Biological Opinion and Incidental Take Statement for the Indiana Bat (*Myotis sodalis*) and Northern Long-eared Bat (*Myotis septentrionalis*) for The East Ohio Gas Company's Western Access II Project in Harrison and Tuscarawas Counties, Ohio.

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INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the U.S. Army Corps of Engineers (Corps) proposed issuance of a Nationwide Permit under Section 404 of the Clean Water Act to Dominion - The East Ohio Gas Company (EOG) for the Western Access II Project (WAII Project), and the effects on the Indiana bat (*Myotis sodalis*; IBAT) and northern long-eared bat (*Myotis septentrionalis*; NLEB) in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The Corps' application number for the project is #LRH-2014-00944. The Corps' request for formal consultation was received on June 25, 2015.

This BO is based on information provided in the Biological Assessment (BA). A complete administrative record of this consultation is on file at the Service's Columbus Ohio Field Office (COFO).

Interim 4(d) for the Northern Long-eared Bat

On April 2, 2015, the Service published a species-specific rule pursuant to section 4(d) of the ESA for NLEB (80 FR 17974). Section 4(d) of the ESA states that:

> *Whenever any species is listed as a threatened species ... the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species* (16 U.S.C. 1533(d)).

The Service's interim 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, as follows:

(1) Take that is incidental to forestry management activities, maintenance/limited expansion of existing rights-of way, prairie management, projects resulting in minimal (<1 acre) tree removal, provided these activities:
   a. Occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula;
   b. Avoid cutting or destroying known, occupied roost trees during the pup season (June 1–July 31); and
   c. Avoid clearcuts (and similar harvest methods, *e.g.*, seed tree, shelterwood, and coppice) within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1–July 31).

(2) Removal of hazard trees (no limitations).

(3) Purposeful take that results from
   a. Removal of bats from and disturbance within human structures and
   b. Capture, handling, and related activities for northern long-eared bats for 1 Year following publication of the interim rule.

Thus, any take of NLEB occurring in conjunction with these activities that complies with the conservation measures, as necessary, is exempted from section 9 prohibitions by the interim 4(d)

rule, and does not require incidental take authorization. We distinguish these activities from other actions throughout the accompanying BO.

However, the interim 4(d) rules do not afford exemption from the ESA's section 7 procedural requirements. Therefore, consultation is required when actions (even those within the scope of the interim 4(d) rule) are funded, authorized or carried out by a federal agency. This is because the purpose of section 7 consultation is broader than the mere evaluation of take and issuance of an Incidental Take Statement; such consultations fulfill the requirements of section 7(a)(2) of the ESA, which directs that all federal actions insure that their actions are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat.

CONSULTATION HISTORY

The Corps determined that the WAII Project is likely to adversely affect the IBAT and NLEB, and submitted a request for initiation of formal consultation to the Service on June 25, 2015. In a June 29, 2015 response letter, the Service concurred with the Corps' determination, and agreed that the initiation package was complete in accordance with 50 CFR §402.14, and that the timeframe for formal consultation had begun effective June 25, 2015.

Date	**Event**
August 5, 2014	COFO receives Dominion's letter (dated July 23, 2014) requesting technical assistance for the Western Access II Project.
August 15, 2014	COFO sends technical assistance letter regarding federally listed species to Dominion
April 29-30, 2015	Dominion phone call to COFO requesting additional technical assistance and clarification regarding tree clearing and federally listed bats
May 1, 2015	COFO requests additional information on the project from Dominion
May 6, 2015	Dominion emails additional project information to COFO requesting technical assistance regarding federally listed bats
May 6, 2015	COFO and Dominion conference call to discuss additional project data submitted
May 7, 2015	COFO and Corps phone call to discuss project need for a Corps permit
May 7, 2015	COFO and Dominion conference call to discuss the Service's review of the project and timing of consultation between the Service and the Corps
May 8, 2015	COFO and Dominion exchange email and phone calls to discuss bat survey

	dates and project timing
May 11, 2015	COFO email to Dominion requesting additional project information regarding tree clearing
May 12, 2015	Dominion submits additional data to COFO via email
May 13, 2015	Email exchanges between COFO and Dominion for clarification of tree clearing acreages
May 18, 2015	COFO sends technical assistance letter to Dominion providing options for ESA compliance regarding the Corps permit
May 19, 2015	COFO and Dominion phone discussion to clarify the consultation process
May 27, 2015	COFO and Dominion conference call to discuss bat conservation measures
May 28, 2015	COFO receives draft BA from Dominion
June 1, 2015	Dominion notifies COFO that they are submitting a revised draft BA
June 2, 2015	Dominion submits revised draft BA to COFO
June 5, 2015	Conference call between COFO, Dominion, EOG, and Muskingum Watershed Conservancy District to discuss proposed bat mitigation
June 5, 2015	COFO submits comments on revised draft BA to Dominion
June 8, 2015	Dominion submits final draft BA to COFO via email. Hardcopy received June 9, 2015
June 10, 2015	COFO notifies Corps that final draft BA addresses the Service's comments to Dominion on June 5, 2015
June 25, 2015	Corps submits letter and initiation package requesting initiation of formal consultation
June 29, 2015	COFO sends letter to Corps acknowledging receipt of complete initiation package. Formal consultation initiated June 25, 2015
July 13, 2015	COFO sends draft BO to Corps for review
July 30, 2015	Corps sends comments on draft BO to COFO
July 31, 2015	COFO issues final BO to Corps concluding formal consultation

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The federal action evaluated in this biological opinion (BO) is the issuance of a Nationwide Permit (NWP) under Section 404 of the Clean Water Act by the Corps to authorize the construction of the EOG WAII Project. The new pipeline will traverse approximately 86,498 feet (16.4 miles) for the construction of a 36" diameter gas transmission pipeline. The WAII Project also includes the construction of three measuring and regulator (M&R) stations. The majority of the pipeline route is located within and parallel to existing pipeline rights-of-way (ROWs). The project will require temporary impacts to jurisdictional wetlands and streams.

The Corps is responsible for issuance of permits to discharge dredged or fill material into waters of the U.S., including wetlands, under Section 404 of the Clean Water Act (33 USC § 1344; 33 CFR 320-332). EOG has applied for a 404 permit for the construction of the WAII Project at wetland and waterbody crossings throughout the project route. The Corps permit area for these jurisdictional waters is limited to the area of direct impacts, as a result of the discharge of dredged and/or fill material into water of the U.S. and the immediate adjacent uplands directly affected by authorizing the discharge of dredged and/or fill material. For the WAII Project, the jurisdiction of the Corps permit includes 146 stream and wetland crossings and the immediate adjacent uplands. The Corps has stated that their statutory authority is limited to the permit areas of NWP actions.

The Service is issuing this BO pursuant to section 7 of the ESA. Direct and indirect effects of the federal action (issuance of a NWP) and the interrelated or interdependent activities are analyzed to ensure they are not likely to jeopardize the continued existence of federally listed or proposed endangered or threatened species. Indirect effects of the federal action include, "…effects that are caused by or result from the action, are later in time but are reasonably certain to occur…" Interdependent actions have no independent utility apart from the proposed action, and interrelated actions are part of a larger action and depend on the larger action for their justification (50 CFR §402.02). Issuance of NWPs will result in the construction, operation, and maintenance of the WAII Project. Therefore, the focus of this BO is the effects of the WAII Project, including all construction, operation, and maintenance activities associated therewith, regardless of permit jurisdiction or land ownership.

The project is located in Union and Mill Townships in Tuscarawas County and Monroe, Franklin, Stock, Nottingham, and Cadiz Townships in Harrison County, Ohio. The project area is located approximately 30 miles south of Canton, Ohio and 58 miles west of Pittsburgh, Pennsylvania. Smaller towns located closer to the project area include Dennison, Uhrichsville, and Cadiz, Ohio. The project is located in an area that contains several other utility ROWs.

EOG is proposing to install 86,498 feet (16.4 miles) of 36-inch diameter natural gas pipeline. The pipeline will be installed in existing and new utility ROWs. The new ROW includes a section that is 1,733 feet (0.3 miles) and located east and west of Minksville Road. A second

section of new ROW is 9,813 feet (1.9 miles) and extends from north of Cassville Road to the southeastern terminus of the project area. The second section of new ROW has been entirely cleared of trees prior to March 31, 2015, except for a small portion (approximately 270 feet) at the furthest southeast limit before the final turn south. Approximately 16.4 acres within the second section of new ROW has already been clear-cut and another 4.9 acres of trees need to be cleared within the new ROW.

The remainder of the pipeline (14.2 miles) will be installed within existing utility ROWs for EOG's TPL 2 and TPL 3 pipelines and adjacent to existing utility ROWs in use by other utility companies. Existing EOG ROWs for TPL 2 and TPL 3 are currently maintained with a cleared width of 50 to 60 feet wide (25 to 30 feet on either side of the pipeline centerline) along these pipelines. Since the new pipeline must be installed at least 30 feet from the existing TPL lines, the existing ROWs will be cleared an additional 55 to 65 feet for construction activities. The final total ROW width will be 90 feet wide (30 to 40 feet wider than what they currently are). Segments that are installed adjacent to non-EOG ROWs will require the ROW to be cleared an additional 100 feet from the edge of the existing ROW. Clearing along the existing TPL 2 and TPL 3 ROWs will total approximately 74.3 acres. Clearing adjacent to non-EOG ROWs will total approximately 6.9 acres.

A disturbance width of 115 feet along the entire pipeline, reduced to 50 feet through wetlands and streams, is necessary for pipeline installation. The 115 foot wide work area will include existing cleared ROWs along TPL 2 and TPL 3 as detailed above. All ground disturbing impacts along the linear portion of this project will be temporary, as the grade will be restored to pre-construction contours once construction is completed. In addition, the final maintained ROW width will be 90 feet, which will allow for an area of approximately 25 feet wide along the entire ROW to naturally revegetate after construction. The linear portion of the project will temporarily disturb approximately 234.6 acres and require approximately 86.1 acres of tree clearing. An area of approximately 178.9 acres will be maintained, by mowing and brush-hogging, for the permanent easement.

In addition, three M&R stations are to be constructed along the pipeline. The northern station (Holmes Station) is located at the northern terminus of the project area and totals 4.5 acres. This station will require approximately 1.5 acres of tree clearing. The central station (Plum Run Station) is located approximately 3,445 feet northwest of Plum Run Road and totals 4.4 acres and will require 3.9 acres of tree clearing. The southern station (Cadiz West Station) is located at the southern terminus of the project area and totals 6.4 acres and will require 0.5 acres of tree clearing. The clearing associated with each station will be permanently maintained.

Activities associated with the project will result in temporary impacts to 3.657 acres of wetland, 59.5 linear feet of perennial stream (measured bank to bank), 81.5 linear feet of intermittent stream (measured bank to bank), and 39 linear feet of ephemeral stream (measured bank to bank). In addition, 95 linear feet (measured upstream to downstream) of intermittent stream and 200 linear feet (measured upstream to downstream) of ephemeral stream will be temporarily impacted during construction of Holmes Station. A total of 0.011 acres within one forested

wetland will be temporarily impacted for this project. The trees within this wetland remain and will be cleared as part of the summer clearing effort. The majority of the onsite streams have a forested riparian area at some point within the project area. However, since the construction area will be reduced to 50 feet wide along streams, the amount of riparian clearing is expected to be minimal.

Construction

Construction of the pipeline will start on the southern side of the project, at the Cadiz West interconnect site, and will move north in a linear fashion. It is expected that once construction is underway, the contractor will install approximately 2,000 to 2,500 feet of pipeline per day. While the pipeline is under construction, the M&R stations will also be under construction. All ground disturbance within the pipeline ROW will be temporary and will be returned to pre-construction contours after construction. All upland areas will be seeded and mulched. Wetlands will be allowed to revegetate naturally. The M&R stations will have a layer of limestone over bare ground. It is not expected that this project will create new impervious surfaces.

The anticipated noise level ranges for equipment associated with this project are approximately 60 to 106 decibels with the highest levels occurring during tree clearing (chainsaws). Chainsaws range from 85 to 106 decibels. Excavators and dozers range from 85 to 93 decibels. Vehicle idle ranges from 60 to 63 decibels.

The tentative construction schedule dictates that construction activities will be occurring six days a week during daylight hours only. Crews will likely work from 7:00 a.m. until 5:00 p.m. Starting in mid-September, once daylight hours become limited, generator powered lighting may be used in short periods at dawn and dusk. Lighting proposed to be used will have a maximum height of 32 feet and will produce 440,000 lumens. Noise produced by the generator will be approximately 70 decibels.

Rock and/or substrate blasting is expected to be necessary. The extent of the blasting is unknown and will be done at the contractors' discretion. According to the results of preliminary soil testing, blasting is expected to occur along less than 11,000 feet of the pipeline trench. If blasting takes place, it will have a brief noise impact larger than a chainsaw, approximately 120 decibels. However, this noise impact will not be constant and will be limited to very specific locations. It is anticipated that blasting will only occur after August 1, 2015, as contractors will be clearing and grading the ROW for the first few weeks.

There will be no onsite burning of brush material. Tree trunks will either be hauled offsite or left with the property owner. Brush will be chipped and taken off of the ROW or left with the property owner. Pollution prevention measures, as stated in the Stormwater Pollution Prevention Plan (SWPPP), will be installed, implemented, and maintained to minimize the discharge of pollutants from any wash water. Waste generation is expected to be minimal.

Construction access to the right of way will be located off Township and County roads, property owner access drives, and via the interconnect stations. Equipment and material will be staged at a yard in Dennison, Ohio (next to a railroad spur), an existing laydown yard off Highway 250 in Stock Township, a cleared location off McGonigal Road, and via the interconnect station sites. These areas are expected to contain equipment, trailers, and material. Spill Prevention Control and Countermeasures (SPCC) plans are being prepared for the storage of diesel and gasoline on the contractor yard in Dennison, Ohio.

Project Area Restoration

The project area will be stabilized with vegetation planting in accordance with the permanent and temporary stabilization requirements in the NPDES discharge permit. Temporary fills required in streams to facilitate structure construction or provide construction access will be removed and the areas will be restored to the original grade and vegetated as specified in the permit authorizations from the Corps and Ohio Environmental Protection Acency.

Operations and Maintenance

Once the project is complete, pipeline and stations will be fully operational and will not require any major ground disturbing work. Potential impacts that may occur during routine maintenance and operation of the pipeline ROW and stations include storm water runoff at stations, snow and ice removal from access roads, and mowing.

Routine maintenance activities may occur once the project is completed. Mowing/brush hogging activities are expected to take place once every 1-2 years. In addition, painting of above ground piping will be required along with adding limestone to the stations and roads at regular intervals. No impacts to wetlands or perennial streams will take place without notification to the Corps and no tree clearing will be done outside of the seasonal tree clearing dates (October 1 through March 31) without Corps and Service approval.

Conservation Measures

Conservation measures are those actions taken to benefit or promote the recovery of the species. These actions taken by the federal agency or the applicant that serve to minimize or compensate for project effects on the species under review and are included as an integral portion of the proposed action.

Proposed bat conservation measures were included in the BA. The Service recognizes that, individually and/or cumulatively, these bat conservation measures contribute to the avoidance and minimization of adverse effects to IBATs and NLEBs but that these measures do not necessarily eliminate all adverse effects that may result from the proposed action. These conservation measures are included below and by reference. EOG has agreed in the BA to

implement the following conservation measures as part of this project in order to avoid and/or minimize the effects of the proposed action on the IBAT and NLEB.

1. Tree clearing within the Holmes and Cadiz West Stations will be delayed until after October 1, 2015 to avoid potential impacts to the IBAT and NLEB during the summer maternity season. Total tree clearing for these two stations is approximately two (2) acres.

2. Approximately one-half (46 acres) of the proposed clearing will occur after August 1, 2015 thus minimizing impacts to non-volant bats.

3. The majority of the WAII Project will be constructed within and adjacent to existing ROWs thus minimizing clearing and fragmentation of forested habitat for IBATs and NLEBs.

4. Narrowing of the project corridor from 115' to 50' through wetlands and streams. This minimizes clearing and disturbance to bat roosting and foraging habitat in riparian areas.

5. Any tree clearing associated with operation and maintenance activities will be conducted seasonally (between October 1 and March 31) thereby avoiding direct effects to bats during the summer roosting and foraging period.

6. EOG intends to compensate for the loss of bat habitat resulting from project tree clearing. EOG is working with the Muskingum Watershed Conservancy District on a mitigation plan to reforest approximately 200 acres of former strip mine land in Coshocton County, Ohio.

7. EOG will implement pollution prevention measures through their Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will minimize the discharge of pollutants from waste and wash water to help protect water quality.

8. Best Management Practices will be used to maintain effective erosion and sediment controls.

9. EOG will clearly mark the clearing limits to ensure the proposed amount of tree clearing is not exceeded.

10. Environmental inspectors will ensure compliance with the SWPPP, erosion and sediment controls, and ensure clearing limits are not exceeded.

11. EOG and its contractors will utilize existing staging and laydown yards and access the project area utilizing existing access roads.

In addition to the proposed conservation measures above, EOG previously removed approximately 200 potential roost trees and 16.4 acres of forested habitat between October 1, 2014 and March 31, 2015 to minimize direct adverse effects to bats.

Currently there are no known occupied NLEB roost trees or hibernacula within 0.25 miles of the

project area. Therefore, the portion of the proposed action occurring within 100' of existing ROWs is in compliance with the interim 4(d) rule for NLEB. Furthermore, the Corps and EOG have committed to the following conservation measures as part of the project description for the portion of the project within 100' of existing ROWs:

1) All proposed activities will occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula.

2) The Corps and EOG will ensure that cutting or destroying known, occupied roost trees during the pup season (June 1–July 31) is avoided.

3) The Corps and EOG will ensure that no clearcuts occur within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1–July 31).

Action Area

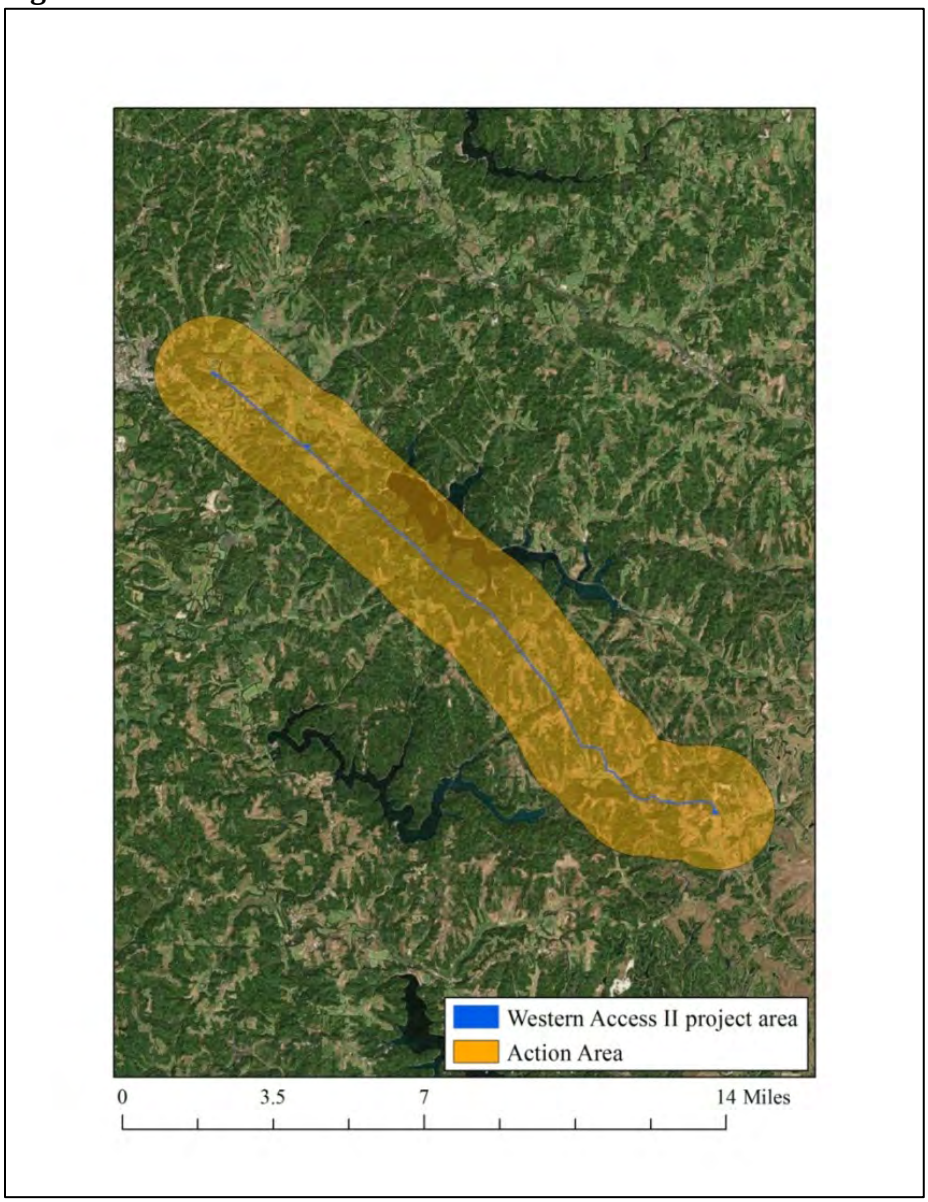
In 50 CFR §402.02 "action area" is defined as, "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area is not limited to the footprint of the action and should consider the effects to the environment resulting from the action. Within a set action area, all activities that can cause measurable or detectable changes in land, air, and water or to other measurable factors that may elicit a response in the species or critical habitat are considered. The action area is not defined by the range of the species that would be impacted; rather it is defined by the impacts to the environment that would elicit a response in the species (Service and NMFS 1998). Therefore, the action area includes the WAII Project footprint and the geographic extent of the area that could be affected by the construction, operation, and maintenance of the pipeline and M&R stations either directly, indirectly, or through interrelated or interdependent actions.

The proposed WAII Project will include clearing and grading of the temporary and permanent ROWs and M&R stations; trenching for the pipeline installation; installing the pipeline; re-grading, mulching, and seeding of workspaces and the temporary and permanent ROWs; and mowing and brush-hogging of the permanent ROW. It includes all areas that will be physically impacted, as well as areas that may be impacted by noise, or downstream movement of sediments and chemicals.

Of all the project activities, clearing and construction noise is expected have the most far reaching changes to the natural environment. The increase in noise disturbance during clearing and construction could encompass an area up to 1.3 miles (6,719 ft) from the actual work limits. This distance was estimated based upon: (1) the estimated existing ambient noise level in the construction area of 42 dBA, (2) the typical reduction level of 6 dBA per doubling of distance, and (3) the highest noise level produced during project construction is estimated to be 106 dBA with sporadic levels of up to 120 dBA during blasting (The Engineering ToolBox 2015; NoiseNet.org 2015; Corps 2015).

As described above, issuance of NWPs will result in the construction, operation, and maintenance of the WAII Project. The construction, maintenance, and operation of the WAII Project will result in direct effects and indirect effects throughout the entire pipeline and M&R stations. Therefore, the action area for this consultation is the entire 16.4 mile length of the pipeline, including the permanent ROW and temporary ROW, and the M&R stations, and a buffer distance of 1.3 miles around all of these areas (Figure 1). The 1.3-mile buffer distance is used to incorporate all potential effects of the project to IBATs and NLEBs. The action area encompasses approximately 30,806 acres (~48.1 sq. miles)

Figure 1. Action Area



STATUS OF THE SPECIES

Indiana Bat

Refer to the IBAT (*Myotis sodalis*) Draft Recovery Plan: First Revision (USFWS 2007) for the best available information on IBAT life history and biology, threats, distribution and overall status. The following is summary from that plan.

Life History and Biology

The IBAT is a temperate, insectivorous, migratory bat that hibernates colonially in caves and mines in the winter. In spring, reproductive females migrate and form maternity colonies where they bear and raise their young in wooded areas. Males and nonreproductive females typically do not roost in colonies and may stay close to their hibernaculum or migrate to summer habitat. Summer roosts are typically behind exfoliating bark of large, often dead, trees. Both males and females return to hibernacula in late summer or early fall to mate and enter hibernation.

Summer habitat and ecology

Suitable summer habitat for IBATs consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh (12.7 centimeter) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat.

In summer, female IBATs form maternity colonies where they bear and raise their pups. Members of the same maternity colony exhibit strong site fidelity to summer roosting and foraging areas and will return to the same summer range annually. Maternity colony size averages between 50 to 80 adult females (Whitaker and Brack 2002).

Maternity colony habitats include riparian, bottomland, and floodplain forests, wooded wetlands, and upland forest communities. Maternity roost sites are most often under the exfoliating bark of dead trees, although live trees, especially shagbark hickory, are also used if they have flaking bark under which the bats can roost. Maternity colonies typically use 10 to 20 trees each year, but only one to three of these are primary roosts used by the majority of bats for some or all of the summer (Callahan 1993, Callahan *et al.* 1997). Roost trees can vary considerably in size, but primary roosts are usually large diameter snags (dead trees). Although male IBATs may roost in trees less than12.7 cm (5 in) dbh, suitable roosting habitat is defined as forest patches with trees of 12.7 cm (5 in) dbh or larger (USFWS 2015a). Although roost trees are often in mature mostly

closed-canopy forests, maternity roost trees, especially in Ohio, are typically in open areas exposed to solar radiation (i.e., sunlight on the roost area for at least part of the day). These trees may be in canopy gaps in the forest, in a fence line, or along a wooded edge. Roost trees, although ephemeral in nature, may be occupied by a colony for a number of years until they are no longer suitable.

IBATs eat a variety of flying insects found along rivers or lakes and in uplands. IBATs typically forage within 2.5 miles from roost trees. When the locations of roost trees are unknown, the home range for a maternity colony is considered to be all suitable habitat within 5 miles from capture points (USFWS 2011a).

Female IBATs give birth to one young each year (Mumford and Calvert 1960, Humphrey *et al.* 1977, Thomson 1982). Most births occur in mid to late June and lactation continues into July for 3 to 5 weeks (Kurta and Rice 2002). Young bats can fly at about four weeks of age after which maternity colonies begin disbanding. A few bats from maternity colonies may commence fall migration in August, although at many sites some bats remain in their maternity colony area through September and even into October (Humphrey *et al.* 1977, Kurta *et al.* 1993). Members of a maternity colony do not necessarily hibernate in the same hibernacula (Kurta and Murray 2002).

Migration

IBATs can migrate hundreds of kilometers from their hibernacula (USFWS 2007). In the Midwest Recovery Unit (RU), the maximum documented migratory distance is 574.5 km (357 mi) (Winhold and Kurta 2006). Migration is an energetically demanding behavior for the IBAT, particularly in the spring when their fat reserves and food supplies are low and females are pregnant.

Winter habitat and ecology

IBATs tend to hibernate in the same cave or mine at which they swarm (LaVal et al. 1976), although swarming has been observed at hibernacula other than those in which the bats hibernated (Cope and Humphrey 1977; MacGregor 2005, pers. comm.) and at caves that do not serve as hibernacula for the species (Brack 2006, pers. comm.). It is generally accepted that IBATs, especially females, are philopatric; that is, they return annually to the same hibernacula (LaVal and LaVal 1980). However, exceptions have been noted (Hall 1962, Myers 1964). Some IBATs apparently also move from traditional hibernacula to occupy manmade hibernacula, primarily mines, as these become available.

Most IBATs enter hibernation by the end of November (mid-October in northern areas) (Kurta et al. 1997), although populations of hibernating bats may increase throughout fall and into early January at some hibernacula (Clawson et al. 1980). IBATs usually hibernate in large, dense clusters ranging from 300 bats per square foot (LaVal and LaVal 1980) to 484 bats per square foot (Clawson et al. 1980, Hicks and Novak 2002), although cluster densities as high as

500 bats per square foot have been recorded (Stihler 2005). While the IBAT characteristically forms large clusters, small clusters and single bats also occur (Hall 1962, Hicks and Novak 2002).

IBATs often winter in the same hibernaculum with other species of bats and are occasionally observed clustered with or adjacent to other species, including gray bats (*Myotis grisescens*), Virginia big-eared bats (*Corynorhinus townsendii virginianus*), little brown bats (*Myotis lucifugus*), and NLEB (Myers 1964, LaVal and LaVal 1980).

Spring staging and fall swarming habitat and ecology

Upon arrival at hibernacula, IBATs mate and build up fat reserves by foraging, usually in close proximity to the cave. This period of activity prior to hibernation is called swarming, which is a critical part of the life cycle when IBATs converge at hibernacula, mate, and forage until sufficient fat reserves have been deposited to sustain them through the winter (Hall 1962). Swarming behavior typically involves large numbers of bats flying in and out of cave entrances throughout the night, while most of the bats continue to roost in trees during the day.

IBATs arrive at their hibernacula in preparation for mating and hibernation as early as late July; usually adult males or non-reproductive females make up most of the early arrivals (Brack 1983). The number of IBATs active at hibernacula increases through August and peaks in September and early October (Cope and Humphrey 1977, Hawkins and Brack 2004, Hawkins *et al.* 2005). Swarming continues for several weeks and mating may occur on cave ceilings or near the cave entrance during the latter part of the period. After fall migration, females typically do not remain active outside the hibernaculum as long as males. Males may continue swarming through October in what is believed to be an attempt to breed with late arriving females.

Limited mating activity occurs throughout the winter and in spring before the bats leave hibernation (Hall 1962). Young female bats can mate in their first autumn and have offspring the following year (although how many actually do so is variable), whereas males may not mature until the second year.

Shortly after emerging from hibernation in the spring, females become pregnant via delayed fertilization from the sperm that has been stored in their reproductive tracts through the winter. Most reproductive females leave immediately for summer habitat although some may linger for a few days near the hibernaculum. Members of a maternity colony do not necessarily hibernate in the same hibernacula (Kurta and Murray 2002). Males and non-reproductive females may stay near hibernacula or travel to summer habitat.

Threats

The IBAT was one of 78 species first listed as being in danger of extinction under the Endangered Species Preservation Act of 1966 because of large decreases in population size and an apparent lack of winter habitat (USFWS 1983, USFWS 1999). The 1967 federal document

that listed the IBAT as "threatened with extinction" (32 FR 4001, March 11, 1967) did not address the five factor threats analysis later required by section 4 of the 1973 ESA. The subsequent recovery plans do address threats to the species in greater detail. Threats to the species discussed in the 2007 Recovery Plan (USFWS 2007) include the following: destruction/degradation of hibernation habitat (caves and mines); loss and degradation of summer habitat, migration habitat, and swarming habitat (especially forested habitats); disturbance of hibernating bats; predation; competition; inadequacy of existing regulations, particularly regulations that protect summer roosting habitat; natural catastrophes in hibernacula, such as flooding; and, environmental contaminants.

Since 2006, white-nose syndrome (WNS) has emerged as a new threat that may have serious implications for IBAT recovery. WNS primarily affects hibernating bats. Affected bats usually exhibit a white fungus on their muzzles, ears, and wings (Blehert et al. 2009). The fungus associated with WNS has been identified as *Pseudogymnoascus destructans* (formerly *Geomyces destructans),* a previously undescribed species (Minnis and Lindner 2013). The fungus thrives in the cold and humid conditions of bat hibernacula (USFWS 2011b). The skin infection caused by *P. destructans* is thought to act as a chronic disturbance during hibernation (USGS 2010). The fungus invades living tissue, causing cup-like epidennal erosions and ulcers (Meteyer et al. 2009, Puechmaille et al. 2010). These erosions and ulcers may in turn disrupt the many important physiological functions that wing membranes provide, such as water balance (Cryan et al. 2010). Infected bats exhibit premature arousals, aberrant behavior, and premature loss of critical fat reserves which is thought to lead to starvation prior to spring emergence (Frick et al. 2010). It has been determined that *P. destructans* is the primary cause of death (Lorch et al. 2011).

It is believed that WNS is primarily transmitted through bat-to-bat contact. In addition, people may unknowingly contribute to the spread of WNS by visiting affected caves and subsequently transporting fungal spores to unaffected caves via clothing and gear (USFWS 2011b). Within the U.S., WNS has been diagnosed on the IBAT, NLEB, gray bat, little brown bat, eastern small-footed bat (*Myotis leibii*), tri-colored bat (*Perimyotis subflavus*), and big brown bat (*Eptesicus fuscus*).

First documented in a New York Cave in 2006, WNS has since spread to 26 states and five Canadian provinces, including over 50 known IBAT hibernacula. Affected hibernacula typically exhibit significant mortality (USFWS 2013). WNS has resulted in significant population declines in the Northeast and Appalachian RUs. Between 2007 and 2011, the Northeast RU lost 70 % of its IBAT population (USFWS 2013). WNS is spreading rapidly throughout the rest of the IBAT's range. WNS continues to be found at an increasing number of sites throughout the Midwest RU. In March 2011, the first case of WNS was confirmed in Ohio, in an abandoned mine in Lawrence County. Currently, 16 counties in Ohio have been confirmed as WNS positive (ODNR 2014). Declines in IBAT populations are apparent. As the disease spreads, further declines in populations are expected. The Service, with the help of States, researchers, and others, is continuing to research this evolving threat. Methods are being evaluated to stop the spread of WNS and to minimize mortality where it currently exists.

Another emerging risk to bat species is the recent increase in the number of wind turbines being constructed and operated. To date, seven IBAT fatalities have been documented at wind energy facilities (USFWS 2014a). While it is assumed that other IBAT mortalities have occurred at wind facilities, these fatalities represent the only documented take at wind facilities to date.

Status of the Indiana Bat in Ohio

The entire State of Ohio is considered to be within the core maternity range of the IBAT. However, the total population of IBATs within Ohio during the summer is unknown. The Service assumes that the IBAT may be present anywhere within Ohio during the summer where suitable habitat exists. The Service recognizes that there is no way to know the actual number of IBATs that occur in Ohio during the summer. What is known is that the total estimated population of IBATs disperses over a large area during the spring.

IBATs and their maternity colonies have been documented throughout the state. IBATs are known to hibernate in southern Ohio and south of Ohio in Kentucky and Tennessee as well as to the southwest in southern Indiana, and to the east in Pennsylvania. Researchers have documented that IBATs migrate over long distances (up to 300 miles) between summer and winter habitats (Murray and Kurta 2002). The summer and winter habitats for others may be in close proximity. However, when comparing the IBATs known wintering sites to the documented summer sites, it is apparent that there is a general trend of dispersal of IBATs from their hibernacula throughout the eastern U.S. This suggests that many IBATs are moving in a somewhat northerly direction during spring emergence. Thus, it is a reasonable assumption that a number of IBATs migrate into Ohio following hibernation where they remain for the summer.

Ohio has two confirmed IBAT hibernacula. Since 2011 when WNS was first detected in the state, winter monitoring of these hibernacula has documented a decline of approximately 50% of Ohio's winter IBAT population (USFS 2014, ESI 2014). It is not known whether this documented winter decline represents a 50% loss of IBAT due to WNS-caused mortality or if IBATs are shifting to alternative hibernacula locations due to the presence of WNS. It is possible that the winter decline may be due to a combination of both factors.

Critical Habitat

Critical habitat was designated for the species on September 24, 1976 (41 FR 41914). Eleven caves and two mines in six states were listed as critical habitat. None of these critical habitat units occur within Ohio.

Conservation Needs of the Species

To recover the IBAT, it is important to ensure genetic representation, redundancy (populations distributed across the landscape) and resiliency (sufficiently large populations). To do this, the following must be addressed:

1. Maintaining the current winter and summer range of the IBAT. The key steps of conserving and managing IBATs across the species range include establishing IBAT RUs, and maintaining self-sustaining IBAT populations in each RU.

2. Conserving and managing winter colonies and hibernacula. The key steps in conserving and managing winter colonies and hibernacula include: maintaining both large and small hibernating populations; maintaining or providing appropriate physical structure, airflow, and microclimate of the hibernacula; maintaining forest habitat surrounding hibernacula; avoiding disturbance of hibernating bats which can lead to excessive arousal and premature depletion of fat reserves; and minimizing disturbance of bats during the swarming period that can lead to disruptions in mating and foraging activity.

3. Conserving and managing maternity colonies. The key steps in conserving and managing maternity colonies include: locating maternity colonies in each RU via spring emergence radio tracking or summer surveys; ensuring a sufficient number of self-sustaining maternity colonies persist in order to support the regional population (i.e., RU population) by managing and controlling threats acting singly and cumulatively upon the fitness of maternity colonies; and, maintaining the ecological processes that ensure the continued availability of roosting, foraging, and commuting habitat needed to support maternity colonies.

4. Conserving migrating IBATs. The key steps in conserving and managing migrating IBATs include: understanding IBAT migration, including migratory routes, behaviors and differences between fall and spring migration; maintaining safe and suitable migration pathways across the species range; conserving and managing important stopover habitat, if such habitat is deemed necessary; identifying limiting factors and managing threats during migration, including minimizing/managing fatalities due to wind energy.

5. Managing the effects of WNS. There is currently no effective treatment for WNS. The key steps of managing the impacts of WNS may include: avoiding/minimizing the transmission of *P. destructans;* implementing measures to control *P. destructans* should effective, non-harmful measures become available; and restoring and protecting populations affected by WNS, with emphasis on populations that are seemingly more resilient to the disease.

Northern Long-eared Bat

Refer to the final rule (80 FR 17974) for the best available information on NLEB life history and biology, threats, distribution and overall status. The following is summary from that rule.

Life History and Biology

The NLEB is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spends summers in wooded areas. The key stages in its annual cycle are: hibernation, spring staging and migration, pregnancy, lactation, volancy/weaning, fall migration and swarming. NLEB generally hibernate between mid-fall through mid-spring each year. Spring migration period likely runs from mid-March to mid-May each year, as females depart shortly

after emerging from hibernation and are pregnant when they reach their summer area. Young are born between mid-June and early July, with nursing continuing until weaning, which is shortly after young become volant in mid- to late-July. Fall migration likely occurs between mid-August and mid-October.

Summer habitat and ecology

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

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

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

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

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

Migration

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

Winter habitat and ecology

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

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

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

Spring Staging and Fall Swarming habitat and ecology

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

After hibernation ends in late March or early April (as late as May in some northern areas), most NLEB migrate to summer roosts. Females emerge from hibernation prior to males. Reproductively active females store sperm from autumn copulations through winter. Ovulation takes place after the bats emerge from hibernation in spring. The period after hibernation and just before spring migration is typically referred to as "staging," a time when bats forage and a

limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day.

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

Threats

No other threat is as severe and immediate for the NLEB as the disease WNS. It is unlikely that NLEB populations would be declining so dramatically without the impact of WNS. Since the disease was first observed in New York in 2007 (later biologists found evidence from 2006 photographs), WNS has spread rapidly in bat populations from the Northeast to the Midwest and the Southeast. Population numbers of NLEB have declined by 99 percent in the Northeast, which along with Canada, has been considered the core of the species' range. Although there is uncertainty about how quickly WNS will spread through the remaining portions of these species' ranges, it is expected to spread throughout their entire ranges. In general, the Service believes that WNS has significantly reduced the redundancy and resiliency of the NLEB.

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

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

In areas where WNS is present, there are additional energetic demands for NLEBs. For example, WNS-affected bats have less fat reserves than non-WNS-affected bats when they emerge from hibernation (Reeder et al. 2012; Warnecke et al. 2012) and have wing damage (Meteyer et al.

2009; Reichard and Kunz 2009) that makes migration and foraging more challenging. Females that survive the migration to their summer habitat must partition energy resources between foraging, keeping warm, successful pregnancy and pup-rearing, and healing and may experience reduced reproductive success. In addition, with wing damage, there may be an increased chance of WNS-affected bats being killed or harmed as a result of the proposed action. Again, this is particularly likely if timber harvest or burns are conducted early in the spring (April – May) when bats have just returned, have damaged wings, and are exposed to colder temperatures when torpor is used more frequently.

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

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

Rangewide Status

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

western portions of the range than in the northern portion of the range (Amelon and Burhans 2006).

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

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

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

Status of the Northern Long-eared Bat in Ohio

Prior to WNS, the NLEB was one of the most common species in Ohio and throughout the Midwest. Based on limited data there appears to have been a decline in summer populations as well as a decline at one hibernaculum. Biannual winter monitoring of Ohio's two largest bat hibernacula has documented a decline of wintering NLEB of approximately 91% (USFS 2014, ESI 2014). It does not appear that summer habitat has been a limiting factor for this species. However, due to the spread of WNS, the loss of forest cover and degradation of forested habitat may have an impact on the NLEB as populations are reduced or individuals are compromised.

Critical Habitat

Critical habitat has not been proposed for the NLEB.

Conservation Needs of the Species

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

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

ENVIRONMENTAL BASELINE

The Environmental Baseline analyzes the effects of past and ongoing human and natural factors leading to the current status of the species, their habitat, and the ecosystem within the action area. In order to assess the potential for the IBAT and NLEB to occur within the action area, the Service must formulate reasonable assumptions. These assumptions must be made in order to analyze the potential effects of the action. It is important to note that the Service has been mandated by Congress to provide the benefit-of-the-doubt to federally listed species (H.R.Conf. Report No. 697, 96th Cong., 2d Session, 1979). That is to say, the Service must err on the conservative side (the side of the species) when making reasoned assumptions.

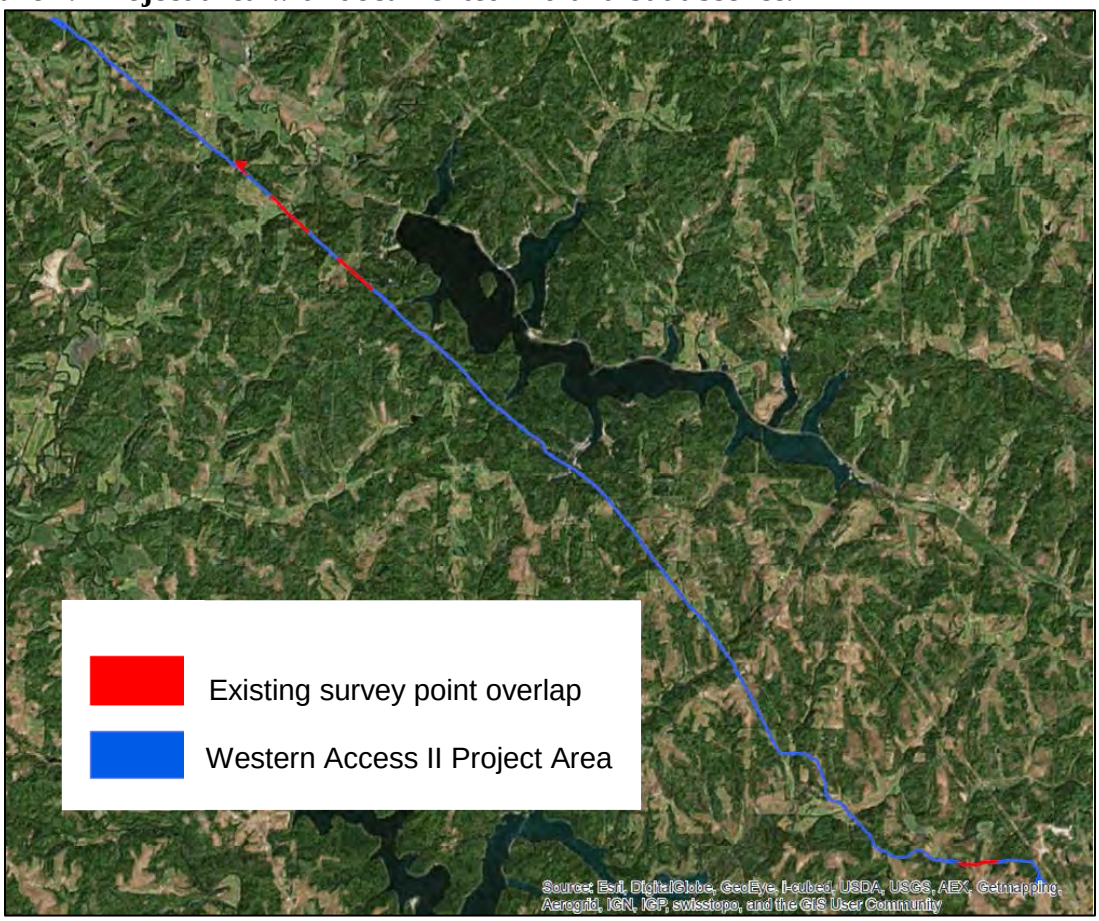
Status of the Indiana Bat in the Action Area

Summer Habitat
The entire State of Ohio is considered to be within the core maternity range of the IBAT. Therefore, the Service assumes that the IBAT may be present anywhere within Ohio during the summer where suitable habitat exists. Within the action area there have been 53 bat mist-net

survey sites for unrelated projects performed between 2010 and 2014. Of these sites, 5 were within 0.5 km of the project area and were performed in 2014 at the Service's currently accepted level of effort for presence/absence surveys for federally listed bats. Therefore, the 5 surveys performed in 2014 provide presence/absence coverage for the IBAT for a portion of the project area. No IBATs were captured during these five surveys. Therefore, IBAT absence is confirmed in these portions of the project area.

The documented absence area for IBATs includes approximately 14.8 wooded acres within the proposed clearing limits for the WAII Project. The 14.8 acres includes all of the proposed wooded area within the Plum Run Station and 3 additional ROW segments along the proposed pipeline route (Figure 2).

Figure 2. Project area with documented Indiana bat absence.



The total proposed tree clearing for the WAII Project is 92 acres. Of the 92 acres, IBAT summer absence has been confirmed on 14.8 acres. Therefore, the IBAT is presumed to be present during the summer on only 77.2 acres within the proposed clearing limits.

Approximately 6.8 percent of the 30,806-acre action area was surveyed for summer IBAT

presence/absence in 2014. No IBATs were captured during the 2014 summer surveys. However, the majority of the action area has not been surveyed for summer IBAT presence/absence. Therefore, IBATs are presumed to be present throughout the action area during the summer wherever suitable roosting and foraging habitat occurs except for within the 14.8 acres of the proposed project clearing limits where absence has been confirmed.

IBATs present during summer in the action area may include reproductively active females, non-reproductively active males and females, and juveniles. It is difficult to quantify the actual number of IBATs that may be present because IBATs are not uniformly dispersed on the landscape during the summer. For example, IBAT density would greater in areas where maternity colonies are present. The majority of the action area has not been surveyed for bats, although the previous IBAT summer surveys within the action area have failed to detect IBATs. It is also important to note that areas that have been surveyed may not necessarily represent the highest quality bat habitat available in the action area.

Assuming that IBATs are not evenly distributed through forested areas, and given the lack of previous captures within the action area and the surrounding landscape, it is reasonable to assume that the action area does not support a high density of IBATs throughout. Therefore, the Service estimates that no more than one (1) IBAT maternity colony occurs within the action area.

The average number of IBAT adults in a maternity colony is between 50 and 80 bats (Whitaker and Brack 2002). Therefore, we anticipate that 1 colony with up to 80 adult females each occurs in the action area. In addition, the action area likely supports some males and non-reproductive females during the summer.

Fall, Winter, and Spring Habitat
Due to the history of underground coal mining in eastern Ohio, it is possible that unknown portals to abandoned underground coal mines exist in the action area that may serve as fall swarming and/or winter hibernacula for IBATs. The project ROW was surveyed for mine portals and none were located though it is possible that there may be portals outside of the ROW that are within the action area. Therefore, the action area may contain suitable fall swarming and/or hibernation habitat for IBATs.

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

Summer Habitat
The entire State of Ohio is considered to be within the core maternity range of the NLEB. Therefore, the Service assumes that the NLEB may be present anywhere within Ohio during the summer where suitable habitat exists.

COFO places a three-mile buffer around all NLEB capture locations to delineate the potential roosting and foraging range for individual NLEBs. This three-mile buffer is based on the typical maximum distance a NLEB will travel between roost trees and foraging areas. The typical

maximum distance a NLEB will travel between roosts and foraging areas is one and a half miles (1.5 miles). None of the 158 NLEBs previously captured were radio-tracked. Therefore, no roost trees locations are known for the NLEB within the action area. Without data on roost tree locations, COFO assumes that the roost trees for these NLEBs could be within one and a half miles from the capture location and that the bats would forage up to one and a half miles in any direction of that roost location. Therefore, a buffer radius of three miles, which is double the typical maximum foraging distance, is placed around the capture points to incorporate both the roosting and foraging area for individual bats.

Within 3 miles of the project footprint, there have been 53 summer bat mist-net survey sites that captured a total of 158 NLEBs between 2011 and 2014. As a result, the entire project footprint and project action area is within three-mile capture buffers for NLEBs. Additionally, 98 of the NLEB captures occurred within the action area. Therefore, summer presence of the NLEB has been confirmed throughout the entire action area.

The 158 NLEB captures include 57 reproductively active females, 8 non-reproductively active adult females, 58 males, 31 juveniles, and 4 sex and age unknown. Reproductively active female NLEBs (pregnant, lactating, or post-lactating bats) and/or juvenile NLEBs were captured at 72% of the 53 survey sites. The presence of reproductively active females and/or juvenile bats at the majority of survey sites indicates the presence of NLEB maternity colonies throughout the action area. In addition, the action area supports male and non-reproductive females during the summer.

The exact number of individual NLEBs and colonies in the action area is unknown. We estimate that there are at least nine (9) colonies of NLEB in the action area based on the following calculations:

- There are approximately 30,806 acres in the action area
- Approximately 2/3 of the action area is forested (ODSA 2013): 30,806 x 0.67 = 20,640 acres of forested habitat available to the species
- 2.47 acres/ha; 20,640 acres/2.47 = 8,353 ha
- Average group size of NLEB = ~5 bats/group (Johnson et al. 2012)
- Average colony size of NLEB = ~60 (USFWS 2015b)
- 60 bats per colony/5 bats per group = 12 NLEB groups per colony
- Average colony home range size in Ohio is unknown; based on literature from Owen et al. (2003), Carter and Feldhammer (2005), Broders et al. (2006), and Lacki et al. (2009), the average home range for a colony of NLEB ranges from as low as 17.7 ha to as high as 186.3 ha. To determine an estimated colony home range of an individual group in the action area, we averaged the ranges in the references above and calculated it to be approximately 83 ha/group
- 12 groups x 83 ha = 996 ha average colony home range

- 8,353 ha/996 ha = ~9 colonies

Fall, Winter, and Spring Habitat
Due to the history of underground coal mining in eastern Ohio, it is possible that unknown portals to abandoned underground coal mines exist in the action area that may serve as fall swarming and/or winter hibernacula for NLEBs. The project ROW was surveyed for mine portals and none were located though it is possible that there may be portals outside of the ROW that are within the action area. Therefore, the action area may contain suitable fall swarming and/or hibernation habitat for NLEBs.

Conservation Needs in the Action Area

The conservation needs of the IBAT and NLEB in the action area are similar to their needs rangewide. The action area provides habitat for summering and migrating IBATs and NLEBs and may also contain unknown suitable fall swarming and hibernation habitat. Therefore, within the action area the conservation needs include providing suitable habitat conditions for IBAT and NLEB roosting, foraging, and traveling.

Habitat Conditions in the Action Area

The 30,806-acre action area is dominated by rural communities, woodland, and small agricultural farms. ODSA (2013) reports that approximately two-thirds of Tuscarawas and Harrison Counties are forested. The majority of the action area is composed of developed open space and mixed-oak forest typical of general character in the counties (Table 1). Therefore, it is estimated that there are approximately 20,640 forested acres within the action area (two-thirds of 30,806 acres).

Table 1. Forest Composition in the Project Area

Tree Species	**Scientific Name**	***Approximate Percent Cover**
Red Oak	*Quercus rubra*	12.5
White Oak	*Quercus alba*	11.5
Black Cherry	*Prunus serotina*	9.5
Sugar Maple	*Acer saccharum*	9.5
Red Maple	*Acer rubrum*	7.5
Silver Maple	*Acer saccharinum*	6.5
Green Ash	*Fraxinus pennsylvanica*	6.5
Shagbark Hickory	*Carya ovata*	6.0
Tuliptree	*Liriodendron tulipifera*	6.0
American Elm	*Ulmus americana*	4.5
Cottonwood	*Populus deltoides*	4.0

Sassafras	*Sassafras albidum*	3.0
White Ash	*Fraxinus americana*	3.0
White Pine	*Pinus strobus*	2.1
Sycamore	*Platanus occidentalis*	1.5
Pin Oak	*Quercus palustris*	1.3
Black Locust	*Robinia psuedoacacia*	1.3
Ironwood	*Ostrya virginiana*	1.0
Hornbeam	*Carpinus caroliniana*	1.0
Beech	*Fagus grandifolia*	0.3
Blackgum	*Nyssa sylvatica*	0.3
Black Willow	*Salix nigra*	0.3
Black Walnut	*Juglans nigra*	0.3
Flowering Dogwood	*Cornus florida*	0.3
Japanese Silverberry	*Eleagnus umbellatus*	0.2
Buckeye	*Aesculus glabra*	0.2
Bigtooth Aspen	*Populus grandidentata*	0.1

* Percent composition within the project area was derived from wetland delineation data sheets and general project field notes.

The proposed project footprint area consists of approximately 249.9 acres of mixed land use typical of Tuscarawas and Harrison Counties (Table 2). None of the forest in the footprint can be considered "virgin" or "old growth" forest. Although some larger trees are present along fence-rows, the large majority of trees are smaller with diameters ranging from 2 to 24 inches dbh. None of the forested areas have a dominance of larger trees and onsite forested areas do not have a high species diversity among canopy trees. Therefore, it is likely that most or all of the forest in the study area has been disturbed during the past century.

Table 2. Land Uses in the Impact Area

Resource Type	**Size***	**Percent of Area***
Upland Forest - UF - (uplands dominated by trees)	107.4 ac.	43%
Developed Open Space - DS - (mown right-of-way, large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes)	136.5 ac.	55%
Forested Wetland - As defined by the USACE 1987 Manual	0.1 ac.	<1%
Non-Forested Wetland - As defined by the USACE 1987 Manual	5.9 ac.	<1%
Stream - As defined by the USEPA, OEPA, and USACE	15,335 l.f	NA

Resource Type	Size*	Percent of Area*

* Forested acreage within the project area was determined via tree clearing estimates and December 2013 aerials. Wetland and stream acreages were derived from wetland delineation results.

Potential bat roost trees > 5 inches dbh were identified from July 2014 through December 2014 by EnviroScience, Inc. Living or dead trees with shedding or peeling bark or cavities higher than 15 feet from the ground and with dbh measurements larger than 5 inches were considered potential roost trees (PRTs) by EnviroScience, Inc. Three hundred and four (304) PRTs were identified within the preliminary project area. These PRTs were northern white oak, northern red oak, shagbark hickory, black cherry, American basswood, black locust, black walnut, red maple, American elm, tuliptree, sugar maple, white pine, and standing dead trees with dbh measurements ranging from 5 to 52 inches. The identified PRTs had 10 to 100% solar exposure. Approximately 200 PRTs were located within the impact area and were cleared between October 1, 2014 and March 31, 2015. The remaining 104 identified PRTs are not located within the clearing footprint and are not proposed to be removed.

It is possible that not all PRTs were identified within the project clearing footprint and previously removed. There may be additional PRTs that will need to be cleared including trees that are ≤5 inches dbh, trees with roosting characteristics within 15 feet of the ground, trees that were not identified or overlooked as PRT, and/or trees may have become suitable since the survey and PRT clearing was performed.

EFFECTS OF THE ACTION

This BO evaluates the anticipated effects of the WAII Project on the IBAT and NLEB. This project will require removal of 92 acres of potential IBAT and NLEB habitat in addition to the removal of 16.4 forested acres and 200 PRT that has already occurred. Potential effects to the IBAT and NLEB include direct and indirect effects. Direct effects occur when bats are present while the activities are being conducted; indirect effects occur later in time. Effects will vary based on the type of the proposed activity.

Our analysis of effects for the IBAT and NLEB entails: (1) evaluating individual IBAT and NLEB exposure to action-related stressors and response to that exposure; (2) integrating those individual effects (exposure risk and subsequent response) to discern the consequences to the populations to which those individuals belong; and (3) determining the consequences of any population-level effects to the species rangewide. If, at any point, we demonstrate that the effects are unlikely, we conclude that the agency has insured that their action is not likely to jeopardize the continued existence of the species and our analysis is completed.

Direct and Indirect Effects

Effects to IBATs and NLEBs During Fall and Winter

There are no known hibernacula within the project action area. EOG has stated that there are no cave or coal mine portals within the project's temporary and permanent clearing limits. However, it is possible that there may be unknown mine portals within the action area due to previous underground coal mining activities. It is also possible that IBATs and NLEBs are present in the action area in the fall engaging in swarming activity around these portals.

Project activities which could affect swarming and hibernating bats include noise and ground vibrations during project construction from operating heavy equipment and blasting. Rock and/or substrate blasting in the ROW will be utilized to facilitate pipeline installation. EOG anticipates that blasting will only occur after August 1, 2015 following clearing and grading of the ROW. EOG estimates that installation of the pipeline may take up to 90 days to complete. Therefore, the anticipated timeframe for blasting to occur during pipeline installation is from early August to November.

In Ohio, IBATs and NLEBs may engage in fall swarming in August until November and enter hibernation as early as mid-September and remain in hibernation until late March or early April (Caceres and Barclay 2000, USFWS 2007). Ground vibrations from heavy equipment operation and blasting that occurs during the swarming and hibernation period could affect bats if these activities are conducted in close proximity to any unknown underground abandoned mines. Vibrations from equipment and blasting could harass bats present in the action area during fall swarming. Substrate born vibrations from equipment and blasting could affect hibernating bats in a couple ways: (1) blasting near the mine could cause the mine to collapse which would kill or trap hibernating bats, and (2) vibrations generated from equipment and blasting could cause bats to awaken during hibernation thus decreasing their fitness by causing them to deplete their limited fat reserves prematurely.

Equipment and blasting activities would be restricted to the daytime. Therefore, vibrations and noise is not likely to occur when bats area actively engaging in swarming activity. Several studies have been undertaken to assess the effect of noise on hibernating IBATs. Data from these studies indicate that when hibernating, IBATs are not particularly sensitive to air and substrate-born vibrations (ESI 2004). Therefore, it is possible that noise vibrations that do not threaten the structural integrity of mines may not pose a detectable response from hibernating IBATs. It is assumed that NLEB sensitivity to noise vibrations would be similar to that of IBATs.

There are no portals located within the project ROW. Thus, it is unlikely that there is an unknown underground mine directly below or directly adjacent to the project ROW. It is probable that noise vibrations from construction activities would either not reach unknown mines outside the ROW, or if they did, the levels would not cause bats day roosting in and around mines and hibernating bats to awaken. Therefore, no adverse effects to swarming and

hibernating IBATs and NLEBs are anticipated and any effects to bats in the fall and winter are expected to be insignificant or discountable.

Effects to IBATs and NLEBs during Summer

The linear portion of the project will temporarily disturb approximately 234.6 acres of land. An area of approximately 178.9 acres will be maintained, by mowing and brush-hogging, for the permanent ROW easement. Three M&R stations will be constructed along the ROW. Holmes Station is located at the northern terminus of the project area and totals 4.5 acres. The central station, Plum Run Station, is located approximately 3,445 feet northwest of Plum Run Road and totals 4.4 acres. The Cadiz West Station is located at the southern terminus of the project area and totals 6.4 acres. The clearing associated with each M&R station will be permanently maintained.

The project will require the clearing of 86.1 acres of forested habitat for the linear portion of the project. Approximately 16.4 acres of forest along the ROW and 200 PRT within the project area were previously cleared between October 1, 2014 and March 31, 2015. The M&R stations require 5.9 acres of tree clearing. All tree clearing along the ROW and for the Holmes Station will occur prior to October 1, 2015. Clearing for the Plum Run Road station (1.5 forested acres) and Cadiz West station (0.5 forested acres) will occur between October 1, 2015 and March 31, 2016. A total of 92 acres of additional tree clearing will be necessary to complete the project with 90 of the acres to be cleared during the summer IBAT and NLEB roosting and foraging period.

Indiana Bats – Roost Trees
Loss of roost trees can have substantial implications for reproductive females. As explained previously in Status of Species section, female and young IBATs depend on specific roost trees for their reproductive success and survival. If their primary maternity roost tree (MRT) or several secondary roost trees are removed, the exposed individuals will need to search for new roosting sites. This can lead to increased energy expenditure, torpor, and possibly loss of young if the expenditure is sufficiently severe and prolonged. Individual males can also be impacted by loss of an undetected roost tree if cut while occupying the tree.

We do not anticipate direct impacts due to loss of occupied IBAT primary MRTs due to the previous clearing of PRT. IBAT primary MRTs are readily identifiable due to their large size, typically ≥16 inches dbh, and structure, which contains large areas of peeling or exfoliating bark with significant solar exposure. It is unlikely that a primary MRT would have been overlooked during the site evaluation and clearing of PRTs. Indirect impacts could have occurred previously if a primary MRT was cut in the winter. If an primary MRT was previously cut, we fully expect that the colony would have been able to readily locate a new MRT due to the forested character of the landscape.

Direct impacts to roosting IBATs will occur only if an undetected secondary or a less important roost was not previously identified and removed and is cut while occupied by individuals.

Removal of trees between April 1 and September 31 has the potential to directly impact individual bats. Due to the less specific requirement for non-maternity roost trees it is expected that there are sufficient numbers of these trees on the landscape and it should be feasible for an IBAT to locate alternate roost sites.

Removal of an unidentified PRT during the summer could result in crushing or injury of adult or volant juvenile IBATs. The likelihood of this has been minimized by the previous identification of PRT and winter clearing. Due to the size of the project area (92 forested acres remaining), it is possible that not all PRT were identified and previously removed or that some trees may have become suitable for roosting following the previous removal activities. Tree removal actions during the summer should typically result in sufficient disturbance to arouse IBATs cause them to leave the roost if an occupied PRT is removed during the summer. IBATs that do not leave the tree could be killed or injured as the tree is dropped.

Northern Long-eared Bats – Roost Trees

As indicated above, the probability of any tree removal impacting potential MRT trees during the summer is low. When evaluating the project area, EOG consultants likely identified and conducted winter removal of most potential MRT for NLEB. However, primary MRTs for NLEBs may not be as easily identified as they are for IBATs. NLEBs are more likely to use live trees, trees with cavities, and shorter trees, and roost lower in trees than IBATs (Timpone *et al*. 2010). Also, NLEB do not necessarily require MRTs to have significant solar exposure (Timpone *et al*. 2010, Sasse and Pekins 1996, Lacki and Schwierjohann 2001).

If a potential MRT was not previously identified and removed, it would most likely be a smaller tree that would be more conducive to habitat for smaller groups of NLEBs, such as those formed by post-lactating NLEBs. NLEB maternity colonies disperse soon after the young become volant. Thus, removal of a small unidentified roost tree could result in take of a relatively small number of bats. Removal of an unidentified maternity roost tree between April 1 and September 31 could result in take of individual NLEBs. It would be expected that most adult NLEBs could arouse and flee if their MRT was impacted by removal. However, non-volant young may be injured or killed.

If an unidentified MRT is removed in June or July when NLEBs are pregnant or lactating, this could impact colonies when they have the highest number of bats. During this period, any young present would most likely be non-volant. Non-volant bats would be most susceptible to death and injury as they would be unable to fly away from the tree before is felled. Most adult bats are expected to arouse and can fly to other suitable roost trees. It is expected that most adult females would be able to retrieve young. Approximately half of the proposed tree clearing for the WAII Project will occur after July when IBAT and NLEB pups have become volent, thus, minimizing impacts to non-volent bats during tree felling.

NLEB non-maternity roost trees can be smaller than those used by IBATs. NLEBs will utilize small cracks and cavities in trees with a dbh as small as 3 inches. The roosting features may also

be within a few feet of the ground (Stantec 2013, Schultes 2002). Since NLEBs can use small trees as well as small crevices within trees including healthy trees, it is unlikely that every potential NLEB roost tree was previously identified and removed.

Removal of trees April 1 through September 31 has the potential to directly impact individual IBATs. Due to due to the forested character of the landscape, it is expected that there are sufficient numbers of these trees on the landscape and it should be feasible for a NLEB to locate an alternate roost site. NLEBs frequently switch roost trees and it is expected that they utilize multiple roost trees during the summer season.

IBAT and NLEB – foraging

The forested habitat within the project footprint and within the action area provides suitable foraging habitat for IBATs and NLEBs. Both species forage within and around the canopy of upland forests and occasionally forage over forest clearings, water, and along roads. The preferred foraging habitat for IBATs is more typically associated with riparian areas while NLEB foraging typically occurs on forested hillsides and ridges rather than along riparian areas (Brack and Whitaker 2001, LaVal *et al*. 1977).

The loss of foraging habitat when bats are present could directly affect the IBAT and NLEB by disrupting bat foraging patterns within the action area. During tree clearing, some individual bats may avoid crossing the project footprint. Bats in this scenario would be subject to take in the form of harassment as they are displaced from their home range. Due to the availability of suitable foraging opportunities in the surrounding landscape, it is likely that these bats will have little difficulty in establishing new home ranges. Bats that remain loyal to certain foraging areas may continue to cross through newly cleared areas in the project footprint and would likely have an increased risk of mortality from predation although this risk is not detectable or measurable. Due to the linear nature of the project, individual bat foraging areas are not likely to be significantly altered and indirect adverse effects to individual bats are not anticipated.

To help offset habitat losses from the WAII Project, EOG is seeking mitigation near the project area to re-forest approximately 200 acres of abandoned strip mine land to provide roosting and foraging habitat for bats. EOG intends to enter into an agreement with the Muskingum Watershed Conservancy District to develop a mitigation plan to remove invasive autumn olive from the 200-acre site and replant the site with a mix of hardwood saplings. Restoration of the site is anticipated to provide future roosting and foraging habitat for IBATs and NLEBs.

Effects from Noise and Disturbance

Noise and vibration and general human disturbance are stressors that may disrupt normal feeding, sheltering, and breeding activities of the IBAT and NLEB. Bats may be exposed to noise, vibrations, and disturbance from tree clearing, equipment operation, and blasting in and near their roosting and foraging areas.

There is limited literature available regarding impacts from noise (outside of road/traffic) on bats. Gardner et al. (1991) had evidence that an IBAT, continued to roost and forage in an area with active timber harvest. Callahan (1993) noted that the likely cause of the bats in his study area abandoning a primary roost tree was disturbance from a bulldozer clearing brush adjacent to the tree. Therefore, novel noises would be expected to result in some changes to bat behaviors.

Increased noise created by construction equipment within the project area could disturb bats day roosting in nearby forests during spring, summer, and fall. This potential disturbance would be localized and short-term for the project. The novelty of these noises and their relative volume levels will likely dictate the range of responses from individuals or colonies of bats. At low noise levels (or farther distances), bats initially may be startled and have increased respiration/heart rates, but they would likely habituate to the low background noise levels. At closer range and louder noise levels (particularly if accompanied by physical vibrations from heavy machinery and crashing of falling trees), many bats would probably be startled to the point of fleeing from their day-time roosts and in a few cases may experience increased predation risk. Because the noise levels in construction areas will continue for more than a single day, the bats roosting within or close to these areas are likely to shift their focal roosting areas farther away or may temporarily abandon these roosting areas completely. Gardner et al. (1991) suggested that noise and exhaust emissions from machinery could possibly disturb colonies of roosting bats, but such disturbances would have to be severe to cause roost abandonment. Callahan (1993) noted that the likely cause of the bats in his study area abandoning a primary roost tree was disturbance from a bulldozer clearing brush adjacent to the tree.

Effects from Lighting

Lighting may be used during project construction during dawn and dusk later in the year when daylight hours become limited. Bat behavior may be affected by lights when traveling between roosting and foraging areas. Foraging in lighted areas may increase risk of predation (leading to death) or it may deter bats from flying in those areas. Bats that significantly alter their foraging patterns may increase their energy expenditures resulting in reduced reproductive rates. This depends on the context (e.g., duration, location, extent, type) of the lighting.

While there is limited information regarding potential neutral, positive, or negative impacts to NLEB from increased light levels, slow-flying bats such as *Rhinolophus, Myotis, and Plecotus* species have echolocation and wing-morphology adapted for cluttered environments (Norberg and Rayner 1987), and emerge from roosts relatively late when light levels are low, probably to avoid predation by diurnal birds of prey (Jones and Rydell 1994). Therefore, we would generally expect that NLEB would avoid lit areas. In Indiana, IBATs avoided foraging in urban areas and Sparks et al. (2005) suggested that it may have been in part due to high light levels.

Lighting for the WAII Project will be limited to dusk and dawn during the fall when daylight hours are reduced. Lighting would be an additional disturbance occurring at the same time as

construction noise and vibrations. By fall, the ongoing construction disturbances will likely have already resulted in bats shifting their roosting and foraging usage of the action area. Furthermore, in mid-September when lighting may begin being utilized, bat usage of the action area will likely be reduced as bats migrate and engage in fall swarming. Therefore, lighting effects on bats are anticipated to be insignificant and discountable.

Effects from Stream and Wetland Impacts

Earthwork and general construction activities may result in short-term adverse impacts to the water quality in the action area. Installation of the pipeline will result in temporary impacts to 3.657 acres of Category 1 and 2 wetlands, 59.5 linear feet of perennial stream, 81.5 linear feet of intermittent stream, and 39 linear feet of ephemeral stream. Construction of the Holmes Station will result in additional temporary impacts to 95 linear feet of intermittent stream and 200 linear feet of ephemeral stream. Sediment, herbicides, and other contaminants could affect water quality through erosion, vegetation management, and accidental spills during any phase of the project from construction to operation. These impacts will primarily be localized (i.e., limited to the construction limit footprint), but may extend for some distance downstream, depending on intensity of disturbance and field conditions at the time of construction.

Insects associated with these aquatic habitats make up a portion of the diet of the IBAT and NLEB. A change in water quality can affect the species base of these prey species. Decreases in water quality through contamination and the temporary disturbance of wetlands and stream habitats while bats are present may reduce the availability of aquatic insects and may reduce the availability or quality of suitable drinking sources. However, all wetland and stream impacts along the linear portion of the project will be temporary as wetlands and streams within the linear portion of the project will be restored to original grade.

EOG will follow federal wetland permitting, stormwater management, and water quality standards. Implementation of the standard best management practices (e.g., minimization of wetland fill, implementation of erosion control measures) and narrowing of the project corridor from 115’ to 50’ through wetlands and streams is expected to provide for continued clean water and aquatic foraging habitat for bats.

Even if there are minor water quality changes that cause a temporary, localized reduction in prey base and drinking resources for the bats, we presume that the surrounding landscape will continue to provide an abundant prey base of both terrestrial and aquatic insects during project construction, operation, and maintenance. Therefore, any potential direct and indirect effects to the bats from a reduction in water quality are anticipated to be insignificant.

Effects from Spills

Accidents during project operation could result in the leakage of hazardous chemicals into the environment which could affect water quality resulting in reduced densities of aquatic insects that bats consume. If an accident occurred and hazardous chemicals leaked into the environment, a rapid response from state and/or federal agencies would limit the size of the spill area. However, if chemicals did reach surface waters (streams and wetlands), a short-term reduction in both aquatic and terrestrial insects could occur, thus reducing the spring, summer, or autumn prey base for foraging IBATs and NLEBs. If this occurred, it would be localized, thus allowing foraging bats to move nearby and continue foraging. Therefore, direct and indirect effects to bats of a possible accident involving leakage of hazardous chemical are unlikely to occur.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. This section analyzes the added impact from cumulative effects.

The Service is unaware of any tribal, state, local, or private actions presently occurring or that are reasonably certain to occur in the future, which would destroy, modify or curtail the IBAT and NLEB summer habitat within the action area. Therefore we do not anticipate significant cumulative effects from the proposed action, combined with other reasonably foreseeable non-federal actions.

Summary of Effects

Impacts to Individuals

Potential effects of the action include direct effects to IBAT and NLEB present within the action area when activities are being conducted, and indirect effects as a result of changes in habitat suitability. Direct effects to individual bats include mortality, injury, harm, or harassment as a result of removal roost trees and foraging habitat between the bats' summer maternity period from April 1 to September 30. The potential for direct effects is greatest between June 1 and July 31 when non-volent pups could be injured or killed as they would be unable to fly away from a roost tree before is felled. Approximately half of the tree clearing will be conducted after July 31 which will reduce the potential for injury/death of non-volent pups. Furthermore, approximately 200 PRTs > 5 inches dbh have already been identified and previously clearing between October 1 and March 31, further reducing the potential for injury/death of non-volent pups. Disturbance from the tree clearing and construction activities may also harass bats and

cause them to alter their roosting and foraging activities.

Indirect effects from the action may result from habitat modification and primarily involve changes to roosting and foraging suitability. Given the linear nature of the projects in relation to the overall forested character of the action area, this project will not substantially alter the overall availability or suitability of IBAT and NLEB roosting or foraging habitat. Therefore, indirect effects are likely to be insignificant and discountable.

Impacts to Populations

As we have concluded that individual bats are likely to experience mortality, injury, harm, or harassment, we need to assess the aggregated consequences of the anticipated reductions in fitness (i.e., reproductive success and survival), of the exposed individuals on the populations (maternity colonies) to which these individuals belong. We recognize the potential for a small amount of injury or lethal take of adults and/or pups, but we believe the IBAT and NLEB colonies affected should be able to sustain the worst-case losses discussed above.

Impacts to the Species

Reductions in the maternity colonies' population fitness are unlikely to occur. Thus, no component of the proposed action is expected to reduce the reproduction, numbers, or distribution of the IBAT and NLEB rangewide. While we recognize that the status of the species is uncertain due to WNS, given the environmental baseline, and the intensity, frequency, and duration of the project impacts, we find that the proposed project is unlikely to have population-level impacts, and thus, is also unlikely to decrease the overall reproduction, numbers, or distribution of the IBAT and NLEB. Therefore, we do not anticipate a reduction in the likelihood of both survival and recovery of these species as a whole.

NLEB Interim 4(d) Rule Excepted Activities

Approximately 81.2 acres of bat habitat, 88 percent of the tree clearing for the project, will occur within 100 feet adjacent to existing ROWs and any take of NLEB associated with the expansion is excepted by the Service's NLEB interim 4(d) rule when following certain conservation measures. According to the interim 4(d) rule, the Service projected that activities associated with ROW expansions will impact only a small percentage of NLEB habitat and result in low levels of take of individuals. The Service concluded that take of the NLEB excepted by the interim rule will be small and will not pose a significant impact on the conservation of the species as a whole.

Though currently there are no known occupied NLEB roost trees and hibernacula within 0.25 miles of the project ROW, implementation of the interim 4(d) rule conservation measures should further reduce the take of those individual bats if roost trees become known. When occupied roosts are cut during the active season (outside of the pup season) or if undocumented NLEB roosts are cut while occupied, some portion of these individuals will flee the roost and survive.

The conservation measures will further protect NLEB hibernacula, should any become known, including a portion of the surrounding habitat. Thus, the Service, in the interim 4(d) rule, anticipated only a small percentage (estimated less than 1 percent) of NLEB will be directly impacted by ROW expansion activities each year.

IBAT and NLEB (Non-4(d) Rule Excepted Activities)

Approximately 10.8 acres of bat habitat, 12 percent of the 92 habitat acres, will occur outside of existing ROWs and any take of NLEB associated with construction of new ROW and the M&R stations is not excepted by the interim 4(d) rule. Of the 92 habitat acres, IBAT summer absence has been confirmed on 14.8 acres. Therefore, the IBAT is presumed to be present during the summer on only 77.2 acres within the proposed clearing limits.

Based on the analysis above, despite the anticipated adverse effects to IBAT from removal of 77.2 forested acres and NLEB from the removal of 10.8 non-4(d) rule excepted acres, the proposed action should not decrease the reproduction, numbers, or distribution of the IBAT and NLEB in a way or to the extent that would cause an appreciable reduction in the likelihood of both survival and recovery of the species as a whole.

CONCLUSION

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

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is

not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

On April 2, 2015, the Service published an interim species-specific rule pursuant to section 4(d) of the ESA for NLEB (80 FR 17974). The Service's interim 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, when such take occurs as follows (see the interim rule for more information):

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

The incidental take that is carried out in compliance with the interim 4(d) rule does not require exemption in this Incidental Take Statement. Accordingly, there are no reasonable and prudent measures or terms and conditions that are necessary and appropriate for these actions because all incidental take has already been exempted. The activities that are covered by the NLEB interim 4(d) total 81.2 acres and are as follows: 1) 74.3 acres of tree clearing along the existing EOG TPL 2 and TPL 3 ROWs, and 2) 6.9 acres of tree clearing along non-EOG ROWs. The remainder of this analysis addresses incidental take of IBATs and the incidental take of the NLEB resulting from those elements of the proposed action that are not covered by the NLEB 4(d) rule.

AMOUNT OR EXTENT OF TAKE

Incidental take of IBAT and NLEB present in the action area could occur due to tree clearing and noise disturbance during clearing and construction. The Service anticipates incidental take of the IBAT and NLEB will be difficult to detect for the following reasons: (1) the individuals are small and occupy summer habitats where they are difficult to find; (2) Both species form widely dispersed maternity colonies under loose bark or in the cavities of trees, and males and non-reproductive females may roost individually which makes finding the species or occupied habitats difficult; (3) finding dead or injured specimens during or following project implementation is unlikely; (4) the extent and density of the species within its summer habitat in

the action area is unknown; and (5) in many cases incidental take will be non-lethal and undetectable.

The Service anticipates that no more than 20,640 acres of habitat occupied by 1 IBAT maternity colony, 9 NLEB maternity colonies, and individual male and non-reproductive IBATs and NLEBs will be disturbed and 92 acres of habitat cleared as a result of WAII project project. Of the habitat to be cleared, IBAT is assumed to be present on 77.2 acres. NLEB is known to be present on the entire 92 acres to be cleared. Incidental take of NLEB on 81.2 of the 92 acres is exempted by the interim 4(d) rule.

We anticipate that some male, female, and juvenile IBATs and NLEBs may be killed or injured during clearing that occurs during construction of the WAII Project in the active season from April 1 to September 30. This is likely to occur if an occupied roost tree is felled during the summer roosting/foraging. We anticipate that clearing during the active season will result in take in the form of death, harm, or harassment of no more than 2 IBATs on 77.2 acres where IBAT presence is assumed and 10 NLEBs on 10.8 acres where NLEB presence is confirmed and incidental take of NLEB is not exempted by the interim 4(d) rule.

Monitoring to determine actual take of individual bats within an expansive area of forested habitat is a complex and arduous task. Inspecting individual trees is not considered by the Service to be a practical survey method and is not recommended as a means to determine incidental take. However, the potential roosting and foraging habitat affected can be used as a surrogate to monitor the level of take. Therefore, the Corps must reinitiate consultation with the Service if more than 92 acres of forested habitat are removed during the project.

EFFECT OF THE TAKE

Overall, the death or injury of 2 IBATs, death or injury of 10 NLEBs, harm and harassment of one 1 IBAT maternity colony, 9 NLEB maternity colonies, and individual male and non-reproductive IBATs and NLEBs, is not likely to cause population-level effects. In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to IBAT and NLEB. No critical habitat for the IBAT occurs in the action area and none has been designated for NLEB, so none would be impacted.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the impacts of incidental take of IBATs and NLEBs during the construction of the WAII project.

1. The Corps will ensure the permittee will monitor take to verify that the authorized level of take has not been exceeded within their permit areas during construction of the project. EOG

must comply with this RPM in areas outside of the Corps' permit areas.

2. Implementation of all conservation measures proposed by EOG in the BA.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the Corps and EOG must comply with the following terms and conditions, which implement the reasonable and prudent measures. These terms and conditions are non-discretionary.

1. EOG will monitor tree clearing limits to ensure no more than 92 acres of trees are cleared for the project (86.1 acres of forested habitat for the linear gas pipeline portion and 5.9 acres for the M&R stations).

2. Take by injury and mortality during project construction when trees are being cleared from the construction ROW and M&R stations will be monitored. This will include ensuring that all contractors and others present during clearing activity are fully informed of the potential to encounter dead or injured bats and of EOG's responsibilities if dead or injured bats are encountered. Individuals present during clearing activities will be diligent in their efforts to locate dead or injured bats. If dead or injured bats are encountered, the number and location will be reported through the chain of command to EOG. The procedures in #2 below will also be followed. In addition to encountering dead or injured bats, those present on the project area during clearing activities will be diligent and aware of other factors that might indicate bat presence such as watching for bats flying away from areas where trees are cleared. These data will be reported to the Service as described in #2 below.

3. If a dead or impaired IBAT or NLEB is found, care should be taken in its handling to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen in not unnecessarily disturbed. The dead or impaired bat should be photographed prior to disturbing it or the site. The Service is to be notified 24 hours upon locating a dead or injured IBAT or NLEB. Initial notification must be made to the nearest U.S. Fish and Wildlife Service Office of Law Enforcement, at (740) 369-0495, then the Columbus Ohio Ecological Services Field Office at (614) 416-8993. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information, including age, sex, and reproductive conditions of the individual(s). Formal written notice must also be submitted.

3. The Corps will include implementation of the conservation measures, as detailed in the BA, as a special condition of the NWP authorization. In addition to permit conditions, EOG is responsible for complying with all proposed conservation measures in areas outside of the Corps' permit areas.

The RPMs, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service believes that the action will result in the following:

1. Disturbance of 20,640 acres of habitat occupied by IBATs and NLEBs
2. Removal of 77.2 acres of habitat occupied by IBATs
3. Removal of 10.8 acres of habitat occupied by NLEBs where the interim 4(d) rule does not exempt incidental take
4. Death or injury of no more than two (2) IBATs on the 77.2 acres of habitat occupied by IBATs
5. Death or injury of no more than 10 NLEBs on the 10.8 acres of habitat occupied by NLEBs where the interim 4(d) rule does not exempt incidental take

CONSERVATION RECOMMENDATIONS

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

The Service has identified the following actions that, if undertaken by the Corps or EOG, would further the conservation of the IBAT and NLEB.

1. The Corps should seek opportunities to provide for bat education and outreach for staff and applicants.

2. EOG should seek opportunities to provide replacement trees to properties in areas cleared for temporary construction activities.

3. EOG should seek opportunities to provide for bat education and outreach for staff, contractors, and landowners.

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

REINITIATION NOTICE

This concludes formal consultation for the Corps' actions outlined in your request dated June 25, 2015. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is

authorized by law) and if: (1) the amount or extent of incidental take is exceeded (more than 92 acres of forested habitat is removed; and/or more than 2 IBATs are injured or killed; and/or more than 10 NLEBs are injured or killed); (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

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