Biological Opinion and Incidental Take Statement for the Northern Long-eared Bat (*Myotis septentrionalis*) for the On-Site Waste Disposal Facility at Portsmouth Gaseous Diffusion Plant in Piketon, Pike County, Ohio.

November 5, 2015

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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. Department of Energy (DOE) proposed On-Site Waste Disposal Facility (OSWDF) and the effects on the 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.*). DOE's request for formal consultation was received on September 28, 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).

CONSULTATION HISTORY

DOE determined that the OSWDF Project is likely to adversely affect the NLEB and submitted a request for initiation of formal consultation to the Service on September 28, 2015. In a September 28, 2015 response letter, the Service concurred with DOE's 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 September 28, 2015.

Date	**Event**
August 16, 2012	DOE sends COFO a letter requesting technical assistance regarding their proposed Remedial Investigation/Feasibility Study for remediation activities being proposed at PORTS
September 10, 2012	COFO sends technical assistance letter to DOE in response to 8/16/2012 request
April 4, 2013	DOE sends letter to COFO requesting technical assistance regarding their completed Remedial Investigation/Feasibility Study for remediation activities being proposed at PORTS
April 17, 2013	COFO sends letter to DOE providing technical assistance regarding the proposed option to construct an Onsite Disposal Cell at PORTS
April 22, 2013	DOE emails information on the project scope of work for proposed construction of a clay liner test pad
April 22, 2013	COFO sends a technical assistance letter to DOE regarding proposed tree clearing to construct a clay liner test pad to collect data for inclusion in the Remedial Investigation/Feasibility Study for remediation activities being

	proposed at PORTS under CERCLA.
April 25, 2013	DOE emails COFO requesting discussion of April 22, 2013 technical assistance letter
July 1, 2013	DOE emails bat mist net study plan to COFO
July 2, 2013	Stantec submits bat survey proposal and requests authorization to conduct bat mist net survey at PORTS
July 2, 2013	COFO emails written authorization to proceed with survey to Stantec
July 19, 2013	COFO email notification to DOE regarding upcoming proposal to list NLEB as endangered and request for NLEB data
July 19, 2013	DOE email to COFO with NLEB data for ongoing summer bat survey at PORTS
January 7, 2014	COFO emails NLEB Conference Guidance to DOE
September 23, 2014	DOE and COFO meet at COFO to discuss project
September 10, 2015	DOE emails COFO a draft BA
September 16, 2015	DOE and COFO discuss ESA section 7 consultation process as it relates to a CERCLA site remediation
September 17, 2015	DOE emails COFO information on CERCLA remediation and ESA section 7 compliance
September 18, 2015	COFO emails comments on draft BA to DOE and provides information on ESA section 7(d) obligations
September 28, 2015	DOE submits letter and initiation package requesting initiation of formal consultation
September 28, 2015	COFO sends letter to DOE acknowledging receipt of complete initiation package. Formal consultation initiated September 28, 2015
October 27, 2015	COFO sends draft BO to DOE for review
November 3, 2015	DOEs sends comments on draft BO to COFO
November 5, 2015	COFO issues final BO to DOE concluding formal consultation

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The federal action evaluated in this biological opinion (BO) is the construction of the On-Site Waste Disposal Facility (OSWDF) at the Portsmouth Gaseous Diffusion Plant (PORTS) by the DOE. Construction of the disposal facility will require clearing of 215 forested acres for site preparation and construction of support facilities.

The Service is issuing this BO pursuant to section 7 of the ESA. Direct and indirect effects of the federal action (construction of the OSWDF) 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).

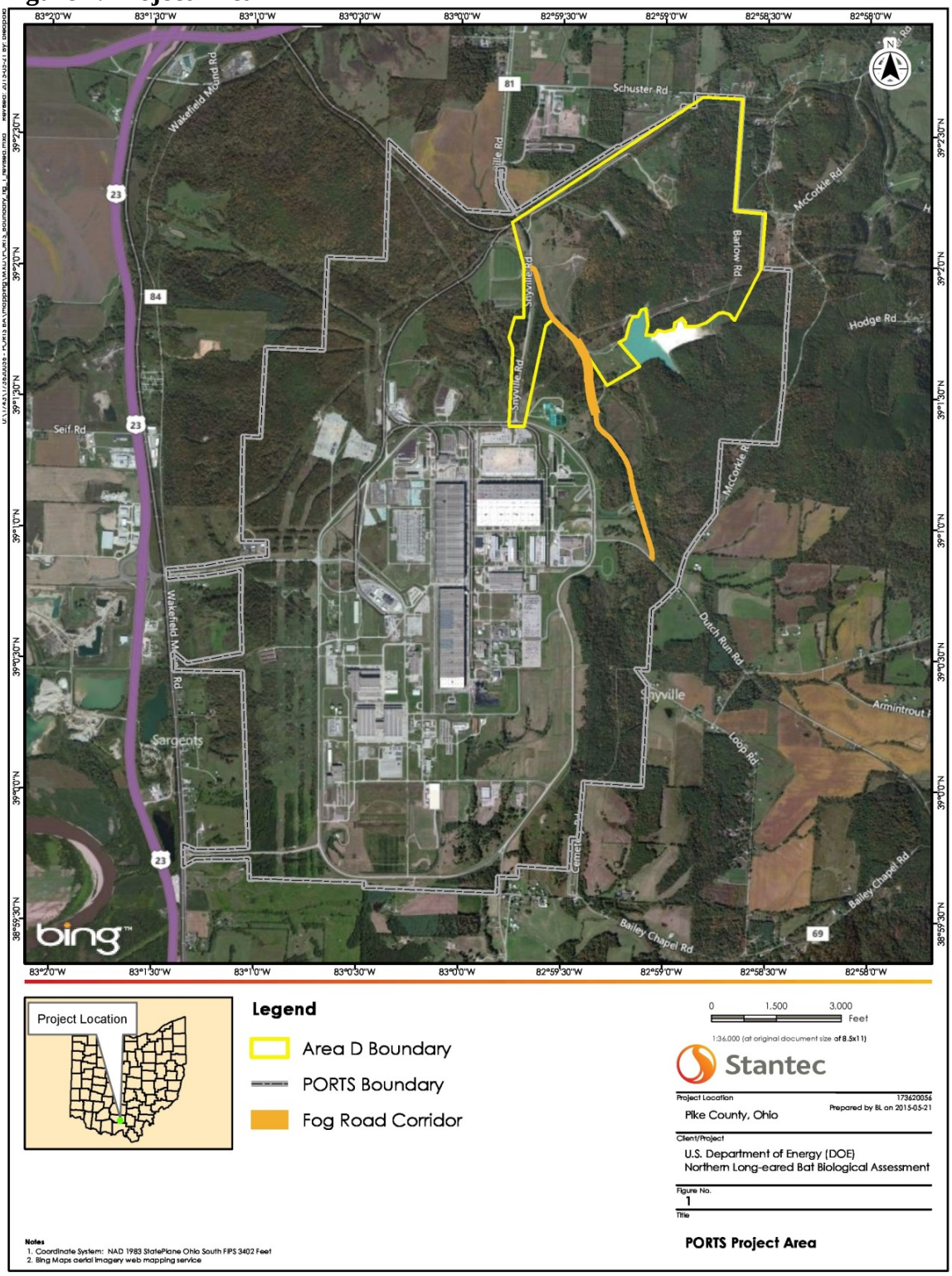
PORTS is located on a federal reservation in south-central Ohio. The 3,777-acre facility is located 20 miles north of Portsmouth, Ohio, and 4 miles south of the village of Piketon in Pike County (See Figure 1). The PORTS gaseous diffusion process enriched uranium from 1954 to 2001 for the U.S. Department of Energy (DOE) and its predecessor organization (Atomic Energy Commission), the Naval Nuclear Propulsion Program, and commercial customers.

DOE proposes construction of the OSWDF in Area D (Figure 1) for the disposal of impacted material produced from the decontamination and decommissioning (D&D) of PORTS. The construction of the OSWDF at PORTS is being conducted as an action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA).

The overall description of the on-site waste disposal project involves siting and constructing an engineered OSWDF with operation of the facility for disposal of anticipated PORTS waste. Impacted material not meeting the facility waste acceptance criteria (WAC) will be shipped to an appropriate off-site disposal facility already permitted and in operation. On-site disposal is comprised of the following general response actions: institutional controls, centralized treatment, on-site disposal, recycling and/or reuse, and impacted material transportation.

The overall OSWDF project will be designed, built, and operated to accept low-level (radioactive) waste (including classified waste); Resource Conservation and Recovery Act of 1976, as amended (RCRA)-defined hazardous waste; Toxic Substances Control Act of 1976 (TSCA) waste; construction and demolition debris; solid waste; and combinations of these regulatory waste types. The OSWDF will be constructed using a multi-layered liner system, and ultimately capped with a final multi-layered capping system designed to meet long-term infiltration requirements.

Figure 1. Project Area



Details regarding siting, alternatives development and selection, and compliance with applicable or relevant and appropriate requirements (ARARs) can be found in the *Remedial Investigation and Feasibility Study Report for the Site-Wide Waste Disposition Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio* (DOE 2014) (Waste Disposition RI/FS) and are herein incorporated by reference.

The following are key elements of the project:

Establishment of final WAC for the OSWDF. These criteria will include concentration-based limits for the placement of discrete waste constituents in the OSWDF so as to meet ARARs and ensure the long-term protectiveness of human health and the environment, including groundwater resources at the down-gradient edge of the facility.

Transportation and disposal of D&D impacted material meeting the WAC for the OSWDF. Impacted material not meeting the acceptance criteria will either be treated (through this project or through the waste generating project) or shipped and disposed of off-site at disposal facilities approved for receipt of such impacted material.

Transportation and disposal of some non-radiologically contaminated and nonhazardous D&D waste within the OSWDF or at an appropriately permitted local, off-site solid waste disposal facility.

Construction and operation of centralized size reduction or decontamination processes and/or staging of recovered materials in support of recycling and/or reuse initiatives in compliance with ARARs.

Design, construction, and operation of an OSWDF satisfying both design-based and performance-based requirements of DOE and other substantive requirements and guidance developed and documented in the ARARs to be considered for the OSWDF. The OSWDF is envisioned to be built in modular fashion with individual lining systems to ensure sufficient capacity to support D&D activities, but without the risk of developing excess disposal capacity.

The infrastructure supporting the OSWDF will include wastewater treatment designed for the waste constituents and throughput from anticipated leachate from OSWDF operations as well as other wastewaters that may be generated.

Haul roads appropriate to transport impacted material from the generation area to the OSWDF would be built.

Fill material, for purposes of supporting waste placement in the OSWDF, is anticipated to be from on-PORTS borrow locations. Fill is always designated as having soil-like properties. The infrastructure supporting the OSWDF will include an impacted material staging area where impacted material can be held on a non-permanent basis, such as when operations at the OSWDF have been suspended for weather. This staging area allows staging of impacted material for

logistics purposes to support the optimal mixture of impacted material requiring fill and soil at the OSWDF.

The project includes the appropriate institutional controls at the OSWDF to prevent access to the impacted material in the future.

Long-term maintenance, surveillance, and monitoring are included.

The OSWDF will provide for impacted material generated through the conduct of PORTS cleanup activities outside of the *April 13, 2010 Director's Final Findings and Orders for Removal Action and Remedial Investigation and Feasibility Study and Remedial Design and Remedial Action, including the July 16, 2012 Modification thereto* (DFF&O) to be disposed in the OSWDF. Such impacted material could include non-DFF&O environmental media and other materials generated during cleanup activities.

In addition to the OSWDF development, Fog Road will be improved by widening the road to support a level of service increase from a 500 vehicle average daily traffic (ADT) count to approximately 5,000 ADT. Fog Road provides public access from the North Access Road to the East Access Road along the eastern portion of the PORTS property. The north terminus will include an overpass to provide access over the OSWDF impacted material transfer area (IMTA) haul road. The roadway improvements will follow the existing Fog Road right-of-way until the first bend where it will deviate to new right-of-way and a new crossing of Little Beaver Creek. The improvements are designed to keep traffic moving at a consistent speed until ending at the southern terminus with the East Access Road.

Overall, the corridor will be a 100-ft easement with some wider areas near the new creek crossing for building up the roadway. The new right-of-way near the creek crossing will remove approximately 8 acres of forested habitat. Widening of the remainder of the roadway will include another 2 acres resulting in an approximate 10 acres of forest area cleared. The Fog Road improvements will need to be in place prior to construction of the IMTA haul road. See Figure 1 for the location of the Fog Road corridor.

Construction

Construction activities for the OSWDF will include site preparation, construction of support facilities, disposal cell liner construction, and capping which are described as follows.

Site Preparation: Site preparation actions will be performed to minimize environmental impacts, as required in the ARARs for site preparation and discussed in the Waste Disposition RI/FS. Site clearing and grubbing will occur to remove trees and other vegetation to provide sufficient open area for construction. For site preparation, clearing and grubbing will be required across the entire OSWDF project area with approximately 205 acres requiring tree removal. All tree clearing will occur during autumn or winter (October 1 through March 31) to minimize direct impacts to the northern long-eared bat during the summer maternity season.

The footprint for the disposal cell will be prepared, including removal of bedrock (if present), to provide a below-grade bedrock base for the facility and similar side slopes for lateral containment. The surplus excavated soil and rock material from construction of the first three cells will be hauled (as it is excavated), dumped, compacted and graded to facilitate development of the OSWDF support area and facilities. It is contemplated that surplus excavated soil and rock resulting from the excavation required for the remaining cells may be transported to the X-611B Sludge Lagoon, which is located approximately 0.75 mile south of the OSWDF project area, to support closure of that facility.

Construction of Support Facilities: Existing gravel roads planned for use will be upgraded. New paved and gravel roads will be constructed for the construction and operation of the OSWDF (as required). A temporary haul road from the D&D area and access roads for the support facilities will be constructed, and the IMTA will be developed. Detention basins, runoff control ditches, and placement of support facilities, as well as the cell itself, will be constructed to prevent run-off and protect streams from construction activities.

Water, electricity, and telephone lines will be established on site. Temporary fences and gates will be installed to restrict access to the controlled area of the operation. Additionally, temporary office and change facilities, as well as storage buildings, will be installed as required.

Disposal Cell Base Liner Construction: As site preparation activities are underway, construction of the cell will begin. The disposal cell will be constructed in phases consistent with impacted material generation schedules. In general, it is assumed that only one cell will be constructed at a time. Once operational, construction will begin on the next cell.

Capping: When the initial cells are filled, and the side slopes are sufficiently stable, a portion of the final cap will be installed with a geosynthetic liner extending out enough to allow for seaming with the adjacent liner. This sequence will continue until the requisite capacity is achieved.

Wetlands, floodplains, and aquatic resources are present on the PORTS facility. The OSWDF project area is not within a 100- or 500-year floodplain, and none of the planned activities are expected to impact floodplain areas. There are six jurisdictional wetlands in the project area that may be affected by construction activities. These wetland and aquatic resources will be appropriately protected or mitigated in accordance with the location-specific ARARs, as appropriate.

Activities will be designed to avoid or minimize impacts to wetlands. To mitigate impacts to wetlands that cannot be avoided, other wetlands will be restored, enhanced, or preserved elsewhere on PORTS at a ratio of 1.5 to 1 for nonforested impacted wetlands and a ratio of 2 to 1 for forested impacted wetlands. Currently, 0.348 acre of wetlands is anticipated to be impacted, resulting in a need to restore, enhance, and/or preserve 0.626 acre of wetlands. The final wetland impacts and details of the mitigation plan will be incorporated into the remedial design.

There are numerous streams in the area of the OSWDF project. An estimated 14,335 linear ft. of streams in the project area may be directly impacted by construction of the OSWDF. Of those impacted streams, 2,419 linear ft. are a Class IIIA primary headwater habitat. To mitigate the estimated impacts on the streams for the OSWDF project, it has been calculated that 14,335 linear ft. of streams will be restored, enhanced, and/or preserved elsewhere at PORTS. This initial calculation of mitigation requirements resulted in a little over a 1 to 1 ratio using the estimated stream impacts and the quality of the streams assumed to be impacted. Should the actual stream impacts vary from that original estimate, the stream mitigation ratio will be recalculated using Ohio Environmental Protection Agency's (EPA's) stream mitigation protocol. The final stream impacts and details of the mitigation plan will be incorporated into the remedial design.

Lighting: It is anticipated that some construction activities will occur during the night. Typically, this will occur during early morning hours and at the end of the day, and it will be more common during winter hours when daylight hours are limited. There is the potential that there will be times when work will occur through all, or part of, the night, in order to stay on schedule or take advantage of good weather. Trailer areas are required to be illuminated all night.

Operations

The OSWDF is designed for 10 cells and 2 contingent cells with a total capacity of approximately 5 million cubic yards of impacted material. The ratio of soil to debris for the OSWDF is 2.4:1. Impacted material destined for the OSWDF will be adequately characterized, processed, inspected and verified as meeting the OSWDF WAC.

Trucks will transport the impacted material to the OSWDF along a dedicated haul road. Trucks carrying impacted material will first be weighed along the haul road and then enter the facility and proceed to the impacted material off-loading area within the OSWDF. All impacted material will be deposited into the cell and grid as directed by the cell supervisor or to the IMTA for staging. The grid system within the disposal cells will be used for impacted material placement and tracking purposes. Placement information will be recorded daily upon receipt of impacted material in the disposal cell, as required by the Impacted Material Placement Plan.
The IMTA will provide storage capacity to accommodate higher than anticipated impacted material generation that exceeds the immediate capacity for receipt or to accept impacted material deliveries during inclement weather when impacted material placement operations are curtailed.

Large impacted material items, and solidified items meeting the single-waste-item physical WAC can be accepted if special handling arrangements were made. Limitations on large impacted material /equipment will be developed to minimize void spaces in the disposal cell and to prevent damage to the liner system. Generally, impacted material generators will use size reduction equipment at the D&D location to meet this requirement.

Impacted material will be placed in lifts and compressed using dozers and/or wheeled landfill compactors. Impacted material will be placed to minimize possible damage to the geotextile layer and minimize void spaces after backfilling. Void spaces in the impacted material will be filled with excavated soil or flowable fill to reduce voids, achieve required compaction of the impacted material mass, and provide a stable base for impacted material transport vehicles. It is also assumed that several cells/grids will be active. Stationary and/or mobile water sprinkling units may be installed to control dust within the facility during operations. Dust control will also be achieved by using dust suppressant sprays as the impacted material is emptied from transport vehicles into the facility.

Operations other than impacted material handling will include heavy equipment maintenance and support facility maintenance such as roads and buildings. The disposal facility will use a combination of telephone and radio communications, computers, and alarm systems to provide normal operations communication, traffic instructions, and immediate emergency instruction to operations and transport personnel. The OSWDF operations will rely on the PORTS Fire Department and other on-PORTS first responders to control major fires or other medical emergencies.

All operations will be conducted in accordance with DOE Order 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*, and 10 *CFR* 835 radiological requirements. Operations workers will wear proper personal protective equipment, including coveralls, gloves, sturdy shoes, and respiratory devices (as required). Air quality will be monitored using continuous air monitors and grab samplers. The cell placement manager with site training, will develop a training program compliant with applicable federal, state, and DOE training requirements. The training program and health and safety requirements will be designed to prepare employees to manage and maintain the disposal facility in a safe, effective, and environmentally sound manner. In addition, the landfill will develop a facility emergency plan that would describe hazards and the basic responses to upset and/or emergency conditions.
In accordance with ARARs, groundwater monitoring will occur during impacted material disposal operations. The list of monitoring constituents, sampling media, locations, frequency, and action levels will be defined in the Monitoring Plan. Monitoring will include groundwater elevations and sufficient samples to represent the quality of groundwater beneath the cell, and allow for the detection of potential contamination should constituents migrate from the cell or support areas. Samples will be analyzed for both radiological and non-radiological constituents at an approved laboratory. An annual environmental monitoring report will be prepared to summarize sample collection and the analytical results.

Lighting: Based on safety and security requirements, the IMTA, Haul Road fence, IMTA, trailer areas, and active cell area will be illuminated at night when the cell/IMTA becomes operational, and is designated as a limited area for security reasons.

Limited portions of the Fog Road (by the underpass) will be illuminated at night by lighting on the IMTA Haul Road safety and security fence lighting. This will occur when the

cell/IMTA becomes a limited area for security reasons.

Closure

It is expected that final capping will occur shortly after disposal cells are filled to capacity. Other final activities will include installation of the permanent leachate treatment systems (including both the active system and passive system), removal of the interim leachate treatment system and other support facilities, and site restoration. Restoration could include removal of the sediment ponds, replacement of wetlands (if necessary), and grading and seeding of the disturbed areas outside the disposal cell to restore herbaceous vegetation. Once the support facilities are removed and disposed in the last disposal cell, the facility will be capped with the permanent cover. The DFF&O requires submittal of a Draft Closure Plan, Completion of Remedial Action Report, and Closure Certification Report pursuant to the DFF&O subject to Ohio EPA review and concurrence and/or approval as applicable.

Post-Operation

During development of the support facilities, monitoring of the disposal facility and its environs will begin as soon as monitoring facilities are installed. Historic information and results from pre-operation monitoring will be used to develop a baseline for comparison with post-operation monitoring results. Surveillance, monitoring, and active maintenance will occur after the OSWDF is capped. It is expected that these activities will occur for a 30-year period. After that time, surveillance and monitoring will continue, but active maintenance ceases.
The post-operations activities and associated reporting requirements will be conducted in accordance with approved facility-specific surveillance, maintenance, and monitoring plans. Activities will include the following:

Surveillance: An integral part of post-operations care is surveillance and inspection. The OSWDF will be inspected to verify adequate performance of the installed containment features and to alert the DOE and regulatory agencies of any potential problems. The inspections will provide an early warning that specific elements may need more careful evaluation and monitoring.

After the fifth year of post-operations and upon completion of the first DFF&O five-year review, inspection frequency is expected to be adjusted as appropriate. Biennial or less frequent scheduled inspections may be acceptable for certain elements.

Maintenance: Post-operations maintenance activities will include the clearing of uncontrolled plant growth from the disposal cell crest and side slopes; clearing, repair, and realignment of surface water transport structures; inspection and maintenance of the permanent leachate treatment system and passive leachate treatment system; replacement of signs; reestablishment of survey monuments; and collection of piezometer data. Undesired plant growth will be cleared annually, as needed. Ditch realignment, fence and sign repair, survey monument

reestablishment, and other minor maintenance activities will be conducted on the basis of surveillance findings.

Long-term Monitoring: Long-term media monitoring (groundwater, surface water, air, and biota) will be performed to detect potential releases from the disposal cell. Groundwater wells located up-gradient and down-gradient of the disposal cell will be sampled at least annually to monitor indicator radiological and non-radiological contaminant concentrations and determine whether there have been contaminant releases from the disposal cell. Continued monitoring will support 5-year reviews under the DFF&O (40 *CFR* 300.430 [f][4][V]). The surface water downstream from the disposal cell will be monitored to determine whether contaminant levels have changed over time. Surface water monitoring will be conducted during operation of the facility and through post-operations care in support of five-year DFF&O reviews. A detailed monitoring plan will be developed.

Deed Restrictions and Environmental Covenant: In accordance with ARARs and following the DFF&O, deed restrictions and an Environmental Covenant will be put into place to prohibit residential and industrial use of the property, construction of any facility that could damage the cover, or installation of groundwater extraction wells (for purposes other than monitoring). These deed restrictions and Environmental Covenant will also identify other administrative controls necessary to protect the public and the integrity of the disposal cell and will be referenced in a future deed, which will be filed with the appropriate local governmental authority.

Off-Site Disposal

DOE Manual 435.1-1, *Radioactive Waste Management* (DOE 2001), establishes policies and minimum requirements by which DOE manages its radioactive waste, the radioactive components of mixed low-level (radioactive) waste, RCRA waste, and/or TSCA waste stemming from the cleanup and/or D&D of contaminated facilities. Chapter 1 of the manual specifically addresses the management of radioactive waste and states that low-level (radioactive) waste shall be disposed on the site of origin, if practical, or at another DOE facility if on-site disposal capacity is not available.

For PORTS actions that transfer impacted material off-site, permits are required at the receiving facility. Possible off-site disposal locations include the Nevada National Security Site, Energy*Solutions*, and Pike Sanitation Landfill. The mixed low-level (radioactive) waste disposal facilities at the Nevada National Security Site and Energy*Solutions* are permitted by Nevada and Utah, respectively. Also, all impacted material removed from PORTS must be disposed of, or treated at a disposal facility operating in compliance with the procedures for planning and implementing off-site response actions, as outlined in 40 *CFR* 300.440 (U.S. Environmental Protection Agency's "off-site" policy). The purpose of this policy is to direct CERCLA wastes to disposal facilities determined to be environmentally sound and to avoid contributing to present and future environmental problems.

Conservation Measures

Conservation measures are those actions taken to benefit or promote the recovery of the species. These actions taken by the federal agency 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 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. DOE 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 NLEB. When related to construction, DOE will provide clear instructions and restrictions in the construction contract to legally bind the contractor to implement the project per the conditions outlined below.

1. The area used for construction will be limited to areas within work limits and specified impacted material areas. Portions of the OSWDF project area and the Fog Road improvement corridor will only be cleared if necessary, which will minimize the loss of suitable habitat.

2. Trees will be cleared within OSWDF grading limits and ancillary work areas, including the Fog Road improvement corridor, between October 1 and March 31, avoiding a direct take of individuals during the time when maternity colonies are active.

3. A restriction in construction contract plans will require the contractor to restrict all tree clearing to the period of October 1 through March 31.

4. If a sick, injured, or dead bat is encountered during construction and operation, contractors and/or site manager will safely isolate/containerize the bat so that work can proceed and the services of a federally-permitted bat scientist can be obtained to determine the species and to contact the Service for testing and disposal guidance.

5. During construction, operation, closure, and post-operation, DOE and its contractors will follow strict guidelines dictating the use and handling of hazardous materials and other contaminants, which will minimize the potential for downstream impacts to water quality and/or the bat prey base.

6. A restriction will be incorporated into the construction contract requiring contractors to develop and comply with a project-specific emergency spill response protocol.

7. A restriction will be incorporated into the construction contract requiring contractors adhere to DOE's guidance for Removal of Regulated Wastes from the work area.

8. Dust will be controlled for the duration of the project.

9. Winter de-icing agents will be applied at minimum effective rates.

10. Equipment fueling and maintenance areas will be located at least 100 feet from any waterbody (e.g., stream, wetland, and/or pond).

11. During construction and as it affects post-operations, contractors will develop and implement a comprehensive sediment and erosion control plan to avoid down-stream impacts to waterways potentially used by bats.

12. A restriction will specify that sedimentation and erosion control features be placed as soon as practicable during the construction process. Provisions for placement of primary sedimentation and erosion control features, necessary during advanced tree-cutting operations, will be included.

13. Contractors will develop and incorporate provisions to protect surface and groundwater quality by using erosion control practices appropriate for the terrain and approved best management practices.

14. Contractors will develop and incorporate provisions for implementation of a post-operation re-vegetation plan to control erosion and maintain water quality.

15. Post-operation, revegetation of disturbed areas will occur as necessary, including consideration for the use of native herbaceous and woody plants as determined appropriate. Sideslopes not situated on the OSWDF will not be mowed or sprayed with herbicides, with the exception of areas where maintenance for sight distance and safety is necessary, allowing these areas to revert to a natural habitat type that might be used by the bat. These activities also reduce the potential for contaminated runoff and adverse impacts to the bat, water quality, or the aquatic prey base.

16. Post-operation stormwater pollution prevention measures will be incorporated into project design and construction activities. Use of detention basins and retention ponds will be considered wherever practicable, and, although the specifics of individual appurtenances have not been identified at the current level of design, it is anticipated that they will be placed within the construction corridor. Temporary and permanent stormwater control appurtenances will be designed to limit in-stream sedimentation, which will minimize the potential for impacts to water quality and the aquatic prey base.

17. Maintenance that involves tree removal (unsafe trees), limbing/pruning, or similar activities will be scheduled from October 1 to March 31 to avoid disturbing roosting bats.

18. The DOE will mitigate the impact to jurisdictional wetlands in accordance with the substantive requirements of the 401 and 404 Permits. To mitigate impacts to wetlands that cannot be avoided, other wetlands will be restored, enhanced, or preserved elsewhere on the

PORTS site. The final wetland impacts and details of the mitigation will be incorporated in the remedial design in conjunction with Ohio EPA. An estimated 14,335 linear ft. of streams will be restored, enhanced, and/or preserved elsewhere on the PORTS site. The final stream impacts and details of the mitigation plan will be incorporated into the remedial design in conjunction with Ohio EPA. Where feasible, suitable available habitat contiguous with the impacted area will be used to facilitate the wetland and stream mitigation measures. DOE will attempt to identify comparable acreages in the adjacent area to be employed for the mitigation measures. DOE will continue to explore the preservation of an adjacent area to potentially preserve woodland habitat and preserve and enhance stream and wetlands habitat to mitigate impacts resulting primarily from the construction of the OSWDF in Area D. The preservation, creation, restoration, or enhancement of wetlands under these permits may provide foraging and roosting habitat, and maintain and improve downstream water quality and the prey base of the bat.

19. Mitigation, restoration, or enhancement is anticipated to be located on PORTS property, however, not within the OSWDF. It is anticipated it will be in the Little Beaver Creek watershed near the OSWDF project area where the majority of impacts from the project occur.

20. Use natural stream channel design features in areas where the relocation of existing streams is necessary and feasible, with a goal of establishing long-term channel stability.

21. Implement provisions to develop and maintain natural stream design (morphology and hydrology) and streamside vegetation potentially used by bats as travel corridors and/or foraging areas.

22. Consideration will be given to maintaining open water areas in the OSWDF support areas by leaving detention basins in place post closure. In addition, mitigation measures implemented at the site may include the establishment of permanent open water areas in the current footprint of 611B or other mitigation areas identified at PORTS. Consideration of such features provides for cleaner drinking water for bats because they are less likely to be contaminated by chemicals found in groundwater/and or collected by surface streams.

23. No burning of tree and brush materials from clearing and grading activities will occur for the project thereby avoiding any effects to bats from smoke.

Action Area

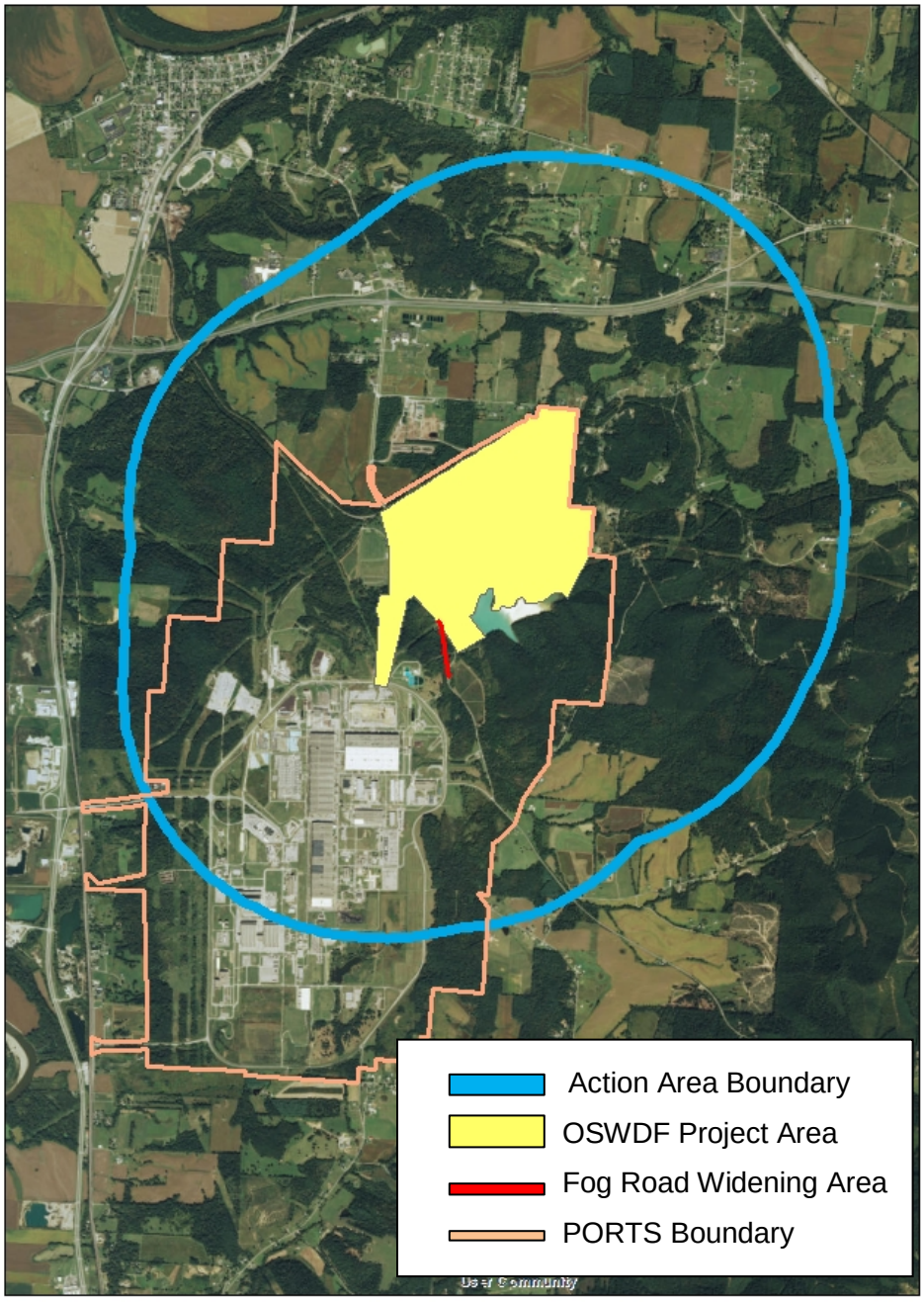
In 50 CFR §402.02 "action area" is defined as, "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area is not limited to the footprint of the action and should consider the effects to the environment resulting from 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 (USFWS and NMFS 1998). Therefore, the action area includes the OSWDF project footprint and the geographic extent of the area that could be affected by the construction, operation, and maintenance of the facility either directly, indirectly, or through interrelated or interdependent actions.

The OSWDF project will include clearing and grading of the temporary and permanent areas for construction of the on-site disposal facility and support facilities including . It includes all areas that will be physically impacted, as well as areas that may be impacted by noise, or downstream movement of sediments.

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 for clearing, grading, and construction equipment (The Engineering ToolBox 2015; NoiseNet.org 2015).

The construction, maintenance, and operation of the OSWDF project will result in direct and effects and indirect effects throughout the project area and the surrounding area up to 1.3 miles from the project boundary. Therefore, the action area for this consultation is the entire OSWDF project boundary, the Fog Road widening area, and a buffer distance of 1.3 miles around these areas (Figure 2). The 1.3-mile buffer distance is used to incorporate all potential effects of the project to NLEBs. The action area encompasses approximately 7,594 acres (~11.8 sq. miles).

Figure 2. Action Area



STATUS OF THE SPECIES

PORTS lies within the range of the federally listed endangered Indiana bat (*Myotis sodalis*), clubshell (*Pleurobema clava*), northern riffleshell (*Epioblasma torulosa rangiana*), and rayed bean (*Villosa fabalis*), and the threatened NLEB. Presence/absence surveys for federally listed bats confirmed probable absence of the Indiana bat on PORTS property and confirmed presence of the NLEB. No streams harboring populations of clubshell, northern riffleshell, and rayed bean occur on PORTS or will be affected by the OSWDF project. Therefore, this Biological Opinion only considers the NLEB. The Indiana bat, clubshell, northern riffleshell, and rayed bean will not be considered further in this Biological Opinion. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, DOE should contact the Service to determine whether consultation is necessary for these species not included in this Biological Opinion.

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 a 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 2014). NLEB show some degree of interannual fidelity to single roost trees and/or maternity areas. Male NLEB are routinely found with females in maternity colonies. NLEB use networks of roost trees often centered around one or more central-node roost trees, commonly referred to as maternity 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 2014), 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 white-nose syndrome (WNS). It is unlikely that NLEB populations would be declining so dramatically without the impact of WNS. Since the disease was first observed in New York in 2007 (later biologists found evidence from 2006 photographs), WNS has spread rapidly in bat populations from the Northeast to the Midwest and the Southeast. Population numbers of NLEB have declined by 99 percent in the Northeast, which along with Canada, has been considered the core of the species' range. Although there is uncertainty about how quickly WNS will spread through the remaining portions of these species' ranges, it is expected to spread throughout their entire ranges. In general, the Service believes that WNS has significantly reduced the redundancy and resiliency of the NLEB.

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

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

In areas where WNS is present, there are additional energetic demands for 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 Indiana bat or other bat species) and some targeted research projects. In these efforts, NLEB was very frequently encountered and was considered the most common myotid bat in many areas. Overall, the species was considered to be widespread and abundant throughout its historic range (Caceres and Barclay 2000).

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

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 percent (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, its habitat, and the ecosystem within the action area. In order to assess the potential for the 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 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. The three-mile buffer is based on the typical maximum distance a NLEB will travel between roosting and foraging areas. The typical maximum distance a NLEB will travel between roosts and foraging areas is one and a half miles. When roost locations are known, COFO places a one and a half mile radius around the roosts to delineate the potential foraging area for NLEB except in cases where a NLEB travels further than 1.5 miles between its capture location and roost. In the latter case, the actual travel distance between the capture and roost location is used as the buffer.

NLEBs were first documented at PORTS during a survey conducted in 1996 (Eco-Tech 1997).

No NLEBs were captured during mist netting at PORTS, but two juvenile NLEBs were found near a PORTS building during the survey. Both were captured, identified, and released. Neither bat was radio-tracked. Although the exact locations of the captures were not recorded, the OSWDF project area is within a three-mile radius of all of the buildings at PORTS.

In 2011, another survey was conducted at PORTS for a project unrelated to the OSWDF project (EnviroScience 2011). During that survey, three NLEBs were captured among four mist net sites. All of the captures occurred within the OSWDF action area. One of the three bats, a pregnant female, was captured within the ODWDF project area. None of the NLEBs were radio-tracked so roost locations for these bats are unknown. Because roost locations are not known, a three-mile buffer has been placed around each capture location. The OSWDF action area occurs entirely within these buffers.

In 2013, PORTS had a bat mist-net survey conducted in the OSWDF project area to investigate the site for the presence of the federally listed endangered Indiana bat (*Myotis sodalis*) (Stantec 2013). The surveyors captured multiple NLEBs but did not find any Indiana bats (confirming probable absence of Indiana bats in the project area). Although at the time of the survey the NLEB was not a federally listed species, the Service was actively evaluating the species for listing under the ESA. Therefore, PORTS agreed to include radio-tracking of NLEB in the 2013 study to gather species data in the event that a future listing occurred. In April 2015, the Service officially listed the NLEB to be a threatened species under the ESA.

Nine NLEBs were captured among five mist net sites within the OSWDF project area in 2013. Captures included five adult females (2 lactating, 2 post-lactating, and 1 non-reproductive), one adult male, and three juveniles (1 male and 2 female). Four of the adult females were radio-tracked to determine roost locations. Nineteen roost trees were found during the study along with one manmade roost (utility pole). Thirteen of the roost trees are located within the area to be cleared of trees for the OSWDF. Four of the roost trees are located within the OSWDF project area but outside of the tree clearing limits. The other two roost trees and utility pole are located on PORTS property outside of the project area but within the action area.

Visual dusk emergence surveys were conducted on some roosts to determine level of usage by bats. Not all roost trees were surveyed for bat emergence. Most small roost trees capable of providing roosting space for only one or two bats were not surveyed for bat emergence. Bat surveyors concentrated their efforts on the roost trees and utility pole that possessed characteristics suitable to serve as maternity roosts.

During the study, only one maternity roost was located. This roost was located approximately one mile southeast of the mist net capture site of the bat being radio-tracked. The roost is on PORTS property, but is outside of the OSWDF project area. The roost was located under black plastic wrapping around a utility pole that provides an emergency siren for the PORTS facility and neighboring properties. Three emergence counts of the roost were conducted on separate nights and counts of 54, 51, and 53 bats were documented. All bats emerging are presumed to have been NLEB due to the presence of a radio-tagged NLEB at the roost on two of the three

nights counted.

The bat surveys on PORTS in 1996, 2011, and 2013 have documented NLEBs occurring within the OSWDF project action area. Therefore, summer presence of the NLEB has been confirmed throughout the entire action area. There have been no other summer bat survey sites within three miles of the PORTS.

A total of 14 NLEB captured during the 3 surveys at PORTS include reproductively active females and juveniles. The presence of reproductively active females and/or juvenile bats at the many of survey sites and the documentation of a maternity roost on PORTS property verifies that at least one NLEB maternity colony occurs on PORTS property. Capture data and radio-tracking also verifies that NLEBs are roosting and foraging throughout the OSWDF project area. In addition, NLEB are also presumed to be roosting and foraging throughout the 7,594-acre project action area. In addition, the surveys confirmed that the action area also supports male and non-reproductive females during the summer.

The exact number of individual NLEBs in the action area is unknown. We estimate that there are two maternity colonies of NLEB in the action area based on the following calculations:

- There are approximately 7,594 acres in the action area
- Approximately 58.5 percent of the action area is forested (McConnell and Fisher 2012): 7,594 x 0.585 =
  4,442 acres of forested habitat available to the species
- 2.47 acres/ha; 4,442 acres/2.47 = 1,799 ha
- Average group size of NLEB = ~5 bats/group (Johnson et al. 2012)
- Average colony size of NLEB = ~60 (USFWS 2015)
- 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
- 1,799 ha/996 ha = ~2 colonies

Fall, Winter, and Spring Habitat

No abandoned mines or caves are known to occur in the OSWDF project area. The action area also does not have a history of underground coal mining and it is unlikely to contain karst features. Therefore, it is unlikely that there are portals to abandoned underground coal mines or

caves in the action area that may serve as fall swarming and/or winter hibernacula for NLEBs.

Conservation Needs in the Action Area

The conservation needs of the NLEB in the action area are similar to their needs rangewide. The action area provides habitat for summering and migrating NLEBs. Therefore, within the action area the conservation needs include providing suitable habitat conditions for NLEB roosting, foraging, and traveling.

Habitat Conditions in the Action Area

The 7,594-acre action area is dominated by rural communities, woodland, and small agricultural farms. McConnell and Fisher (2012) report that approximately 58.5 percent of Pike County is forested. The majority of the action area is composed of developed open space and mixed forest typical of the general character in the county. Therefore, it is estimated that there are approximately 4,442 forested acres within the action area (58.5 percent of 7,594 acres) that could provide suitable habitat for the NLEB.

NLEB radio-tracked during the 2013 study utilized 19 roost trees and a utility pole. The roost trees range in size from 2.8 in. diameter at breast height (dbh) to 13.6 in. dbh and the utility pole roost is 14.6 in. dbh (Table 1.). The majority of roosts were dead trees with cavities. The only known maternity roost is the utility pole. Emergence counts of the pole found 54, 51, and 53 bats emerging on 3 separate evenings. All bats emerging are assumed to have been NLEB. Emergence counts on other roosts, when conducted, were single bats. Roosts that did not have counts conducted were presumed to only harbor one or two bats due to the lack of structure to support a large number of bats.

No bat surveys have been conducted in the action area outside of the PORTS property. It is likely that additional unknown roosts, including one or more maternity roosts, occur in the action area. Radio-tracking female NLEBs during the 2013 survey of the OSWDF project area only located one maternity roost. It is possible that one or more additional maternity roosts occur in the action area though it is likely they occur outside of the OSWDF project area. It is also likely that additional unknown non-maternity roosts occur both in the OSWDF project area and within the action area.

Table 1. Known Roosts in the Action Area

Tree Species	Scientific Name	DBH (in.)	Condition	Cavities Present
White Oak	*Quercus alba*	10.1	dead	Yes
Hickory	*Carya spp.*	6.9	dead	No
Red Oak	*Quercus rubra*	9.9	live	No
Black Locust	*Robinia pseudoacacia*	5	dead	Yes
Black Locust	*Robinia pseudoacacia*	5.3	dead	Yes
Red Oak	*Quercus rubra*	4.9	live	Yes
Red Oak	*Quercus rubra*	5.9	dead	No
Black Locust	*Robinia pseudoacacia*	3.1	dead	Yes
Red Oak	*Quercus rubra*	5.6	dead	Yes
American Elm	*Ulnus americana*	2.8	dead	Yes
Red Maple	*Acer rubrum*	7.6	live	Yes
White Oak	*Quercus alba*	3.9	dead	Yes
White Oak	*Quercus alba*	3	dead	Yes
Red Oak	*Quercus rubra*	13.6	dead	Yes
White Oak	*Quercus alba*	7.7	dead	Yes
Red Oak	*Quercus rubra*	8.9	live	Yes
Red Maple	*Acer rubrum*	5.6	live	Yes
Red Maple	*Acer rubrum*	3.9	dead	Yes
Sassafras	*Sassafras albidum*	3.1	live	Yes
Utility Pole	N/A	14.6	N/A	No

EFFECTS OF THE ACTION

This BO evaluates the anticipated effects of the OSWDF project on the NLEB. This project will require removal of 215 acres of known NLEB habitat. Potential effects to the 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 NLEB entails: (1) evaluating individual 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 NLEBs During Fall and Winter

There are no known hibernacula within the project action area and unknown hibernacula are unlikely to be present. DOE has stated that there are no cave or coal mine portals within the OSWDF project area and none are known to occur in the action area. The action area does not have a history of underground mining and it is unlikely to contain karst features. Therefore, it is unlikely that there are portals to abandoned underground coal mines or caves in the action area that may serve as fall swarming and/or winter hibernacula for NLEBs. Therefore, no effects to swarming and hibernating NLEBs are anticipated.

Effects to NLEBs during Summer

Roosting

The project will require the clearing of 215 acres of forested habitat for construction of the disposal cell and widening of Fog Road. All tree clearing for the OSWDF project will occur between to October 1 and March 31. Any future tree clearing for site maintenance will also occur between October 1 and March 31. Therefore, no tree removal will occur during the NLEB summer roosting and foraging period of April 1 through September 30 when NLEB would be present. Therefore, no direct effects to NLEBs are anticipated due to tree clearing for project construction and maintenance.

The project will require the removal of known NLEB non-maternity roosts and additional unknown non-maternity roosts. Although direct effects to NLEB will be avoided by winter tree clearing, indirect effects to NLEB may occur later in time with bats return to the project area. Loss of roost trees can have substantial implications for reproductive females. As explained previously in the Status of Species section, female and young NLEBs depend on specific roost trees for their reproductive success and survival. If their primary maternity roosts or multiple 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 multiple roosts.

We do not anticipate indirect impacts due to loss of primary maternity roosts. The known maternity roost occurs outside of the project clearing limits. Additional unknown maternity roosts may occur in the action area but these are expected to be outside the project clearing limits. However, we do anticipate that indirect adverse effects to NLEBs will occur from the removal of known and unknown secondary roosts.

We anticipate that some NLEB may be subject to take in the form of harm and harassment due to the displacement from the loss of 215 acres of habitat. Individual bats may experience a decrease in fitness due to being displaced from roosting habitat when bats return to the area

following hibernation. Upon finding that former roosting habitat within the project area has been lost, some bats will have to travel to alternate areas to roost. Somewhat decreased fitness of a small number of NLEBs may result.

Foraging

The forested habitat within the project area and within the action area provides suitable foraging habitat for NLEBs. NLEBs forage within and around the canopy of upland forests and occasionally forage over forest clearings, water, and along roads.

Direct effects to NLEBs from the removal of foraging habitat will be avoided since tree clearing will occur when the bats are not present. However, NLEBs returning to the action area following hibernation to find a large block of foraging habitat removed may be indirectly adversely affected due to a disruption in their foraging patterns. NLEBs would be subject to take in the form of harm as they are displaced from their home ranges. Due to the availability of suitable foraging opportunities in the surrounding landscape, it is likely that these bats will be able to establish new foraging patterns. However, a somewhat decreased fitness of a small number of NLEBs may result as foraging patterns are shifted. In addition, bats that remain loyal to certain foraging areas may continue to cross through the newly cleared areas and would likely have an increased risk of mortality from predation although this risk is not detectable or measurable.

Effects from Noise and Disturbance

Noise and vibration and general human disturbance are stressors that may disrupt normal feeding and sheltering activities of the NLEB. Bats may be exposed to noise, vibrations, and disturbance from equipment operation 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 Indiana bat, 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 harassment of bats and may cause some changes in bat behaviors.

Increased noise created by construction equipment within the project area could disturb bats day roosting in nearby forests during spring and summer. 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), bats could 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.

We anticipate that some NLEBs will be subject to direct take in the form of harassment due to construction noise.

Effects from Lighting

Lighting may be used during project construction during dawn and dusk later in the year when daylight hours become limited. There is also the potential for lighting to be used through all, or part of the night, in order to stay on schedule or to take advantage of good weather. Additionally, lighting will be used during operation along Fog and Haul Roads for security reasons. 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.

Lighting for the OSWDF project will occur when noise and vibration from construction is also occurring. Construction disturbance is already expected to cause bats to shift their usage of the action area. Construction lighting is unlikely to cause an additional impact on bats in the action area. Lighting for security purposes after construction is completed is also unlikely to add an additional stressor to bats who have already shifted their movement and usage pattern in the action area due to construction disturbances. Therefore, effects to bats from construction and operational lighting are anticipated to be insignificant and discountable.

Effects from Stream and Wetland Impacts

Construction activities may result in short-term adverse impacts to the water quality in the action area. There are six jurisdictional wetlands in the project area and may be affected by construction activities. Currently, 0.348 acre of wetlands is anticipated to be impacted. An estimated 14,335 linear ft. of streams in the project may also be directly impacted by construction of the OSWDF.

Sediment 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 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.

DOE 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) is expected to provide for continued clean water and aquatic foraging habitat for bats. Furthermore, all wetland and stream impacts for the project will be mitigated on PORTS property which will help to offset wetland and stream impacts from the project.

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 and discountable.

Effects from Contaminants

NLEBs could be exposed to contaminants due to dust, soil erosion/sedimentation, and through accidental spills during project construction and operation. This 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 and summer prey base for foraging 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 chemicals are anticipated to be insignificant and discountable.

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.

Pike County is 440 sq. miles in area and has approximately 28,600 residents. Of the 440 sq. miles, approximately 165,000 acres (approximately 58.5 percent) are forested (McConnell and Fisher 2012). Roughly 87 percent of the forested land is privately owned (McConnell and Fisher

2012). Pike County contains 1.04 billion board feet of saw timber, making it a major contributor to Pike County's economy. However, those areas that are included within the Action Area are primarily owned and managed by DOE. While timber harvest may occur on a small scale, it is expected that adequate forested areas within the Action Area will remain.

The Service is unaware of any other 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 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 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 are anticipated due to noise disturbance from construction activities that may harass bats and cause them to alter their roosting and foraging activities. Indirect effects to individual bats include harm as a result of removal of known and unknown roost trees and loss of foraging habitat. The potential for indirect effects to be greatest is in the spring when bats return to the area and find roosting and foraging areas gone.

Impacts to Populations

As we have concluded that individual bats are likely to experience harm and 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 do not anticipate that any primary maternity roosts will be lost due to the proposed action. We recognize the potential for some bats to be harmed or harassed due to noise and loss of habitat. Therefore, we believe the NLEB colonies affected should be able to sustain this level of non-lethal take.

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 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 NLEB. Therefore, we do not anticipate a reduction in the likelihood of both survival and recovery of these 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 NLEB. No critical habitat has been designated for the NLEB; 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.

AMOUNT OR EXTENT OF TAKE

Incidental take of NLEB present in the action area could occur due to loss of habitat and noise disturbance during construction. The Service anticipates incidental take of the 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) NLEB form widely dispersed maternity colonies under loose bark or in the cavities of trees and man-made structures, and males and non-reproductive females may roost individually which makes finding the species or occupied habitats difficult; and (3) incidental take is expected to be non-lethal and likely undetectable.

The Service anticipates that no more than 7,594 acres of habitat occupied by 2 NLEB maternity colonies, and individual male and non-reproductive NLEBs will be disturbed and 215 acres of habitat cleared as a result of OSWDF project. NLEB is known to be present on the entire 215 acres to be cleared.

We anticipate that some male, female, and juvenile NLEBs may be harmed and harassed during construction of the OSWDF project in the active season from April 1 to September 30. We anticipate that clearing during the active season will result in take in the form of harm or harassment of individuals from two NLEB maternity colonies and multiple individual male and non-reproductive female NLEBs

Monitoring to determine actual take of individual bats within an expansive area of forested habitat is a complex and arduous task. However, the potential roosting and foraging habitat affected can be used as a surrogate to monitor the level of take. Therefore, DOE must reinitiate consultation with the Service if more than 215 acres of forested habitat are removed during the project.

EFFECT OF THE TAKE

Overall, the harm and harassment of individuals from two NLEB maternity colonies, and individual male and non-reproductive female 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 the NLEB. No critical habitat has been designated for NLEB, so none will 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 NLEBs during the construction and operation of the OSWDF project.

1. DOE must monitor the project to verify that the authorized level of take (215 forested acres) has not been exceeded.

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

TERMS AND CONDITIONS

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

1. DOE will monitor tree clearing limits to ensure no more than 215 acres of trees are cleared for

the project.

2. If dead or injured bats are encountered at any time during project construction and operation, the number and location must be reported to DOE by appropriate project management or supervisory personnel. The procedures in #3 below must also be followed. In addition to encountering dead or injured bats, contractors and PORTS staff present on the project area must be diligent and aware of other factors that might indicate bat presence such as watching for bats flying away from areas where activities are occurring. These data will be reported to the Service as described in #3 below.

3. If a dead or impaired 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 is not unnecessarily disturbed. The dead or impaired bat should be photographed prior to disturbing it or the site. The Service is to be notified within 24 hours upon locating a dead or injured 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.

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 7,594 acres of habitat occupied by NLEBs
2. Removal of 215 acres of habitat occupied by NLEBs
3. Harm and harassment of individuals from two NLEB maternity colonies and multiple male and non-reproductive female NLEBs within the action area.

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 DOE, would further the conservation of the NLEB.

1. DOE should seek opportunities to provide for bat education and outreach for staff and visitors of the PORTS facility.

2. DOE should seek opportunities to provide replacement trees to offset the loss of forested habitat for the OSWDF project.

3. DOE should seek opportunities to permanently protect forested habitat at PORTS.

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 DOE's actions outlined in your request received September 28, 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 215 acres of forested habitat is removed); (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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