a threat to the eastern small-footed or northern long-eared bats. We have no readily available information indicating that species-level impacts are occurring from potential pesticide or other contaminant use throughout the range of the northern long-eared and eastern small-footed bats. Therefore, we find that the Petition does not present substantial information for this factor. We will, however, further investigate this factor for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Climate Change

Information Provided in the Petition

The petitioner asserts that climate change will likely impact northern long-eared and eastern small-footed bats (Petition, p. 26). Climate change is expected to alter seasonal ambient temperatures and precipitation patterns across regions (Adams and Hayes 2008, p. 1115), which may affect insect prey distribution, abundance, and phenology (life cycle events influenced by seasonal and interannual variation in climate) (Bale *et al.* 2002, p. 11). In addition, Northeast winters within the ranges of the eastern small-footed bat and northern long-eared bat are projected to become shorter in duration and warmer, with more frequent freeze and thaw cycles (Gu *et al.* 2008, p. 261).

Although milder winter conditions may permit bats to enter hibernacula later than usual, declining availability of late-fall food resources may decrease individual fat reserves available for overwinter survival (Petition, p. 26). Moreover, warmer or more variable winter temperatures may cause bats to break torpor more frequently during hibernation (Petition, p. 26), sharply increasing energy demands on limited fat reserves as they increase body temperature and metabolic rates (Humphries *et al.* 2002, p. 315). Eastern small-footed bats often hibernate in areas more susceptible to temperature fluctuations, such as small rock crevices, under rock slabs, or in other microhabitats, which may make them more susceptible to arousal and energy depletion (Rodenhouse *et al.* 2009, p. 251). Warmer winter temperatures may also disrupt bat reproductive physiology. In captivity, spermatozoa stored in the female reproductive tract lose their viability if suitable hibernation conditions are not maintained. If unsuitable hibernation conditions similarly affect individuals in the wild, reproductive success may become diminished (Jones *et al.* 2009, p. 7).

Evaluation of Information Provided in the Petition and Available in Service Files

Projections of climate change impacts to the northern long-eared bat and eastern small-footed bats are speculative. Information in the Petition and in our files is not sufficient to establish that climate change may be a threat to the eastern small-footed or northern long-eared bats. Therefore, we find that the Petition does not present substantial information for this factor. We will, however, further investigate this factor for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Disturbance at Hibernacula or Maternity Roosts

Information Provided in the Petition

The petitioner asserts that disturbance at hibernacula and maternity roosts may negatively affect the northern long-eared bat and eastern small-footed bat (Petition, pp. 26–27). Bat hibernacula and maternity roost locations are frequently used for recreational, commercial, and scientific activities (*e.g.,* caving, rock climbing, mineral extraction, and research), which may increase disturbance frequency (Petition, pp. 26–27). Disturbance of winter hibernacula can increase arousal from a state of torpor, which is energetically expensive and known to cause high rates of winter mortality through accelerated fat loss and starvation (see Factor C above). Increased arousal, therefore, may lead to an increased risk of premature energy store depletion and starvation.

The petitioner asserts that eastern small-footed bat maternity roosts may be at risk from recreational disturbance (*e.g.,* rock climbing) as colonies have been found under exposed rocks on open ridges, outcrops, and cliff faces (Erdle and Hobson 2001, p. 6; Petition, p. 27). In addition, the petitioner notes increased developmental pressures to convert abandoned railway tunnels for recreational uses, such as bicycle trails. For example, the proposed development of the abandoned Indigo Tunnel in Maryland to a bicycle trail would potentially affect the third largest eastern small-footed bat hibernating population, the largest population as yet unaffected by WNS (Petition, p. 27).

Vandalism is also known to be a major issue at some hibernacula (Tuttle 1979, p. 3). According to the Petition, intentional harm to bat colonies is a common occurrence; Tuttle (1979, p. 3) reports researchers finding sticks, rocks, spent shotgun and rifle shells, fireworks fragments, and smoke stains on cave ceilings at many caves. Intentional killing of bats at both commercial and noncommercial caves by clubbing, stoning, burning, shooting, and other means is well documented as a cause of substantial bat mortality (Tuttle 1979, pp. 7–8). Concerns about public health and the transmission of rabies, contamination of homes or other buildings by guano, and the general stigma associated with bats inspire many attempts to eradicate bats from both natural habitat and human structures (Tuttle 1979, p. 8).

Evaluation of Information Provided in the Petition and Available in Service Files

The petitioner cites several publications to support assertions made in the Petition; however, the petitioner does not include reference information for some citations (such as Greenhall 1973, and Trombulak *et al.* 2001), and we are unable to locate or substantiate claims from these reported sources. However, in general, we would expect that destruction of or disturbance to habitat, particularly habitat required for maternity use, roosting, and hibernation, may impact local populations.

We reviewed cited and referenced publications that are readily available in our files, and we find this information suggests the assertions made by the petitioner are accurate. In particular, Caceres and Pybus (1997), Tuttle (1979), and Thomas *et al.* (1990) identified threats from disturbance and vandalism of hibernacula by human activities. The repeated arousal from a state of torpor due to human disturbance likely increases the energy demands made of hibernating northern long-eared bats, which forces individuals to expend limited energy stores and may affect overwinter viability and other life history events. Disturbance of northern long-eared and eastern small-footed bat roosts and hibernacula from human activities and development has occurred (Petition, p. 17) and is likely to continue in the future. Therefore, we find the Petition and other information in our files present substantial information indicating that disturbance or vandalism to maternity roosts and winter hibernacula may be threats to the northern long-eared bat and the eastern small-footed bat.

Prescribed Burning of Forested Understory Habitats

Information Provided in the Petition

The petitioner asserts prescribed burns of forested understory habitats may negatively impact bat species through habitat loss or adverse effects of smoke, especially in the southeastern United States in the winter season, although most impacts to bat populations due to burns are poorly documented or researched (Carter *et al.* 2000, p. 139; Petition, p. 28). The prescribed burns may destroy snags in mid to late stages of decay, which otherwise would provide suitable bat roosts (Carter *et al.* 2000, p. 139; Horton and Mannan 1988, p. 41). Although burns may destroy current roost habitat, most bat species use multiple forest roosts, are able to fly at speeds that should allow for their escape, and are able to carry their young for short distances, all of which may mitigate threats caused by the burn (Carter *et al.* 2000, p. 140). In addition, prescribed burns may create beneficial snag habitat (although newly created snags may not be immediately useable for roosting), may modify or improve foraging habitat, and may increase arthropod abundance (Carter *et al.* 2000, p. 139).

Winter burns that create smoke upwind from a cave's breathing entrance could fill the cave with smoke, potentially disturbing or killing cave-hibernating bat species (Carter *et al.* 2000, p. 141; Petition, p. 28). Summer burns may adversely impact eastern small-footed bat roost habitat, which is often located in fire-prone or fire-reliant plant communities (Carter *et al.* 2000, p. 141).

Evaluation of Information Provided in the Petition and Available in Service Files

Although it has been theorized that prescribed burns of forested understory habitat may adversely impact northern long-eared and eastern small-footed bats, the Petition and information in our files do not present substantial information indicating that prescribed burning may be a threat to the northern long-eared bat and the eastern small-footed bat. Prescribed burns may destroy existing roost habitat, create beneficial snag habitat, or modify or improve foraging habitat at a local scale. However, the potential impacts to bat populations due to burns are poorly documented or researched. We will, however, further investigate prescribed burning as a threat for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Summary of Factor E

In summary, we find the Petition and other information in our files presents substantial information indicating the present or threatened disturbance of summer roosts and winter hibernacula by recreational activities and vandalism may be threats to the northern long-eared bat and the eastern small-footed bat. The Petition and other information in our files do not present substantial information indicating that environmental contaminants, climate change, and prescribed burns may be threats to the northern long-eared bat and the eastern small-footed bat. We will, however, further investigate these factors for both the northern long-eared and eastern small-footed bats in our 12-month status reviews.

Finding

On the basis of our determination under section 4(b)(3)(A) of the Act, we have determined that the Petition presents substantial scientific or commercial information indicating that listing the eastern small-footed bat and the northern long-eared bat throughout their entire ranges may be warranted. Information in the Petition and in our files indicates that the continued existence of these two species may be threatened by destruction, modification, or curtailment of habitat from logging (northern long-eared bat); oil, gas, and mineral development (eastern small-footed and northern long-eared bats); and wind energy development (eastern small-footed and northern long-eared bats) (Factor A); WNS (eastern small-footed and northern long-eared bats) (Factor C); inadequacy of existing regulatory mechanisms for impacts related to development; forestry; wind energy development; and oil, gas, and mineral extraction (eastern small-footed and northern long-eared bats) (Factor D); and other natural or manmade factors such as disturbance at hibernacula and maternity roosts by recreational activities or vandalism (eastern small-footed and northern long-eared bats) (Factor E). The Petitioner does not present substantial information that the eastern small-footed bat and northern long-eared bat are threatened by overutilization for commercial, recreational, scientific, or educational purposes (Factor B). Because we have found that the Petition presents substantial information indicating that listing the eastern small-footed bat and northern long-eared bat may be warranted, we are initiating a status review for both species to determine whether listing either of these species or both of these species under the Act is warranted.

The ''substantial information'' standard for a 90-day finding differs from the Act's ''best scientific and commercial data'' standard that applies to a status review to determine whether a petitioned action is warranted. A 90-day finding does not constitute a status review under the Act. In a 12-month finding, we determine whether a petitioned action is warranted after we have completed a thorough status review of the species, which is conducted following a ''substantial'' 90-day finding. Because the status review may provide additional information, and because the Act's standards for 90-day and 12-month findings are different, as described above, a ''substantial'' 90-day finding does not mean that the status review will result in a ''warranted'' finding.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov* and upon request from the Pennsylvania Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Author

The primary authors of this notice are the staff members of the Pennsylvania Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authority: The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: May 26, 2011.

Rowan W. Gould,

Acting Director, U.S. Fish and Wildlife Service.

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