



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

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IN REPLY REFER TO:

FWS/AES-TE

**JUL 17 2013**

### Memorandum

To: Assistant Regional Director

Through: *Acting* Chief, Division of Endangered Species *Susa Mandell*

From: Regional HCP Coordinator *Van Uyem*

Subject: Statement Of Findings and Recommendations regarding the Proposed Issuance Of An Endangered Species Act Section 10(A)(1)(B) Incidental Take Permit For The Buckeye Wind Power Habitat Conservation Plan, (hereafter "Project") Champaign County, Ohio.

### I. Description of the Proposed Action

On July 17, 2013, the U.S. Fish and Wildlife Service (Service) proposes to issue an Incidental Take Permit (Permit) to Buckeye Wind, LLC (Buckeye Wind) under the authority of Section 10(a)(1)(B) and section 10(a)(2) of the Endangered Species Act of 1973, as amended (ESA). The Permit would have a term of 30 years. The following documents were used in preparation of this statement of findings and recommendations and are incorporated by reference as described in 40 CFR §1508.13: (1) the Final Buckeye Wind Power Project Habitat Conservation Plan (HCP) (the Project) (Stantec 2013); (2) the Service's Final Environmental Impact Statement for the Project (Service 2013a) pursuant to the National Environmental Policy Act; and (3) the Service's Biological Opinion (BO) for the Project (Service 2013b). The decision record for these findings and recommendations is on file at the Service's Columbus, Ohio, Ecological Services Field Office.

## II. Project Description, Covered Activities, Covered Lands, and Covered Species

The Action Area is an approximately 32,395-ha (ha; 80,051 ac) area that includes portions of Union, Wayne, Urbana, Salem, Rush, and Goshen Townships in Champaign County in west central Ohio. The Project would consist of up to 100 wind turbines, each with a nameplate capacity rating of 1.6 to 2.5 MW, resulting in a total generating capacity of up to 250 MW for the facility. The Project would also include construction of access roads, crane paths, electrical interconnection lines, staging areas, a substation, permanent meteorological towers, temporary concrete batch plants, and an operations and maintenance (O&M) facility. Additionally, the Project includes operation, maintenance, decommissioning, mitigation, and monitoring. Collectively, these actions comprise the Covered Activities. The Action Area plus the mitigation land comprise the Covered Land.

The Project is located in a rural setting, with the landscape primarily composed of agricultural properties with wooded areas interspersed throughout. Several small towns (such as Mutual and Cable) occur within the Action Area along with scattered individual homes and low-density residential areas. The Project is expected to operate at an average annual capacity factor of approximately 30 percent, resulting in approximately 657,000 megawatt hours (MWh) of electricity generation per year (assuming an installed capacity of 250 MW). The energy generated by the Project would collect to an electric substation in Union Township in Champaign County.

Under the Project and Permit number (TE66315A), Buckeye Wind will receive incidental take coverage for one federally listed species that may be adversely affected by the Project—the endangered Indiana bat (*Myotis sodalis*). This species is the only Covered Species under this HCP.

Buckeye Wind seeks to avoid and minimize take of the Indiana bat to the maximum extent practicable, but because take may be unavoidable, Buckeye Wind will mitigate for such take by implementing conservation actions to benefit recovery of the Indiana bat. Mitigation consists of protecting Indiana bat habitat around a hibernaculum in Ohio and/or at an established Indiana bat mitigation bank. Additional conservation actions involve conducting research on Indiana bat and wind turbine interactions. Mitigation costs are estimated in the HCP. A maximum take limit has been established for the Indiana bat over 1-year, 5-year, and 30-year periods. Buckeye Wind's proposed mitigation measures were developed in coordination with the Service and the Ohio Department of Natural Resources, Division of Wildlife (ODNR DOW).

The HCP establishes avoidance and minimization measures, and mitigation and adaptive management procedures to avoid exceeding the take limit for Indiana bats authorized by the Permit. Avoidance and minimization measures, mitigation and adaptive management procedures, and the effects of the proposed action on the Indiana bat are analyzed in depth in the HCP and the Service's BO on this Permit action, both of which are incorporated herein by reference.

### **III. Relationship to Section 7 of the ESA**

Pursuant to section 7(a)(2), all federal agency actions (including the Service's issuance of the Permit) must be reviewed to determine whether such actions are likely to jeopardize the continued existence of any federally listed or proposed species or likely to cause destruction or adverse modification to designated or proposed critical habitat. The consultation conducted for this Permit and HCP implementation also addresses any proposed or candidate species that are in the Action Area. The BO summarizes and documents this section 7(a)(2) review.

In conjunction with the primary action of Permit issuance, the HCP involves federal actions carried out, or authorized by, the U.S. Army Corps of Engineers (Corps). As provided for in the section 7 implementing regulations (16 U.S.C. 402), the consultation and conference responsibilities may be fulfilled through the lead federal agency. The Service has principal responsibility, and therefore, the lead role for this consultation. The Corps, as a cooperating agency, has reviewed the BO package.

Species that were not incorporated into the HCP are covered by the section 7 analysis. Only the take species will be named on the Permit, but measures identified to reduce effects (i.e., avoidance measures) to non-covered species are incorporated into the Permit as an attachment to it, thus binding Buckeye Wind to those measures without actually including non-covered species on the Permit. Conditioning the Permit on implementing avoidance measures will give the Service the ability to enforce the measures under the provisions of 50 CFR 13.

The Corps may authorize covered activities for Buckeye Wind, and will use the information within the BO to condition their authorizations. This includes authorizations such as Section 404 Clean Water Act permits. The BO and associated documents identify measures necessary to assure the conservation of Indiana bats that may be affected by the implementation of Buckeye Wind's HCP. Incidental take coverage for the federal action agency will be granted through the incidental take statement issued with the Service's Section 7 BO.

#### IV. Analysis of Effects to the Indiana bat

The analysis of the likely Project impacts on the Indiana bat is based on the best scientific information available including population estimates, results from post-construction monitoring at other wind projects within the range of the species, field surveys conducted on the Project site, and modeling incorporating the population parameters of the species.

Activities that may affect the Indiana bat in the Action Area include construction of the wind turbines and associated infrastructure, operation and maintenance, decommissioning, and implementation of HCP mitigation, monitoring, and adaptive management measures.

Based on a number of avoidance and minimization measures Buckeye Wind included in the Project, potential impacts associated with construction, maintenance, decommissioning, and mitigation of the Project are not expected to rise to the level of take. However, operation of the facility is likely to result in lethal take of individual bats. Although measures in the HCP and associated Permit describe how Buckeye Wind seeks to avoid and minimize the risk of take of Indiana bats to the greatest extent practicable, some take may be unavoidable.

##### *Species Background*

The Indiana bat was officially listed as an endangered species on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 (80 Stat. 926; 16 U.S.C. 668aa[c]). The ESA of 1973 extended full protection to the species. Thirteen winter hibernacula (11 caves and two mines) in six states were designated as Critical Habitat for the Indiana bat in 1976 (41 FR 41914). No critical habitat occurs within or near the Covered Lands. The Service published the first recovery plan (Service 1983) which outlines recovery actions. Briefly, the objectives of the plan are to: (1) protect hibernacula; (2) maintain, protect, and restore summer maternity habitat; and (3) monitor population trends through winter censuses. The Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision (Service 2007), states that the recovery program for this species has four broad components: 1) range-wide population monitoring at the hibernacula with improvements in census techniques; 2) conservation and management of habitat (hibernacula, swarming, and to a degree, summer); 3) further research into the requirements of and threats to the species; and 4) public education and outreach. This recovery program continues to have a primary focus on protection of hibernacula (Service 1983) but also increases the focus on summer habitat and proposes the use of Recovery Units (RU) (Service 2007). The recovery program for the Indiana bat delineates four recovery units: the Ozark-Central, Midwest, Appalachian Mountains, and Northeast RUs. The Project would be constructed within the Midwest RU.

According to the 2011 Range-wide Population Estimate for the Indiana Bat by RU, the total known Indiana bat population is estimated to number approximately 424,708 bats, a 2.2% increase from the 2009 range-wide estimate of 415,512 bats (Service 2012). The Midwest RU (Indiana, Kentucky, Ohio, Tennessee, Alabama, SW Virginia and Michigan) supported approximately 71.9% of the 2011 total population estimate.

The species range includes much of the eastern half of the United States, from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida. The Indiana bat is migratory, with the above described range including both winter and summer habitat. Indiana bat records exist throughout Ohio, including the Action Area.

The Indiana bat hibernates in caves and mines in the winter (typically October through April). It is generally accepted that Indiana bats, especially females, return annually to the same hibernacula (LaVal and LaVal 1980). The timing of spring emergence from hibernacula may vary across the range of the Indiana bat, depending on latitude and weather (Hall 1962). Females tend to emerge earlier than males, usually from the end of March to mid-April. Males usually exit by the beginning of May. Female Indiana bats may leave immediately for summer habitat or linger for a few days near the hibernaculum. Indiana bats can migrate hundreds of kilometers from their hibernacula (Service 2007). After arriving at their summer range, female Indiana bats form maternity colonies that can vary greatly in size. Female Indiana bats give birth to one young each year from mid- to late-June, with lactation occurring throughout July and lasting 3 to 5 weeks, and pups becoming volant between early July and early August. Maternity colonies typically use 10 to 20 trees each year, but only one to three of these are primary roosts used by the majority of bats for some or all of the summer (Callahan 1993, Callahan et al. 1997). Indiana bats typically roost under the peeling bark of live or dead trees, and less often in cracks or crevices in the tree. Maternity roost trees are typically large diameter trees with substantial areas of peeling bark, and solar exposure for more than half of the day. Roost trees, although ephemeral in nature, may be occupied by a colony for a number of years until they are no longer available. Indiana bats typically forage in semi-open to closed (open understory) forested habitats, forest edges, and riparian areas, feeding opportunistically on insects. Once the young become volant, the maternity colony begins to disperse. Maternity colonies begin disbanding during the first two weeks in August, although some large colonies may maintain a steadily declining number of bats into mid-September (Humphrey et al. 1977, Kurta et al. 1993). Members of a maternity colony do not necessarily hibernate in the same hibernacula, and may migrate to hibernacula that are over 300 km (190 mi) apart (Kurta and Murray 2002, Winhold and Kurta 2006). Upon arrival at hibernacula, Indiana bats mate and build up fat reserves by foraging, usually in close proximity to the cave. This period of activity prior to hibernation is called swarming.

Traditional threats to the species include the following: modifications to caves, mines, and surrounding areas that change airflow and alter microclimate in the hibernacula; human disturbance and vandalism during hibernation; natural catastrophes within hibernacula during hibernation; and, loss and degradation of forested habitat. Since 2006, a new threat has emerged that may have serious implications for Indiana bat recovery—a fungal infection of hibernating bats known as white-nose syndrome (WNS). Recently, the fungus associated with WNS has been identified as a previously undescribed species *Geomyces destructans* (Gargas *et al.* 2009). The fungus thrives in the cold and humid conditions of bat hibernacula. The skin infection caused by *G. destructans* is thought to act as a chronic disturbance during hibernation (USGS 2010). Infected bats exhibit premature arousals, aberrant behavior, and premature loss of critical fat reserves which is thought to lead to starvation prior to spring emergence (Frick *et al.* 2010). WNS has now spread to 19 states and three Canadian provinces, including over 50 known Indiana bat hibernacula. WNS has been present in the Northeast Recovery Unit since 2006, resulting in a loss of 70% of the Indiana bat population since infection. WNS continues to be found at an increasing number of sites throughout the Midwest RU, and is currently documented in seven Ohio counties and suspected in one county. Another emerging risk to Indiana bats is the recent increase in the number of wind turbines being constructed and operated throughout its range. To date, 5 Indiana bat fatalities have been documented in post-construction monitoring studies at wind energy facilities, though more fatalities are likely to have gone undetected. The Service's EIS estimates that Indiana bat fatalities at all operational, under construction, and proposed wind facilities within next three years within the Midwest RU is estimated to be between 50 and 84 Indiana bats each year.

#### *Estimated Take*

Based on the analysis in the Buckeye Wind HCP (Stantec 2013), Buckeye Wind is requesting authorization to take up to 130 Indiana bats over the 30 year Permit, which includes no more than 26 Indiana bats in any consecutive 5-year period, or 14.2 Indiana bats in any one year. Those analyses are herein incorporated by reference. Site-specific data gathered by Buckeye Wind, and predictive modeling conducted by Buckeye Wind supports the results presented in the HCP. The Service concurs with Buckeye Wind's assessment of Project impact because the Buckeye Wind HCP's fatality estimates are based on the best available scientific information on the expected amount of Indiana bat take.

#### *Mitigation*

Mitigation activities will involve permanent preservation of 217.0 acres of suitable Indiana bat swarming habitat within seven miles of a P2 hibernaculum in Ohio. Within the mitigation areas, travel corridors can be restored and habitat can be enhanced through ensuring an

adequate number of suitable roost trees and managing woody invasive species. Over the life of the Permit, proposed mitigation is expected to have a net beneficial effect on Indiana bats. The permanent protection of swarming habitat will help enhance reproductive success and increase the survival probability of the Indiana bats that have overwintered in the hibernaculum by preserving foraging and roosting habitat critical to bats with depleted nutritional stores.

A second mitigation option entails buying credits from a Service-approved Indiana bat mitigation bank whose geographic service area includes the Project. If the mitigation bank has established a ratio of Indiana bat habitat acres to offset the impact of Indiana bat take, and such ratio is approved by the Service, then that ratio will be used to calculate the habitat mitigation required at the bank for the Buckeye Wind Project. If the mitigation bank has not established such a relationship, Buckeye Wind, ODNR DOW and the Service may agree upon a number of acres within the mitigation bank that could be used to fulfill the remainder of the mitigation obligation to offset the impacts of take by the Project.

Preservation and enhancement of land within 11.2 km (7 mi) of a P2 Indiana bat hibernaculum in OH will protect valuable fall roosting, foraging, and swarming habitat. Migration is an energetically expensive undertaking (Fleming and Eby 2003), and bats therefore require roosting and foraging opportunities outside hibernacula in order to increase fat stores prior to hibernation. Entering hibernation with ample energy reserves is key to surviving winter hibernation for all bats, and for adult females it is critical for ovulation (Humphries et al. 2003, Jonasson and Willis 2011, Kunz et al. 1998) and may be especially critical for overwinter survival in the face of WNS. Increasing opportunities for juveniles to build up energy stores prior to their first winter hibernation has the potential to increase survivorship (Jonasson and Willis 2011). As a result of the recognized importance of habitat around hibernacula, 1 of the 4 broad components of the recovery plan (Service 2007) is the “conservation and management of habitat (hibernacula, swarming and, to a degree, summer).”

The mitigation habitat would also be suitable for use during the summer for Indiana bats that remain near the hibernaculum and for Indiana bats that potentially migrate to the area from other hibernacula. Males and non-reproductive females can remain close to hibernacula during the active period, roosting in nearby trees (Brack 1983, Gardner and Cook 2002, Service 2007, Whitaker and Brack 2002). As described in the HCP, the mitigation land must support characteristics of suitable maternity colony summer habitat, so reproductively active females may also benefit from the habitat preservation, enhancement and restoration.

The first phase of mitigation will offset the take of the first 10 years of operation. This will be accomplished no later than 1 year after the beginning of operation. These benefits are

expected to be realized from the time of implementation throughout the life of the Project and beyond. The second phase of mitigation will offset the take of the last 15 years of operation. This will be accomplished no later than 1 year after the beginning of the 11th year of commercial operation. These benefits are expected to be realized from the time of implementation (Year 11) throughout the life of the Project and beyond.

*Summary of the Effects of the Action on the Indiana bat*

The following summary of the Effects of the Action on the Indiana bat is taken from the Service's BO (Service 2013b), and the BO is hereby incorporated by reference.

Based on the 25-year project operation, the total number of Indiana bats to be taken under the ITP term is 130.0 (5.2 bats/yr x 25 years = 130). If WNS reduces the Midwest RU population by 50% of 2011 pre-WNS mortality estimates at any point during the permit term, then the take number will be less than 130 Indiana bats. In order to assess the biological significance of this amount of Indiana bat mortality, many factors must be considered, such as the species life history strategy, its sensitivity to change, resilience (ability to recover after a disturbance), and recovery rate (progress towards recovery over time). Similar to most other bat species, Indiana bats exhibit a low birth rate, long life span, and naturally low mortality rate. We must also take into consideration the fact that WNS has arrived relatively recently (winter of 2010-2011) within the Midwest RU, and so mortality attributed to this devastating disease has yet to peak within populations of Indiana bats likely to be affected by the Project. Further, the Midwest RU has experienced a delay in post-WNS population declines, compared to those seen in the Northeast RU—after 3 years of WNS the Midwest RU remains stable. The Appalachian RU did not show RU-wide declines until six years post-WNS (45% decline observed in year 6 of WNS). Therefore, it is prudent to complete biological significance of take analyses employing post-WNS population scenarios using the most current scientific information available regarding WNS decline rates and timeframes. As stated previously, WNS has caused a significant decline in Indiana bat populations, especially in the Northeast RU (Thogmartin et al. 2012), and may have a similar effect on Indiana bats within the Midwest RU in the next few years.

Thogmartin et al. (2013) recently published an article describing a stochastic, stage-based population model developed to forecast the population dynamics of the Indiana bat, subject to WNS. The model explicitly incorporates environmental variability in survival and reproduction rates and demographic stochasticity. The model considers only the female portion of the population because of the polygynous nature of the species. It assumes individual wintering populations are closed (no immigration or emigration).

We used the Thogmartin et al. model to assess the impact of the anticipated take of Indiana bats at 2 levels: 1) maternity colony level (local colonies within the Action Area and colonies that migrate through the Action Area); and, 2) winter colony level. We also considered the impact of the take of Indiana bats at the Recovery Unit level. But based on the results of the analysis at the maternity colony and winter colony levels, we were able to conclude our analysis at the RU level without use of the Thogmartin et al. (2013) model.

To use the Thogmartin et al. model, we must evaluate only the take of adult females, therefore the annual expected take of 5.2 Indiana bats per year and the maximum take limit of 14.2 Indiana bats per year must be parsed out into the proportion that is comprised of adult females. To do this, we look at several factors. As with all-bat mortality, *Myotis* spp. mortality at wind facilities has been shown to vary by season, with 8%, 34%, and 58% of mortality occurring in the spring, summer, and fall, respectively<sup>1</sup>. Proportion of females in the population also varies by season, with females comprising 92% of all Indiana bat captures during the summers of 2008-2009 within the tri-county area (Stantec 2010). Female Indiana bats are more likely to migrate farther distances than male Indiana bats (Service 2007). The Collision Risk Model (Stantec 2010) describes how the maximum migratory distance and negative linear relationship with increasing distance away from the hibernaculum of origin was used to estimate proportion of the migrating population that was male and female, with females comprising approximately 73% of the migratory individuals. The take calculations in the HCP also added in the take of one unborn or non-volant Indiana bat for each adult female Indiana bat estimated to be taken during spring and summer. Therefore take estimate of females during spring and summer must be divided by 2 to account for this. For the purposes of evaluating the impact to local maternity colonies, all adult female take that occurs in the summer is assumed to come from bats from the local maternity colonies. The local female population comprises 14% of the total migratory female population; therefore 14% of the migratory female mortality is attributed to the local maternity colonies. The remaining 86% of adult-female mortality that occurs during spring and fall is attributed to maternity colonies outside of the Action Area.

We developed “Baseline” scenarios for each of the following population segments: local maternity colonies, migratory maternity colonies, and winter colonies, for comparison with take scenarios.

The Baseline scenarios modeled the population trajectory with WNS using the Northeast RU WNS lambda values applied immediately. This is protective of the Indiana bat because WNS has been documented in the Midwest RU for several years, and the Midwest RU

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Using 7 studies within the range of the Indiana bat, that conducted monitoring spring through fall, and reported on dates and species composition of fatalities. With seasons defined as: Spring: April 1- May 30; Summer: June 1- July 31; and, Fall: August 1- November 30.

population of Indiana bats is expected to respond to WNS in a similar manner to the Northeast RU, and see significant population declines over the next few years. However, we know that this scenario is extremely unlikely because if the Midwest RU was following the Northeast RU pattern completely, the Midwest RU population should have experienced substantial declines already. Instead it has remained stable for 3 years post-WNS. Based on 3 years of observation in the Midwest RU, it appears that WNS is not following the same pattern as in the Northeast RU. At minimum, it appears the timing of effect is slower than observed in the Northeast. However, there is too little data available for the Midwest RU yet and we are unable to determine a Midwest RU-specific WNS lambda value, so we applied the WNS lambda values from the Northeast starting in Year 1 of the project to project the maximum impact that WNS (and hence, project related take) could have on the population being analyzed.

Further, we believe that take is commensurate with population size in the Midwest RU (as population size decreases, so too will take, as the take estimates are driven by population size). The model results show that under Northeast RU lambda values, the population size will decline drastically and quickly. Thus, the take anticipated will not occur if WNS plays out as indicated in the Northeast RU. Additionally, under the HCP, the Applicant will reduce take by 50% if the Midwest RU population declines by 50%. Using the Northeast RU rates, this decline will occur early on, if not at the outset, of the project. So, again, if we assume the Northeast RU pattern holds in the Midwest RU, the take anticipated will be greatly less than that analyzed in this scenario.

Nonetheless, we ran the model assuming Northeast RU WNS lambda values and the full take amounts (5.2 bats per year for 25 years, not reduced regardless of population size). This is the most conservative scenario because it assumes full take allowable under the ITP with the most severe WNS rates applied over the fastest timeframe.

Using these assumptions, 2 of 6 scenarios (local maternity colony Expected Take and Worst-case Take scenarios) caused population reductions of more than 5% in 1 or more metric (probability of extinction, median time to extinction, and median ending lambda after 50 years). To further understand the effect of the project for these 2 scenarios, we re-ran the model assuming a different set of more realistic assumptions for these 2 scenarios.

For the local maternity colonies we developed a more realistic Baseline scenario, based on what we have observed to date in the Midwest RU and the WNS impacts we expect to see over the next few years. WNS has been present in the Midwest RU for 3 years but the Midwest RU population remains stable. We assumed the Midwest RU would follow a similar delay in WNS-population declines as the Appalachian RU did—the Appalachian RU did not show WNS-declines until year 6 of WNS. Since WNS was observed in the Midwest

RU during the winter of 2010-2011, we assigned that to be Year 1 of WNS. Year 6 of WNS would be 2016, which is 3 years from now. Therefore in the Baseline model scenario for local maternity colonies, we applied a delay of 3 years to when WNS lambda values were applied to the Midwest RU. After 3 years of non-WNS lambda values, we then applied the WNS lambda values derived from the Northeast RU in the same manner as the other baseline scenarios. Further, we allotted the full take amount in the first 5 years (5.2 bats per year for 25 years), and then for the remaining 20 years, assumed that WNS had reduced the population by 50% and that take would also be reduced by 50%.

An Expected Take scenario and Worst-case Take scenario were devised for each of the 3 populations (local maternity colonies, migratory maternity colonies, and winter colonies), yielding 6 modeled scenarios for comparison to the baseline scenarios. These populations are not mutually exclusive in that the maternity colonies, winter colonies, and Recovery Unit contain some of the same individuals. But the impacts of the loss of those individuals at the various levels may be different, so the impact at each level is analyzed.

The Expected scenarios were derived using the “Expected” take number of 5.2 Indiana bats per year. Using the take estimate generated in Section 5.1.2.5.3 of the HCP, we then determine what proportion of that take are adult female bats, and which populations they originate from (i.e., local maternity colonies inside the Action Area or colonies outside of the Action Area but migrating through it), and apply that same female take quantity each year over the 25 year operation of the facility.

The Worst-case Take scenarios were derived by assuming that all of the 5-year take limit would be used as quickly as possible. The “worst case” scenarios could occur during the first few years of Project operation, when the adaptive management program is first being used to refine the cut-in speed and feathering regime to maintain take at or below permitted levels. The maximum estimated take of 14.2 Indiana bats per year was applied in Year 1, then the remaining take of 11.8 Indiana bats was applied in Year 2. Years 3-5 would necessarily have 0 take, to maintain compliance with an ITP which allots take of not more than 26 Indiana bats over a consecutive 5 year period, starting in any one year in which take of more than 5.2 Indiana bats is estimated to have occurred. After 5 years of operation, we assume that adaptive management would have resulted in a cut-in speed and feathering regime that maintains take at or below “expected” take numbers of 5.2 Indiana bats per year. We calculate the maximum number of adult females that could be taken in Years 1 and 2 based on those maximum take numbers. We assume 0 take in Years 3-5, and then assume “expected take” in Years 6-25. We then estimated which populations the females originate from (local maternity colonies inside the Action Area or colonies outside of the Action Area but migrating through it), and apply the calculated take over the 25 year operation of the facility.

For all modeled scenarios, the following parameters apply: we use Indiana bat post-WNS population mortality rates derived from the Northeast RU; we apply the project take over a 25-year period, and model the population out to 50 years; we model only the female portion of the population; and, all take from the project is additive on top of other mortality (e.g., mortality from WNS).

For each modeled scenario (Scenarios 1A-1C, 2A-2C, and 3A-3C), we ran 5,000 model simulations and we summarized the median model simulation results for the following metrics: probability of extinction, median time to extinction, and median ending lambda after 50 years (see Table 22 in BO). We compare the results of the baseline scenarios of each population unit (1A, 2A, and 3A) with the Expected Take and Worst-case Take results scenarios of each population unit (1B and 1C, 2B and 2C, and 3B and 3C). If there is an appreciable difference (e.g. loosely defined as greater than 5%) in the results between the baseline and any of the take scenarios for any of the population units, we completed an analysis of the how these population-level impacts will impact the likelihood of survival and recovery of the Indiana bat at the RU level.

The model results indicated that none of the Expected Take or Worst-case Take scenarios resulted in appreciable reductions relative to the Baseline scenario in any of the metrics. Therefore, appreciable reductions in the fitness of the local maternity colonies, migratory maternity colonies, and winter populations to which the taken individuals belong are unlikely.

Further, because there was no appreciable reduction in the fitness of the maternity colonies or winter populations to which the taken individuals belong, there would also be no appreciable impact on the Midwest RU or on the Indiana bat population range-wide.

## **V. Public comment period and comments received**

The Service determined that this Project warranted an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) (42 U.S.C. §4321 et seq.). Public scoping was first initiated in the form of an NOI to conduct a 30-day scoping period for a NEPA decision on the proposed HCP and Permit and request for comments, published in the Federal Register on January 29, 2010 (75 FR 4840). Formal scoping began for the NEPA analysis on May 26, 2010 when the NOI to prepare a DEIS was published in the Federal Register (75 FR 29575). The Service also conducted outreach by press releases and public notification to inform interested parties or those potentially affected by the Proposed Action and to request comments on the scope of the NEPA analysis. Comments resulted in the identification of a number of issues related to the Project and the associated HCP. A total of 14 written or verbal comments were submitted during both scoping comment periods identifying issues and concerns about the Proposed Action and the preparation of the EIS.

Comments were received via phone, voicemail, electronic mail, and hardcopy mail and are indexed and summarized in Appendix C to the EIS. These comments were carefully reviewed and categorized into the issues that informed the analysis for the EIS.

During the EIS development, Service and the Applicant consulted with the Ohio Historic Preservation Office (OHPO) and tribes in conjunction with obligations to fulfill requirements under NEPA, Section 106 of the National Historic Preservation Act (16 U.S.C. §§ 470a to 470w-6), and the American Indian Religious Freedom Act (42 U.S.C. §1996 et seq.). All organizations identified as potential consulting parties under these cultural statutes and regulations were contacted by letter, and follow-up phone calls, emails, and personal meetings, as necessary. The Federally-recognized Eastern Shawnee Tribe of Oklahoma and the state-recognized Piqua Shawnee Tribe indicated an interest in the Project and consultation with these tribes has been completed. Section 106 consultation with the Ohio Historic Preservation Office was concluded with a Programmatic Agreement.

The Draft EIS, Draft HCP, and Draft Implementing Agreement were published in the Federal Register for public review on June 29, 2012 (77 FR 38819) in accordance with requirements set forth in the NEPA and its implementing regulations (40 CFR 1500-1508). Public comments were accepted during a 90-day period following publication of the Federal Register Notice of Availability. One public information meeting was held during the comment period, on July 12, 2012 in Urbana, Ohio. One hundred three comments were received and were taken into account in assessing Project impacts and potential mitigation and resulted in some modifications in the EIS and HCP. Responses to substantive comments on the Draft EIS and Draft HCP can be found in Appendix K of the Final EIS and are incorporated herein by reference.

The Final EIS, HCP, and Implementing Agreement and the Draft Programmatic Agreement were published in the Federal Register for review and comment on April 19, 2013, for a 30 day comment period. Comments were received from 10 individuals/organizations. Comments and responses are itemized in Appendix A of the Service's Record of Decision.

## **VI. Incidental Take Permit Criteria—Analysis and Findings**

Section 10(a)(2)(A) of the ESA specifically mandates that "no Permit may be issued by the Secretary authorizing any taking referred to in paragraph (1)(B) unless the Permittee therefore submits to the Secretary a conservation plan that specifies-(i) the impact which will likely result from such taking; (ii) what steps the Permit will take to minimize and mitigate such impacts, and the funding that will be available to implement such steps; (iii) what alternative actions to such taking the Permittee considered and the reasons why such

alternatives are not being utilized; and (iv) such other measures as the Secretary may requires as being necessary or appropriate for the purposes of the plan."

Section 10(a)(2)(B) of the ESA mandates that the Secretary shall issue a Permit if he finds "...after opportunity for public comment, with respect to a Permit application and the related conservation plan that -(i) the taking will be incidental; (ii) the Permittee will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the Permittee will assure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of survival and recovery of species in the wild; and (v) the measures, if any, required under subparagraph (A)(iv) will be met; and he has received such other assurances as he may require that the plan will be implemented ..."

In accordance with 16 U.S.C. § 1539(a)(2)(B), the Service makes the following findings:

a. The taking is incidental

The Service finds that the requested take by Buckeye Wind is incidental to and not the purpose of the activities associated with constructing and operating a wind power project. The covered activities are associated with construction, operation, maintenance, decommissioning, mitigation, and monitoring of the Buckeye Wind Project within the identified covered lands, as described above. Take of Indiana bats resulting from the operation of the wind facility, and any habitat loss due to construction, maintenance, and decommissioning will be incidental to, and not the purpose of, these lawful activities.

b. The taking has been minimized and mitigated to the maximum extent practicable

The issuance criterion of, "minimize and mitigate to the maximum extent practicable" requires the Service to examine and predict the efficacy of the applicant's proposed minimization and mitigation measures. Impacts to the species (or listed entity) of the proposed taking that are not avoided or eliminated as a result of project and HCP planning must be minimized to the maximum extent practicable. Any remaining impacts must then be mitigated (e.g., "offset" or "rectified") to the maximum extent practicable.

These standards are based in (1) a biological determination of the impacts of the taking as anticipated in the proposed project; (2) what would further minimize those impacts; (3) and what would biologically compensate for those remaining impacts. It is the Service's obligation to provide or approve a biologically based suite of avoidance, minimization and mitigation options that allow the applicant to fully neutralize and/or compensate for the impacts of the taking. If the applicant provides these minimization measures and mitigation

measures that are fully commensurate with the level of impacts, then it has met that issuance criterion and detailed discussion of “practicability” is not required.

The Service finds that Buckeye Wind will minimize and mitigate the impacts of take on the Indiana bat to the maximum extent practicable. The company has developed the HCP and IA pursuant to the incidental take permit requirements codified at 50 CFR 17.22(b)(1) and 50 CFR 17.32(b)(1). Under the provisions of the HCP the impacts of take will be minimized, mitigated, and monitored in accordance with the HCP and requirements of Permit #TE66315A through the following measures:

The HCP applies a biologically-based approach to minimizing take using avoidance measures proven to be effective at reducing bat mortality at wind farms across the Eastern and Midwestern U.S., namely the use of feathering and cut-in speeds. Further, the Applicant uses siting of turbines to minimize the risk of exposure; At least 63% of turbines will be sited in the lowest quality habitat. The Applicant avoided siting turbines within 2.9 km (1.8 mi) of documented maternity roost trees. The applicant then applied the strictest operational protocols (cut-in speeds) to turbines in the highest quality habitat areas and during the seasonal periods of highest risk, thereby providing avoidance measures that are commensurate with potential risk to Indiana bats. Further, Indiana bats may move across the landscape over the 30 year operational life of the Project therefore the cut-in speeds are assigned to all turbines within the Action Area based on habitat quality, regardless of whether Indiana bats have been detected nearby.

To make the finding that the conservation measures included in the HCP minimize and mitigate the impacts of take to the maximum extent practicable, the Service must first evaluate whether the conservation measures are rationally related to the level of take anticipated under the plan. In effect, the minimization and mitigation measures need to address the biological needs of the Covered Species in a manner that is commensurate with the impacts to the species anticipated under the HCP. The Service believes the amount of minimization and mitigation provided for in the HCP compensates for the impacts of take of Indiana bats that will or could potentially occur under the plan. The primary form of take of Indiana bats anticipated under the HCP is harm in the form of mortality resulting from operation of the wind turbines. The HCP estimates that use of feathering and cut-in speeds will reduce Indiana bat mortality by at least 68.3%, compared to Project operation without feathering and cut-in speeds. The take request of not more than 26 Indiana bats over any consecutive 5-year period reflects this 68.3% reduction in take. Buckeye Wind has also proposed to reduce take by 50%, should the Midwest RU Indiana bat population decline by 50% due to WNS during the Permit term. This further reduction is equivalent to a total of 84% reduction in expected take, compared to project operation without feathering and cut-in speeds.

The HCP includes a rigorous mortality monitoring protocol, coupled with a feedback loop of adaptive management if specified mortality triggers are met, either in real time, or at the end of each monitoring year. The monitoring and adaptive management plans address uncertainty inherent in modeling estimates of take numbers and habitat use. Monitoring and adaptive management will monitor the effectiveness of the conservation program over the life of the Permit. Further the HCP includes research on Indiana bat and wind interactions as a conservation measure that will help inform operation and reduce take at the Buckeye Wind Project as well as other wind projects within the range of the Indiana bat.

Buckeye Wind has proposed a mitigation plan designed to fully offset the impacts of the taking. The permanent protection of swarming habitat will enhance reproductive success and increase the survival probability of Indiana bats that have overwintered in the hibernaculum by preserving, restoring, and enhancing foraging and roosting habitat critical to bats with depleted nutritional stores. The mitigation land must support characteristics of suitable maternity colony summer habitat, so reproductively active females may also benefit from the mitigation land. The land will be protected in perpetuity, providing benefits to the Indiana bat beyond the Permit term.

The Buckeye Wind HCP, including its minimization and mitigation measures, fully compensates for impacts of the take to the covered species. We have determined that the implementation of the conservation program by Buckeye Wind will not disrupt, in any way, implementation of our Recovery Program for the Indiana bat. In fact, there are a number of examples where we believe the Buckeye Wind conservation program will assist in recovery of the species.

The mitigation plan will permanently protect 217 acres of habitat within 7 miles of a Priority 2 hibernaculum in Ohio. The mitigation will protect, enhance and restore swarming habitat and potential maternity habitat, clearly consistent with one of the broad components of the recovery plan (Service 2007): “conservation and management of habitat (hibernacula, swarming and, to a degree, summer).” The research to be implemented as a conservation measure will further aid in minimizing future take of Indiana bats at wind power projects, contributing to survival and recovery of the species.

The Service finds that the HCP minimizes and mitigates the impacts of take of the Covered Species to the maximum extent practicable, based on the information provided above because: (1) the HCP's minimization and mitigation measures effectively compensate for the impacts of take under the plan; (2) the plan provides for adaptive management to adjust to changing conditions and adjusts mitigation costs over the life of the plan to fully fund its implementation.

c. Ensuring adequate funding and addresses unforeseen circumstances

Buckeye Wind warrants that it has, and will expend, the funds identified in Chapter 6 of the HCP, as such funds may be necessary to fulfill its obligations under the HCP. If such funding is not sufficient to provide the necessary conservation, Buckeye Wind shall nonetheless be responsible for ensuring that the necessary mitigation and monitoring is completed. Buckeye Wind shall also provide assurance of adequate funding in the form of a Surety in the amount of \$1,619,200 for Stage 1 mitigation, monitoring, changed circumstances and contingency funds prior to beginning Project operation. Buckeye Wind shall provide a Surety in the amount of \$1,607,100 (plus adjustments for inflation) for Stage 2 mitigation, monitoring, changed circumstances and contingency funds prior to the beginning of the 11<sup>th</sup> year of Project operation. Buckeye Wind shall promptly notify the Service of any material change in their financial ability to fulfill the obligations outlined in the Buckeye Wind HCP.

Pursuant to the Service's "No Surprises" regulations (50 CFR 17.22(b)(5) and 17.32(b)(5)), the HCP includes reasonable and appropriate procedures to address unforeseen circumstances. In the event of unforeseen circumstances affecting the Indiana bat, Buckeye Wind will not be required to provide additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon for the species covered by the HCP without their consent and provided that proper implementation of the HCP has occurred.

d. Jeopardy analysis

Implementing regulations for section 7 of the ESA (50 CFR 402) defines "jeopardize the continued existence of" as, "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."

Jeopardy determinations for Indiana bats are made at the scale of the listed entity, which is the range wide distribution of the species (32 FR 4001). The jeopardy analysis follows a hierarchal relationship between units of analysis that characterize effects at the lowest level or smallest scale, and then aggregated to the highest level or largest scale of analysis.

As described in the *Summary of the Effects of the action on the Indiana bat* section in this document, we anticipate the lethal take of 130 Indiana bats in the action area over the 30-year term of the ITP. Further, we anticipate a portion of the take will consist of bats summering within the Action Area, and a portion of the take will be composed of bats summering within the migratory range of, but outside of the Action Area. Adult and juvenile males and females

will be taken by the Project. The analysis above demonstrates how loss of females and their reproductive capacity will affect the maternity colonies to which they belong as well as their wintering populations.

Using the Thogmartin model (Thogmartin et al. 2013) we have demonstrated the results of Expected Take and Worst-case Take scenarios compared to baseline scenarios without take on the local maternity colonies within the Action Area, maternity colonies within the migratory range of the Action Area, and wintering populations. We have demonstrated that the impact of the taking on these populations is not likely to appreciably reduce the likelihood of survival and recovery compared to the baseline condition.

Given that implementation of this Project is not likely to appreciably reduce the fitness of Indiana bat maternity colonies or wintering populations, the Project is also unlikely to reduce appreciably the likelihood of survival and recovery of Indiana bats at the Midwest RU and range-wide scales.

In addition to the Effects from the proposed action, the implementing regulations require us to evaluate the effects of the action (above) taken together with 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 under section 7 of the Act.

The Service is not aware of any non-Federal activities that would affect Indiana bat habitat that are planned within the Action Area. The Service contacted the Champaign County Chamber of Commerce to determine if there are any proposed commercial, industrial, or residential developments within the Townships of the Action Area (Goshen, Rush, Salem, Wayne, Union, and Urbana). The Chamber of Commerce and County Commissioners responded that they are not aware of any proposed developments of this type within the Townships of the Action Area (Sandi Arnold, Champaign County Chamber of Commerce, personal communication).

Though we have not identified any proposed developments that would affect Indiana bat habitat, we anticipate that occasional tree/snag removal or timber harvesting by non-Federal entities on private land may take place occasionally within the Action Area. A search of the Champaign County Auditor's webpage for properties between 2 and 10,000 acres that were zoned for "timber" within the townships of the Action Area yielded 15 properties totaling 131 ha (323 ac). Timbering on these areas could harm or harass individual Indiana bats that inhabit the impacted area, depending on the acreage of trees cleared, the proximity of the impacts to maternity colonies, and the time of year that tree clearing occurs. However within

the Action Area there are 9,846.4 ha (24,331 ac) of suitable habitat, so the total habitat impacted by timbering operations is only about 1.3 percent of the total habitat available.

These impacts would not significantly impact the quantity or distribution of suitable habitat in the Action Area as a whole, and would not rise to the level of causing population-level impacts.

Most land in the Action Area is privately owned and used for agricultural purposes. Additional single family residences, out buildings, and other small scale development may also occur within the Action Area during the life of the Project. No quantification of the number or location of these activities is available. It is possible that tree harvest associated with these activities could harm or harass individual Indiana bats that inhabit the impacted area, depending on the acreage of trees cleared, the proximity of the impacts to maternity colonies, and the time of year that tree clearing occurs. However, the scale of these types of projects would not result in habitat loss on a scale that would significantly impact the quantity or distribution of suitable habitat within the Action Area and would not rise to the level of causing population-level impacts. Standard farming practices would not result in effects to Indiana bat or suitable habitat.

During 2008-2009, one other wind power facility was proposed by a separate wind company with a project area that overlapped with the Action Area. Subsequently, Buckeye Wind purchased the land leases from that wind company, for inclusion into the Buckeye Wind Project. Therefore the other wind power project is no longer proposed. The Service is not aware of any other proposed wind power projects within the Action Area.

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 remaining patches of Indiana bat 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.

Thus, after reviewing the current status of Indiana bats, the environmental baseline for the action area, the effects of the proposed action and the Applicant's implementation of the HCP, and the cumulative effects, it is the Service's biological opinion that the actions as proposed, are not likely to jeopardize the continued existence of Indiana bats.

- e. Other measures the Secretary deems necessary

The Service finds that all additional measures required by the Service as necessary or appropriate for the HCP are included in the HCP, IA, the Permit and by extension the BO. In

particular, the IA, an agreement between the Service and Buckeye Wind that governs implementation of the HCP, binds the Permittee to fully implement and fund the HCP.

f. Assurances

The Service finds that the HCP and IA provide the necessary assurances that the plan will be carried out by Buckeye Wind. By accepting the Permit Buckeye Wind is bound to fully implement the provisions of the HCP in accordance with the IA as well as the terms and conditions of the Biological Opinion.

**VII. General Criteria and Disqualifying Factors**

The Service has no evidence that the Permit application should be denied on the basis of the criteria and conditions set forth in 50 CFR 13.21(b) - (c).

**VIII. Recommendations on Permit Issuance**

Based on the foregoing findings with respect to the proposed action, I recommend approval of the issuance of Permit Number #TE66315A in accordance with the Buckeye Wind HCP and its supporting IA.

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