Comments on NOI Indiana Bat 30-Day Scoping Period, 75 Fed. Reg. 4840
Conservation Law Center (contact J. B. Hyman, jbhyman@indiana.edu)
March 1, 2010

Ms. Megan Seymour
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Sent via e-mail to EverPowerHCP@fws.gov (receipt verification requested)

Dear Ms. Seymour,

We offer these comments pursuant to the Service's Notice of Intent ("NOI") to conduct a 30-day scoping period for a National Environmental Policy Act ("NEPA") decision on a proposed incidental take permit ("ITP") and habitat conservation plan ("HCP") for the EverPower Wind Power project (the "Project") in Champaign County, Ohio. The Conservation Law Center is a nonprofit public interest law firm located in Bloomington, Indiana. Our mission is to help clients solve natural resources conservation problems, work to improve the body of conservation law and policy, and educate second and third year law students.

We focus our comments on issue (6) set forth in the Service's NOI: "the appropriate level of NEPA review, specifically whether development of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) would be appropriate." In the course of these comments we will also refer to publications containing "relevant data concerning wind power and bat interactions" (NOI, issue (2)).

According to the Service's NOI, the Project would be spread across 80,370 acres, and would include installation of up to 100 wind turbines and associated collection lines, access roads, utility lines, substations, operation and maintenance facility buildings, and temporary staging areas and concrete batch plants. Access roads to the turbines would have a temporary width of up to 55 feet during construction, and a permanent width of 16-20 feet. The Service anticipates impacts to wildlife, particularly birds and bats.

EverPower Wind Holdings, Inc., in conjunction with the Service, has determined that "take" of Indiana bats is likely to occur from development of the proposed Project. EverPower plans to develop an HCP and request issuance of an ITP from the Service, thus invoking the requirements of NEPA.

THIS REQUEST FOR AN ITP REQUIRES AN EIS UNDER NEPA

An EIS (rather than an EA) is required where a major federal action significantly affects the quality of the human environment.[1] There is no doubt that an ITP to take endangered Indiana bats is a major federal action and affects the quality of the environment. The relevant issue here is whether the effects of the Project are "likely to be significant" – that is, whether significant environmental effects may or will occur.[2] If there is a substantial question whether an action may have a significant effect on the environment, then the agency must prepare an EIS.[3]

In contrast to an EIS, an EA is a document that, under NEPA, (1) provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact; (2) aids an agency's compliance with NEPA when no EIS is necessary; and (3) facilitates preparation of an EIS when one is necessary.[4] An EA is a "less formal and less rigorous" document than an EIS.[5]

The inquiry into whether an action may "significantly affect" the environment, and thus whether an EIS is necessary, requires consideration of "context" and "intensity."[6] "Context" delimits the scope of the agency's action, including the interests affected.[7] "Intensity" refers to the severity of impact. 40 C.F.R. §1508.27(b) provides that the agency should consider the following factors when evaluating intensity:

(1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
(2) The degree to which the proposed action affects public health or safety.

[1] 40 C.F.R. §1502.3.
[2] *See* Council on Environmental Quality, *A Citizen's Guide to the NEPA*, (December, 2007), flow chart on page 8.
[3] *Ctr. for Biological Diversity v. National Highway Traffic Safety Admin.*, 538 F.3d 1172, 1185 (9th Cir. 2008) (citing *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998)).
[4] 40 C.F.R. §1508.9(a).
[5] *Nat'l Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 728 (9th Cir.2001) (holding that the National Parks Service acted capriciously by preparing an EA rather than an EIS in case of plan to increase the number of cruise ships entering Glacier Bay).
[6] 40 C.F.R. §1508.27.
[7] *Nat'l Parks*, 241 F.3d at 731.

(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.
(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.
(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The factors most relevant to this Project and ITP are factors (5), (6), (7), and (9). Accordingly, in these comments we focus on four questions corresponding to these factors:

A. §1508.27(b)(5): Will an EIS be necessary to sufficiently address uncertainties regarding impacts and possible mitigation measures?
B. §1508.27(b)(6): Will this NEPA analysis set a precedent for other NEPA analyses?
C. §1508.27(b)(7): Will the incremental impact of the Project's impacts, when added to the aggregate threats to Indiana bats, be significant?
D. §1508.27(b)(9): Does the fact that the Project will likely take endangered Indiana bats make this a significant impact?

The Ninth Circuit has held that any one of the ten factors may be sufficient to require preparation of an EIS in appropriate circumstances.[8] We argue in these comments that consideration of the

[8] *See Ocean Advocates v. Army Corps of Engineers*, 402 F.3d 846, 865 (9th Cir. 2004) (holding that the Army Corps of Engineers acted capriciously by preparing an EA rather than an EIS in case of plan to build an addition to an existing oil refinery dock); *Nat'l Parks*, 241 F.3d at 731.

four factors above leads to the conclusion that the Project is likely to "significantly affect" the Indiana bat and that an EIS is required prior to issuance of an ITP.

There is growing concern at the Service and in the scientific community regarding the potential for bat kills and population declines given the rapid proliferation of wind power facilities and the large-scale mortality that has occurred at some facilities.[9] Limited knowledge of migration and other movement behaviors of Indiana bats (and indeed of bats in general) and of behavioral responses of bats to landscape changes and turbine design and operation limits the Service's ability to understand interactions between Indiana bats and wind power facilities. The impacts of Project alternatives, the effectiveness of mitigation measures, and the cumulative impacts of the numerous threats to Indiana bats throughout their range are highly uncertain and must be evaluated using the best available data, reasonably obtainable new data developed for this Project, and risk assessments. These evaluations require the in-depth analysis of an EIS.

A. 40 C.F.R. §1508.27(B)(5): THE DEGREE TO WHICH THE POSSIBLE EFFECTS ARE HIGHLY UNCERTAIN OR INVOLVE UNIQUE OR UNKNOWN RISKS. *WILL AN EIS BE NECESSARY TO SUFFICIENTLY ADDRESS UNCERTAINTIES IN IMPACTS AND POSSIBLE MITIGATION MEASURES*?

The impacts of the proposed Project on Indiana bats and the effectiveness of possible mitigation measures are both highly uncertain. An agency must prepare an EIS where possible effects are "highly uncertain or involve unique or unknown risks."[10] "Preparation of an EIS is mandated where uncertainty may be resolved by further collection of data . . . or where the collection of such data may prevent speculation on potential effects. . . . [t]he purpose of an EIS is to obviate the need for speculation by insuring that available data are gathered and analyzed prior to the implementation of the proposed action."[11] "Lack of knowledge does not excuse the preparation of an EIS; rather it requires the agency to do the necessary work to obtain it."[12] For example, in *Humane Society v. Dept. of Commerce*, the agency produced an EA on the effects of

[9] *See, e.g.*, USFWS, Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision, April 2007, Dept. of Interior, page 101.
[10] 40 C.F.R. §1508.27(b)(5).
[11] *Nat'l Parks*, 241 F.3d at 732 (quoting *Sierra Club v. United States Forest Serv*., 843 F.2d 1190, 1195 (9th Cir. 1988) [internal punctuation omitted].
[12] *Nat'l Parks*, 241 F.3d at 733 [internal punctuation omitted]. *See also Anglers of the Au Sable v. USFS*, 565 F. Supp. 2d 812, 824 (E.D. Mich. 2008) (holding that the USFS incorrectly assessed the intensity of impact of a proposed drilling project).

authorizing permits for research on threatened and endangered populations of Steller sea lions.[13] The district court concluded that although the agency made numerous citations in the EA to the action's uncertain effects and unknown risks it did not analyze the uncertainties or seek to fill information gaps. The court explained,

> The EA, in fact, is replete with references to the uncertainty inherent in the program, recognizing that "[t]here have been no studies dedicated to documenting and assessing the effects of research on Steller sea lion stocks or populations" and that "[t]he cumulative effects of various research activities on Steller sea lions, including the possibility of cumulative effects that may not become evident for some time, are uncertain." . . . Given the EA's candid recognition of these uncertainties, defendants' contention that the agency took a "hard look" at the issue by considering available studies and adopting various measures to mitigate the research's impact must be rejected.[14]

The following bulleted list highlights uncertainties regarding the local impacts of the Project on the Indiana bat. Several of these information gaps can be filled within the time frame of an EIS and all of the gaps should be analyzed in detail within an EIS.

- uncertainty about Indiana bat habitat needs and use;
- uncertainty about how many Indiana bats will be killed by the Project's wind turbines over the next several decades;
- uncertainty about the relationship between local features of the Project site and Indiana bat mortality at that site;
- uncertainty about the technical specifications of the facility and bat mortality at the site;
- uncertainty about the impacts of the Project on Indiana bat migration and summer habitat degradation;
- uncertainty about the ability of possible mitigation and minimization strategies to compensate for the loss of bat individuals and reproductive potential.

In addition, the following bulleted list highlights uncertainties regarding the cumulative impacts on the Indiana bat. Some of these information gaps can be filled within the time frame of an EIS and all of the gaps should be analyzed in detail within an EIS.

[13] *Humane Society v. Dept. of Commerce*, 432 F. Supp. 2d 4, 20-21 (D.D.C. 2006) (holding that NMFS violated NEPA by preparing an EA rather than an EIS in case of issuance and amendment of various permits that authorized research on threatened and endangered populations of Steller sea lions) (citation to record omitted).
[14] *Humane Society*, 432 F. Supp. 2d at 20-21 (citation to record omitted).

- uncertainty about demographic parameters, population trends, and habitat needs and use;
- uncertainty in the relationship between local features of a site and bat mortality at that site;
- uncertainty about the technical specifications of wind energy facilities and bat mortality at the site;
- uncertainty about the impacts of wind energy development on Indiana bat migration and summer habitat degradation;
- uncertainty in the ability of possible mitigation and minimization strategies to compensate for the loss of bat individuals and reproductive potential;
- uncertainty in the degree of wind energy development in the Eastern and Midwestern U.S. over next several decades[15];
- uncertainty in how many Indiana bat individuals will be killed by wind turbines over the next several decades;
- uncertainty regarding the impact and spread of White Nose Syndrome;
- uncertainty about the impact of climate change on Indiana bat habitat and hibernacula;
- uncertainty about the aggregate impact of multiple other threats, such as pathogens and climate change, to the Indiana bat and the availability of high quality summer habitats, migration pathways, hibernacula, and swarming sites over the next several decades.

1. The Service Has Identified Numerous Uncertainties that Restrict its Ability to Manage and Recover Indiana Bats.

The Service has identified in two key documents a number of uncertainties associated with Indiana bat demographics, life history, habitat use, management, and recovery. These documents are: (1) the agency's latest draft recovery plan, hereinafter cited as "DRP 2007";[16]

[15] The National Research Council (2007) estimated that for just the mid-Atlantic Highland region, encompassing West Virginia, Virginia, Pennsylvania, and Maryland, installed wind energy capacity by year 2020 could be between 2,158 MW to 3,856 MW. National Research Council, *Environmental Impacts of Wind-Energy Projects*, National Academies Press, Washington, D.C. (2007). The associated estimated impact on non-listed bats is 33,000 – 62,000 bats/yr for the lower estimate and 59,000 – 111,000 bats/yr for the higher estimate. Thus, the estimated impact is about double for the higher estimate of facility development compared to the lower estimate. The range of estimates for wind facility development over the full range of the Indiana bat will likely be even more uncertain than for the smaller Atlantic Highland region, leading to high uncertainty in the possible mortality to Indiana bats. An uncertainty of double the impact is significant when talking about an endangered species.

[16] USFWS, Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision, April 2007, Dept. of Interior.

and (2) the agency's 2009 5-year review, hereinafter cited as "5YR 2009."[17] As the Service states, "significant information gaps remain regarding the species' ecology that hinder sound decision-making on how best to manage and protect the species."[18] An EIS, as opposed to an EA, would allow for adequate study and analysis of these information gaps. Where such information gaps can be identified and the gaps can be even partially filled by further studies within a reasonable time frame, it is incumbent upon the Service to analyze in an EIS those information gaps or explain why the information cannot be obtained prior to action.[19]

a. Habitat use

Apparently no hibernacula have yet been identified in the vicinity of the Project.[20] Therefore, we assume that the impacts of the Project are largely related to Indiana bat migration as well as to Indiana bat summer habitats and habitat use.[21] The range of the Indiana bat includes much of the Eastern and Midwestern U.S., and Ohio is located within the core maternity range of the Indiana bat.[22] The Indiana bat is migratory, hibernating in caves and mines in the winter and migrating to summer habitat. Although some Indiana bat bachelor colonies have been observed, males and non-reproductive females typically do not roost in colonies and may migrate long distances to their summer habitat. Reproductive females may migrate great distances, up to 575 km (357 mi), to form maternity colonies to bear and raise their young."[23]

The DRP 2007 and 5YR 2009 indicate a high level of uncertainty associated with our understanding of Indiana bat summer and migration habitats. For example, the following quotations are taken from the Service's documents:

> Knowledge of the spatial organization of genetic variation, gene flow, and any relationships with fragmentation and/or isolation is needed to develop long term conservation and recovery strategies. 5YR 2009, page 11.

> Because maternity colonies are widely dispersed during the summer and difficult to locate, all the combined summer survey efforts have found only a fraction of the maternity colonies presumed to exist based on the rangewide population

[17] USFWS, Indiana Bat (*Myotis sodalis*) 5-Year Review: Summary and Evaluation, September 2009, Dept. of Interior.
[18] DRP 2007, page 8.
[19] *Nat'l Parks*, 241 F.3d at 733; *Anglers of the Au Sable*, 565 F. Supp. 2d at 830.
[20] DRP 2007, page 19, Fig. 3 and page 25, Fig. 4.
[21] The proximity of a hibernacula to the Project would reinforce the need for, but is not necessary for, an EIS.
[22] 75 Fed. Reg. at 4841.
[23] DRP 2007, page 37.

> estimates derived from winter hibernacula surveys. For example, . . . the 269 known maternity colonies may only represent 6 to 9 percent of the 2,925 to 4,680 maternity colonies we would assume exist. Regardless of reasonable disagreements regarding the average colony size, the geographic locations of the majority of Indiana bat maternity colonies remain unknown. 5YR 2009, page 12
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> Additional summer survey efforts and spring emergence studies will be needed in some areas, particularly along the periphery of the range, before final conclusions may be reached regarding the extent of the species' summer range. Likewise, a comprehensive analysis of existing positive and negative summer survey data is warranted. 5YR 2009, page 12.
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> "Because maternity colonies are widely dispersed during the summer and difficult to locate, all the combined summer survey efforts have found only a fraction of the maternity colonies presumed to exist based on the rangewide population estimates derived from winter hibernacula surveys. For example, based on the 2005 rangewide population estimate of 457,374 bats, and assuming a 50:50 sex ratio, and an average maternity colony size of 50 to 80 adult females (Whitaker and Brack 2002), then the 269 maternity colonies in Table 4 may only represent 6 to 9 percent of the 2,859 to 4,574 maternity colonies we would assume exist. Regardless of reasonable disagreements regarding the average colony size, the geographic locations of the majority of Indiana bat maternity colonies remain unknown." DRP 2007, page 27.
>
> In short, our understanding of how and to what extent distribution of hibernacula and local and regional climate and elevation differences influence the distribution and abundance of maternity colonies is still evolving. DRP 2007, page 28.
>
> Little information is available to determine habitat use and needs for Indiana bats during migration. Recent spring emergence telemetry studies in New York and Pennsylvania are beginning to document migratory routes in the northeast. DRP 2007, page 44.

Two conclusions may be reached from these statements. First, intensive multi-year surveys using the latest technology are needed to identify whether and to what extent Indiana bats may use the Project area for migration and/or summer foraging or roosting. The discrepancy between hibernacula surveys and identified maternity colonies indicates that current survey extent or techniques may not be sufficient to identify bat habitats. The Service must therefore select survey and monitoring protocols carefully. Second, without further study and analysis, the impact of habitat modification and fragmentation on Indiana bats is highly uncertain. Thus, given current information, choosing between alternatives with different levels

of habitat modification or choosing between sites with different characteristics will be very difficult, if possible.

b. Demographic parameters

The DRP 2007 and 5YR 2009 indicate a high level of uncertainty regarding Indiana bat demographic parameters, such as birth and mortality rates. For example, the following quotations are taken from the Service's documents:

> Because of lack of information on the species' demographic parameters, it is not possible to calculate a minimum viable population number for this species or to justify biologically an overall numerical population goal. 5YR 2009, App. A, page 3.

> Births, immigration, deaths, and emigration reflect the primary population processes responsible for changes in population size. Demographics include those biologically relevant parameters, such as total population size, age distribution, age-specific survival, sex ratio, sex-specific survival, and fecundity or reproductive rate, which influence population change by acting on one or more of these processes. These parameters are key components in understanding the extinction risk faced by the Indiana bat. Current demographic information for this species is mostly unknown. DRP 2007, page 38.

> In summary, the information necessary to model extinction risk and guide recovery of the Indiana bat is incomplete at this time. As referenced above, sex-specific survival, age structure, and age-specific survival data would vastly improve understanding of this species' demographics. The primary approach to gathering such information for other taxa requires capture-recapture methodologies that have not yet been applied to this species. Recent advances in marking and molecular genetic techniques, in combination with more powerful capture-recapture models, may offer the opportunity to close critical information gaps. DRP 2007, page 39.

The number of Indiana bat individuals that can be lost without compromising the viability of the species is highly uncertain. This uncertainty is particularly relevant for analyzing cumulative effects. To determine the magnitude and significance of the environmental consequences of the proposed Project in the context of the cumulative effects of past, present, and future actions, the NEPA analyst must define an appropriate threshold condition of the resource beyond which adverse change would cause significant degradation.[24] Given the lack of a minimum viable population threshold, the Service will probably use the stated Reclassification

[24] CEQ 1997, page 41.

Criterion (2005 population levels) as the threshold condition.[25] However, recent declines in populations due to White Nose Syndrome (discussed below) will very possibly drive the species below the threshold condition. The Service recently changed the Recovery Priority Number for the Indiana bat from "8" to "5," meaning that the degree of threat is high and the recovery potential of the species is low, primarily due to the impacts of White Nose Syndrome.[26] The effects of dropping below the threshold condition (2005 population levels) and of allowing take by this Project in the context of declining populations are highly uncertain. Even though some uncertainties in demographic parameters are not likely to be resolved within the time frame of an EIS, this high level of uncertainty indicates that the Service must carefully analyze and predict cumulative impacts on Indiana bat demographics.

c. Impact and spread of White Nose Syndrome

White Nose Syndrome ("WNS") has emerged as an unprecedented threat to hibernating bat species in North America. The consensus of bat experts at a May 2009 meeting in Austin, Texas was that WNS is a devastating disease of hibernating bats that has caused the most precipitous decline of North American wildlife in recorded history. For example, the New York population of Indiana bats was estimated at 52,803 bats in 2007 and had been increasing over recent years, but surveys conducted at New York's hibernacula during early 2008 (post-WNS) estimated the population at 37,141 Indiana bats (a drop of 15,662 bats), which is a 30% decrease from the previous year's estimate. The Service presumes that the observed decline in the New York population was a direct result of WNS-related mortality.[27] The Service states, "[w]e anticipate that the 2009 rangewide population estimate will be lower than the 2007 estimate because of mortality associated with WNS in the Northeast."[28]

Although the occurrence of WNS currently appears to be concentrated in the Northeast, the occurrence of WNS will likely spread westward into the Midwest. Since its initial discovery in New York in 2006, WNS has already spread approximately 500 miles. The Service states,

[25] "Species experts consider the 2005 population estimate of 457,000 to be an adequate number for recovery as long as the threats to the species have been alleviated . . . the population growth rate has been positive . . . and there is a range-wide distribution that incorporates the need for redundancy, resiliency, and representation[.]" 5YR 2009, App. A, page 3.
[26] 5YR 2009, page 21-22.
[27] 5TR 2009, page 10.
[28] 5YR 2009, page 7.

> With 15% of the 2007 rangewide population, Indiana bats in Region 5 of the Service (i.e., the Northeast Region) currently are at highest risk for contracting WNS and suffering additional population declines. Given its current rate of spread, WNS is expected to reach Indiana bat hibernacula in Regions 3 (Midwest Region) and 4 (Southeast Region) within the next couple of winters. In 2007, Indiana bat hibernacula in the Midwest and Southeast contained 67.4% and 17.6% of the rangewide population, respectively (UFWS, unpublished data, 2009). If current trends of mortality at affected sites and spread to additional sites continue, WNS threatens to drastically reduce the abundance of most species of hibernating bats in major regions of North America in a remarkably short period of time." 5YR 2009, page 17.

The Service's 2009 5-year review recognizes the high uncertainty surrounding management and recovery of the Indiana bat in the face of WNS and other threats. "A primary concern for managers is the ability to scientifically predict when and where the fungus will next occur, which at present is highly uncertain. . . . Additional research to understand the causes and potential spread of WNS should be initiated immediately."[29]

Given that these reversals in abundance may continue and intensify, and that WNS will likely spread westward, an EIS is the appropriate vehicle for justifying the take of Indiana bats by the Project. In addition, in the face of uncertain and significant threats to the Indiana bat across its range, cumulative effects also should be analyzed in an EIS.

2. The Scientific Literature Indicates that the Interaction of Bats and Wind Turbines is Highly Uncertain

The scientific community of bat experts has proposed no less than eleven hypotheses to explain where, when, how, and why insectivorous bats are killed at wind energy facilities.[30] To date, our understanding of bat behavior and ecology is insufficient to narrow this list of hypotheses. The uncertainties and information needs associated with the interaction of bats and wind power facilities in general also apply to the Indiana bat. Kunz et al. proposed a number of research directions to advance our knowledge about the causes of bat fatalities at wind energy facilities and to help guide the establishment of mitigating solutions. Some of these proposed

[29] 5YR 2009, page 17, 23.

[30] Cryan, P. M. and R. M. R. Barclay, *Causes of Bat Fatalities at Wind Turbines: Hypotheses and Predictions*, J. Mammalogy 90(6): 1330–1340, 1338 (2009); Kunz, Thomas H., Edward B. Arnett, Wallace P. Erickson, Alexander R. Hoar, Gregory D. Johnson, Ronald P. Larkin, M. Dale Strickland, Robert W. Thresher, and Merlin D. Tuttle, *Ecological Impacts of Wind Energy Development on Bats: Questions, Research Needs, and Hypotheses*, Frontiers Ecol. Environ. 5(6): 315–324 (2007a).

studies can be advanced and can bear fruit within the time frame of an EIS. The need to fill such information gaps was well stated by Cryan and Barclay:

> If the ultimate cause or causes of bat fatalities at wind turbines are not established, it may never be possible to accurately assess risk to bats before turbines are built, measure the true impacts of turbines on affected populations, or come up with the most efficient ways to avoid or minimize fatalities. Although mitigation techniques such as operational curtailment are likely to be an effective way of minimizing fatalities at existing turbines (Baerwald et al. 2009; E. B. Arnett, pers. comm.), land managers, conservationists, and wind energy developers also want to know in advance, before turbines are built, how they can avoid bat fatalities. Establishing the underlying causes of bat fatalities at turbines may be the most likely way of preventing them, starting at the earliest planning stages of wind energy development.[31]

Production of an EIS for this Project's ITP can bring us a significant step closer to filling critical information gaps for the Indiana bat. It would be inconsistent with the requirements of the Endangered Species Act to issue an ITP for this Project without attempting to accurately assess risk to Indiana bats before the turbines are built.

3. The GAO Reported that the Interaction of Bats and Wind Turbines is Highly Uncertain

The 2005 report by the GAO on the impacts of wind energy facilities on wildlife recognized a high degree of uncertainty regarding potential impacts.[32] The GAO stated the following in its report:

> While experts told us that the impact of wind power facilities on wildlife is more studied than other comparable infrastructure, such as communication towers, important gaps in the research remain. First, relatively few postconstruction monitoring studies have been conducted and made publicly available. It appears that many wind power facilities and geographic areas in the United States have not been studied at all. GAO 2005, page 15.

> A second important research gap is in understanding what factors increase the chances that turbines will be hazardous to wildlife. For example, it can be difficult to discern, among other things, how the number, location, and type of turbine; the number and type of species in an area; species behavior; topography; and weather

[31] Cryan and Barclay (2009) at 1338.

[32] Government Accountability Office (GAO) Report to Congressional Requesters, *Wind Power, Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife*, GAO-05-906, Washington D.C. (2005).

> affect mortality and why. Drawing conclusions about the degree of risk posed by certain factors—such as terrain, weather, or type of turbine—is difficult because sites differ in their combination of factors. For example, according to experts, data are inadequate about what turbine types are most hazardous and to what species. This is partly because most wind power facilities use only one turbine type. Therefore, even if one facility proved more hazardous than another, it would be difficult to attribute the difference to turbine type alone because other variables, such as topography or migratory patterns, are also likely to vary among the sites. Additionally, comparisons between studies are difficult because researchers may use different study methodologies. GAO 2005, page 16-17.
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> A third research gap is the lack of complete and definitive information on the interaction of bats with wind turbines. As previously noted, bats have collided with wind turbines in significant numbers in some parts of the United States, but scientists do not have a complete understanding regarding why these collisions occur. Bats are known to have the ability to echolocate to avoid collision with objects, and they have been able to avoid colliding with comparable structures such as meteorological towers. Therefore, their collision with wind turbines remains a mystery. The few studies that have been conducted show that most of the kills have taken place during the migratory season (July through September), and this suggests that migrating bats are involved in most of the fatalities. In addition, one study showed that lower wind speeds were associated with higher fatality rates. However, experts admit that much remains unknown about why bats are attracted to and killed by turbines and about what conditions increase the chances that bats will be killed. One expert noted that there is still very little known about bat migration in general and about the way in which bat interactions with turbines are affected by weather patterns. This expert further noted that there still has not been a full season of monitoring bat mortality from which patterns can be identified. GAO 2005, page 17-18.

4. The USFWS Interim Guidelines Lists Research Needs Relevant to this Case

Appendix 4 of the USFWS Interim Wind Guidelines[33] lists studies needed to understand the impacts of wind power development on wildlife. This list was compiled by representatives of the Service's Wind Turbine Siting Working Group. The listed research needs are as follows:

- Effectiveness of seasonal wind turbine shutdowns at preventing mortalities, including the feasibility of using "self-erecting" turbines that are easily erected and dismantled without cranes, and taking them down during critical periods such as migrations.

[33] USFWS, *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (May 13, 2003).

- Effects of inclement weather in attracting birds and bats to lighted turbines, e.g., drawing birds and bats to within rotor-swept area of turbines, particularly for passerines during spring and fall migrations.
- Localized effects of turbines on wildlife: habitat fragmentation and loss; effects of noise on both aquatic and terrestrial wildlife; habituation.
- Effects of wind turbine string configuration on mortality, e.g., end of row turbine effect, turbines in dips or passes or draws, setbacks from rim/cliff edges.
- Effectiveness of deterrents: alternating colors on blades (particularly, effect of black/white and UV gel coats on the smear effect); lights (e.g., color, duration, and intensity of pilot warning lights; lasers); infrasound (Breco Buoys, other noisemakers such as predator and distress calls if not irritating to humans, other wildlife, or domestic animals); visual markers on guy wires.
- Utility of acoustic, infrared, and radar technologies to detect bird species presence, abundance, location height, and movement.
- Accuracy of mortality counts: estimate of the number of carcasses (especially of passerines) lost because they have been fragmented and lost to collision momentum and the wind; size and shape of dead bird search areas; possibility of recording collisions acoustically or with radar or infrared monitoring.
- Annual variability (temporal and spatial) in migratory pathways; what is the utility of Geographic Information System to assess migratory pathways and stopovers, particularly for passerines and bats.
- Impacts of larger turbines versus smaller models.

5. The Effectiveness of Possible Mitigation and Minimization Strategies is Highly Uncertain

The Service, to issue an ITP, must find that the Project's applicant "will, to the maximum extent practicable, minimize and mitigate the impacts of such taking."[34] In general, an agency's decision to forego an EIS may be justified in some circumstances by the adoption of mitigation measures. In this case, however, the ability of possible mitigation and minimization strategies to compensate for the loss of Indiana bat individuals and reproductive potential due to the Project is

[34] 16 U.S.C. §1539(a)(2)(B).

highly uncertain and cannot be sufficiently addressed in an EA. An EIS is required to sufficiently resolve key information gaps where practical and to analyze the remaining uncertainties.[35]

In the NOI (75 Fed. Reg. 4840), the Service listed some possible mitigation measures to avoid and minimize impacts to Indiana bats, including the impact of lethal take, for this Project:

> Protection of roost trees and surrounding habitat, set-back distances from known roost trees, mapping and avoidance of foraging areas, protection and enhancement of Indiana bat habitat outside the project area, removal of small woodlots near turbines to preclude expansion of Indiana bat usage near turbines, various curtailment regimes for turbines during prime activity or migration periods, and post-construction monitoring for fatalities.[36]

The effectiveness of these cited mitigation measures is highly uncertain. For example, one mitigation measure cited by the Service is to compensate for Indiana bat fatalities at the Project site by protecting off-site habitat. However, the Service has recently stated that there is "currently no reliable method for determining or evaluating the relative value of [different] areas as summer habitat for the Indiana bat."[37] As discussed above, how bat presence and mortality are related to landscape and habitat features is highly uncertain. Thus, attempting to mitigate for mortality or habitat loss in one area with increased protection of another area will require detailed analysis and prediction. An EIS is the appropriate vehicle to ensure habitat quality equivalence between areas.

Another mitigation measure cited by the Service is to protect roost trees and surrounding habitat. However, this may do nothing to prevent mortality of individuals migrating through the Project site, moving among different foraging and roosting locations, and moving between roosting and foraging areas.[38] Similarly, the effectiveness of providing set-back distances from known roost trees is highly uncertain because bats may pass through the Project site when moving during migration or between summer habitat areas. Also, substantial uncertainty exists

[35] *See Nat'l Parks*, 241 F.3d at 733-35 (EIS required where effectiveness of proposed mitigation measures was too uncertain).
[36] 75 Fed. Reg. at 4841.
[37] 72 Fed. Reg. 9916, *Endangered and Threatened Wildlife and Plants; 90-Day and 12-Month Findings on a Petition To Revise Critical Habitat for the Indiana Bat* (March 6, 2007).
[38] Both male and female Indiana bats change roost trees and locations throughout the summer, and often travel miles between roosts and foraging areas. *See*, for males, *Animal Welfare Institute v. Beech Ridge Energy LLC.*, 2009 U.S. Dist. LEXIS 114267, * 13, _____ F. Supp. 2d _____ (D. Md., December 8, 2009); for females, DRP 2007, page 46-47, 50-51.

regarding what locations, let alone what trees, are being used by Indiana bats. Detecting and predicting the presence of Indiana bats in any particular area is fraught with uncertainty, as highlighted by the tribulations discussed in the *Beech Ridge* case.[39] The Service must require an ongoing obligation to continually monitor for bat presence using the latest technology as well as maintain a readiness to modify turbine operations if Indiana bats are detected.[40] Furthermore, setbacks to roost trees will be largely ineffective if the bats are attracted to wind turbines, a hypothesis discussed by Cryan and Barclay.[41]

The effectiveness of curtailment regimes for turbines during prime activity or migration periods also is highly uncertain. Although Cryan and Barclay indicate that "mitigation techniques such as operational curtailment are likely to be an effective way of minimizing fatalities at existing turbines"[42] such measures will not be effective unless the match between shut-down periods and the timing of possible movements through the Project site is evaluated in detail. Operational mitigation measures were cited in Appendix 4 of the USFWS Interim Guidelines as a subject in need of research.[43] An EIS is the appropriate vehicle for such an analysis.

The mitigation measure referred to as "removal of small woodlots near turbines to preclude expansion of Indiana bat usage near turbines" (75 Fed. Reg at 4841) requires careful analysis. "[L]oss of forest cover and degradation of forested habitats have been cited as part of the decline of Indiana bats."[44] The Service should be very careful to analyze the effects of removing potential Indiana bat habitat in an effort to keep bats away from turbines. Our knowledge of the way that Indiana bats use habitat for foraging, roosting, migration, and other movements is very limited, and removal of forest cover may have non-obvious effects.[45] For example, suitable patches of forest may not be available to Indiana bats unless the patches are connected by a wooded corridor, i.e., a component of suitable habitat may be the connectedness

[39] *Beech Ridge Energy*, 2009 U.S. Dist. LEXIS 114267, * 13.
[40] *See, e.g., Heartwood v. USFS*, 380 F.3d 428, 435-36 (8th Cir. 2004) (pointing out that it is difficult to find Indiana bats even with nearby surveys and mist-netting, and citing to measures in Service Biological Opinion to compensate for such difficulties).
[41] Cryan and Barclay (2009).
[42] Cryan and Barclay (2009) at 1338.
[43] USFWS, Interim Guidelines, 2003, App. 4 ("Effectiveness of seasonal wind turbine shutdowns at preventing mortalities, including the feasibility of using "self-erecting" turbines that are easily erected and dismantled without cranes, and taking them down during critical periods such as migrations.")
[44] DRP 2007, page 74.
[45] *Id*.

of different forest patches.[46] Removal of small woodlots thus may decrease the connectedness of the remaining forest patches surrounding the Project area, even if no roost trees are destroyed. This effect must be adequately evaluated.

Finally, the Service recognizes that post-construction monitoring for bat presence and fatalities will be an essential component of mitigation for an ITP, and alternative monitoring strategies must be evaluated in the NEPA document. To be effective for adaptive management, monitoring protocols must be conducted using the best available designs, methods, technologies, and analyses.[47] An EIS is the appropriate vehicle for a complete analysis of these issues. Equally important is a multi-year pre-construction monitoring effort. Moreover, the Service should consider and evaluate a requirement that the Project's owners and developers fund construction and post-construction studies designed to assess the impacts of the facility on bats and other wildlife.

A mitigation measure likely to be very important for minimizing the take of Indiana bats, but not mentioned in 75 Fed. Reg. 4840, is to mandate design and micro-siting standards for the Project's turbines. Technical specifications such as the height of turbines, the distance between turbines, and the rotational speed of the blades are likely to be significantly related to bat fatalities.[48] Because the pathways and altitudes of Indiana bat movements are highly uncertain,[49] understanding and analyzing the likely effects of such technical standards requires an EIS.

6. Post-Implementation Monitoring Does Not Replace the Need to Resolve and Evaluate Uncertainties as Part of an EIS Prior to Issuing the ITP.

In the NOI (75 Fed. Reg. at 4840), the Service cited "post-construction monitoring for fatalities" as a possible measure to avoid and minimize impacts to Indiana bats, including the impact of lethal take.[50] As part of an overall mitigation strategy, monitoring of the Project for bat presence and fatalities can add to our understanding of the Project's impacts. The Project can

[46] DRP 2007, page 66.
[47] Kunz, Thomas H., Edward B. Arnett, Brian M. Cooper, Wallace P. Erickson, Ronald P. Larkin, Todd Mabee, Michael L. Morrison, M. Dale Strickland, and Joseph M. Szewczak, *Assessing Impacts of Wind-Energy Development on Nocturnally Active Birds and Bats: A Guidance Document*, J. Wildlife Mgmt. 71(8): 2449–2486 (2007b).
[48] Baerwald, E. F. and R. M. R. Barclay, *Geographic Variation in Activity and Fatality of Migratory Bats at Wind Energy Facilities*, J. Mammalogy 90(6): 1341–1349 (2009); Horn, Jason W., Edward B. Arnett, and Thomas H. Kunz, *Behavioral Responses of Bats to Operating Wind Turbines*, J. Wildlife Mgmt. 72(1): 123–132 (2008).
[49] DRP 2007, page 49-51, 66.
[50] 75 Fed. Reg. at 4841.

make corrections to its operating procedures based on the incoming information (e.g., adaptive management). However, monitoring and adaptive management cannot substitute for a substantiated and effective set of mitigation measures. This was the conclusion of the district court in *Nat'l Parks & Conservation Ass'n v. Babbitt*:

> The EA describes the intensity or practical consequences of these effects, individually and collectively, as "unknown." . . . The lack of data regarding the practical effect of increased traffic, like the failure to investigate environmental impacts in Blue Mountains, 161 F.3d at 1213, undermines "[t]he [Parks Service's] EA ... [which] is where the [agency's] defense of its position must be found." Id. That document states that "[l]ittle is known about the effects of the [cruise ship] disturbance" on steller sea lions; "[t]he effect of increased levels of disturbance" on Glacier Bay's cetacean populations is "unknown"; and "the degree of increase [in oil spills as a result of increased traffic] is unknown." It also states that the effect of noise and air pollution on murrelets, bald eagles, and waterfowls remains "unknown" because unstudied. Moreover, the extent to which air pollution will diminish the beauty and quality of the natural environment is also unknown. The Parks Service's EA does, however, establish both that such information may be obtainable and that it would be of substantial assistance in the evaluation of the environmental impact of the planned vessel increase. The EA proposes a park research and monitoring program to "fill information needs, and understand the effects of vessel traffic on air quality, marine mammals [and] birds ... to assist in the prediction, assessment, and management of potential effects on the human, marine, and coastal environments of Glacier Bay resulting from human use of the environment with particular emphasis on traffic." *That is precisely the information and understanding that is required before a decision that may have a significant adverse impact on the environment is made, and precisely why an EIS must be prepared in this case.*
>
> *** * ***
>
> The Parks Service proposes to increase the risk of harm to the environment and then perform its studies. It has in fact already implemented the first part of its VMP. *This approach has the process exactly backwards.* Before one brings about a potentially significant and irreversible change to the environment, an EIS must be prepared that sufficiently explores the intensity of the environmental effects it acknowledges. A part of the preparation process here could well be to conduct the studies that the Park Service recognizes are needed. That might be done here by performing the studies of the current vessel traffic and extrapolating or projecting the effects of the proposed increase. Ultimately, the Park Service may develop other means for obtaining the information it currently lacks. *The point is, however, that the "hard look" must be taken before, not after, the environmentally-threatening actions are put into effect.*[51]
>
> * * *
>
> *As with the question of the extent of the unremediated injury that might otherwise occur, the question of the impact of the proposed mitigation measures must be*

[51] *Nat'l Parks*, 241 F.3d at 732-33 (italics added).

> *studied as part of the preparation of an EIS rather than after the injury has transpired. The fact that the agency plans to test the effect of its mitigation measures does not relieve it of the obligation to prepare an EIS prior to the time of the threatened environmental damage.* Rather, the Parks Service's testing proposal shows that the information necessary to determine the impact of any mitigation measures, like the information relating to the extent of the injurious effects, may well be obtainable before any environmental injury occurs. The proposed mitigation studies thus argue in favor of preparing an EIS, not against it.[52]

The potential mitigation measures for this Project, including monitoring, must be analyzed in detail as part of the NEPA document, and an EIS is the appropriate vehicle for this analysis.

B. 40 C.F.R. §1508.27(b)(6): The degree to which the action may establish a precedent for future actions with significant effects. *Will this NEPA analysis set a precedent for other NEPA analyses?*

The purpose of the factor in 40 C.F.R. §1508.27(b)(6) is "to avoid the thoughtless setting in motion of a chain of bureaucratic commitment that will become progressively harder to undo the longer it continues."[53] For example, the district court in *Anglers of the Au Sable v. USFS* held that the outcome of a proposed gas drilling project would likely set a precedent for future drilling in the region, an effect that was not considered in the EA: "Just as the Forest Service frequently references the currently active wells in the Huron-Manistee Forest to help justify its FONSI, allowing drilling so near the Mason Tract would almost certainly color the Forest Service's analysis of the environmental impact of these future wells."[54] In *Anderson v. Evans*, the circuit court required the Department of Commerce to prepare a full EIS where the agency had not considered the possibility that its decision, although limited in both scope and duration, might affect future agency deliberations.[55]

After the *Beech Ridge* case, the ITP requested for this Project, if issued, would be in the first group of numerous ITP applications that the Service will receive over the next several years

[52] *Nat'l Parks*, 241 F.3d at 735 (italics added).
[53] *Ctr. for Biologial Diversity v. USFWS*, 202 F. Supp. 2d 594, 659 (W.D. Texas 2002), citing *Presidio Golf Club v. National Park Serv.*, 155 F.3d 1153, 1162-63 (9th Cir. 1998) (quoting *Sierra Club v. Marsh*, 769 F.2d 868, 879 (1st Cir. 1985)).
[54] *Anglers of the Au Sable*, 565 F. Supp. 2d at 831-32.
[55] *Anderson v. Evans*, 371 F.3d 475, 493 (9th Cir. 2004) (holding that Commerce Department violated NEPA by failing to prepare EIS rather than an EA prior to approving whaling quota).

as wind energy development ramps up to satisfy national policy goals. Kunz et al. report that in 2005, utility-scale wind energy facilities in the U.S. accounted for approximately 9616 MW of installed capacity, but that by 2020 available estimates of installed capacity in the U.S. range up to 72,000 MW, or an equivalent 48,000 1.5 MW wind turbines.[56] Many of those turbines will be within the range of the Indiana bat. Like the district court's assessment in *Anglers of the Au Sable* that the agency's analysis of the project at hand would color its analyses of the impacts of future drilling projects, the Service's analysis of the impacts of this Project on the Indiana bat will color the Service's NEPA analyses for ITP applications for future wind power projects within the range of the Indiana bat. Future ITPs for the Indiana bat will depend on the success of the initial group of ITPs for wind power facilities, a group which includes this Project's proposed ITP. Production of an EIS is appropriate for this Project, which comes relatively early in an expected period of rapid expansion of wind power development in the Eastern and Midwestern U.S.

C. 40 C.F.R. §1508.27(b)(7): WHETHER THE ACTION IS RELATED TO OTHER ACTIONS WITH INDIVIDUALLY INSIGNIFICANT BUT CUMULATIVELY SIGNIFICANT IMPACTS. *WILL THE INCREMENTAL IMPACT OF THE PROJECT'S IMPACTS, WHEN ADDED TO THE AGGREGATE THREATS TO INDIANA BATS, BE SIGNIFICANT?*

"Cumulative impact" is defined in NEPA as "the impact on the environment [that] results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions."[57] Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts are thus the total effect, including both direct and indirect effects, on a given resource (in this case the endangered Indiana bat), of all actions taken, no matter who has taken the actions (federal, nonfederal, and private).[58]

The Service's cumulative effects analysis for the Project must consider the potential impacts to Indiana bats of multiple wind energy facilities, combined with pathogens (e.g., White Nose Syndrome); other causes of habitat loss such as logging and residential development; shifts

[56] Kunz et al. (2007a).
[57] 40 C.F.R. §1508.7.
[58] CEQ, 1997, page 8.

in summer habitats, migration pathways, hibernacula, and swarming sites due to climate change; disturbance to hibernacula; as well as other threats to Indiana bat populations.

Before issuing an ITP the Service must make certain specified findings. These include findings that the taking will be incidental, that it "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild," and that "the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking."[59] Moreover, as discussed in part D below, the NEPA analysis must consider the impacts to the population of Indiana bats in the Project area as well as to the species range-wide. Because the aggregate of threats to the Indiana bat are substantial and complex, and the cumulative impact of these threats is significant, an EIS is the appropriate vehicle for the analysis of cumulative effects for this Project.

1. Cumulative Effects Analysis Must Encompass Future Activities Likely to Occur Over the Life of the Proposed Facility

The NEPA analysis for this Project should consider any foreseeable future events that correspond to the time frame of the Project's impacts. Thus, if the wind energy facility is projected to run for several decades, the NEPA analyst should attempt to identify actions that could reasonably be expected to occur at least within that period.[60] The development of multiple wind energy facilities in Ohio and across the range of the Indiana bat, the spread of WNS, and other threats to bats are highly foreseeable future events potentially affecting the species within the time frame of the Project's life. Reasonable forecasting is implicit in NEPA and the Service must predict the cumulative impacts on the Indiana bat before they are fully known.[61]

2. Cumulative Effects Analysis Must Encompass the Full Range of Indiana Bat Habitat

The CEQ advises that when analyzing the contribution of the proposed action to cumulative effects, the geographic boundaries of the analysis should be conducted at the scale of human communities, landscapes, airsheds, watersheds, or eco-regions.[62] Generally, the NEPA

[59] 16 U.S.C. §1539(a)(2)(B).
[60] CEQ, 1997, page 16.
[61] CEQ, 1997, page 19. *See also* 40 C.F.R. §1502.22.
[62] CEQ, 1997, page 12-14.

analyst must determine the geographic areas occupied by the affected resources outside of a project impact zone, and in most cases "the largest of these areas will be the appropriate area for the analysis of cumulative effects."[63] For example, for migratory wildlife the appropriate geographic scale of analysis would be the breeding grounds, migration route, wintering areas, and total range of affected population units.[64]

For this Project, the geographic scale of the cumulative effects analysis should cover the full range of the Indiana bat, including habitats suitable for migrating, hibernating, rearing, foraging, mating, roosting, and other activities. In this case the NEPA analyst must determine the aggregate of past, present, and reasonably foreseeable future actions affecting Indiana bat populations, and the capacity of those populations to accommodate the cumulative impacts and sustain themselves in the future. Consideration of the full range of Indiana bat habitats and threats is necessary to substantiate a finding that the impacts of multiple wind energy facilities and other threats in the aggregate "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild."[65]

3. The CEQ Found that EAs Tend to Underestimate Cumulative Effects

According to the CEQ, the fact that the human environment continues to change in unintended and unwanted ways in spite of improved federal decision making resulting from the implementation of NEPA is largely attributable to cumulative impact.[66] The CEQ found that the increased use of EAs rather than EISs in recent years "could exacerbate the cumulative effects problem" because EAs "tend to underestimate the cumulative effects of their projects." [67] The cumulative impact on Indiana bats of multiple wind energy facilities combined with the numerous other identified threats will require an in-depth evaluation. An EIS is the appropriate vehicle for this evaluation.

[63] CEQ, 1997, page 15.
[64] *Id*. *See also NRDC v. Hodel*, 865 F.2d 288, 297-300 (D.C. Cir. 1988) (requiring the Secretary of Interior to analyze the cumulative effects of offshore drilling near California and Alaska together because whales and salmon would pass through both project drilling areas in the normal course of migration).
[65] 16 U.S.C. §1539(a)(2)(B).
[66] CEQ, 1997, page 4.
[67] *Id*.

4. Cumulative Effects on Indiana Bats May be Significant

The NEPA analyst's primary goal is to determine the magnitude and significance of the environmental consequences of a proposed action in the context of the cumulative effects of past, present, and future actions.[68] Significance exists "if it is reasonable to anticipate a cumulatively significant impact on the environment."[69]

Some of the important sources of direct and indirect mortality on Indiana bats include killing of bats by wind turbines and other obstacles such as communication towers and vehicles; killing of bats in their hibernacula; exposure to environmental contaminants; and WHS, which has killed thousands of Indiana bats and which may reverse recent population gains.[70] Human disturbance at hibernacula is still an important threat to Indiana bats.[71] Like WNS, disturbances during hibernation may compromise the ability of bats to successfully maintain energy reserves through the winter. In addition, there is growing concern at the Service regarding the potential for bat kills by wind turbines and population declines given the rapid proliferation of wind farming and the large-scale mortality that has occurred at some facilities.[72] The cumulative effects of these threats to Indiana bats are likely to be significant and will require an EIS for effective analysis.

In the 2009 5-year review of the Indiana bat, the Service discussed and listed the main threats to Indiana bats as follows:

> The original recovery plan (USFWS 1983) identified threats or "causes of decline" as:
>
> • natural hazards (i.e., flooding, freezing, mine ceiling collapse),
> • human disturbance and vandalism at hibernacula (identified as "the most serious cause of Indiana bat decline"),
> • deforestation and stream channelization,
> • pesticide poisoning,
> • indiscriminate scientific collecting,
> • handling and banding of hibernating bats by biologists,
> • commercialization of hibernacula,
> • exclusion of bats from caves by poorly designed gates,
> • man-made changes in hibernacula microclimate (blocking or adding entrances and/or by poorly designed gates), and
> • flooding of caves by dams/reservoir developments.

[68] CEQ, 1997, page 41.
[69] *BARK v. BLM*, 643 F. Supp. 2d 1214, 1222 (D. Or. 2009).
[70] *See* DRP 2007, page 82-83, 93-101; 5YR 2009, page 10, 20.
[71] 5YR 2009, page 15.
[72] DRP 2007, page 101.

> Several of the original threats listed above have largely been addressed and are no longer adversely affecting the species to the degree or extent that they once had (e.g., human disturbance at hibernacula, indiscriminate scientific collecting, banding of hibernating bats, commercialization of hibernacula, and poorly designed cave gates).
> * * *
> The 2007 Plan (USFWS 2007) identified and expounded upon additional threats including:
>
> - quarrying and mining operations (summer and winter habitat),
> - loss/degradation of summer/migration/swarming habitat,
> - loss of forest habitat connectivity,
> - some silvicultural practices and firewood collection,
> - disease and parasites,
> - predation,
> - competition with other bat species,
> - environmental contaminants (not just "pesticides"),
> - climate change, and
> - collisions with man-made objects (e.g., wind turbines, communication towers, airstrikes with airplanes, and roadkill).
>
> With few exceptions, all of the identified threats are still affecting the species to varying degrees. The most significant rangewide threats to the Indiana bat have traditionally been habitat loss/degradation, forest fragmentation, winter disturbance, and environmental contaminants. In addition to these threats, climate change and White-Nose Syndrome are increasingly being identified as significant threats to the future recovery of the Indiana bat and its congeners.[73]

Habitat modification and destruction are serious threats to the Indiana bat and increase the likelihood that the cumulative impact on the bats is significant. The degradation of Indiana bat summer habitats, migration pathways, and swarming sites by the cumulative impact of wind facility development and other land uses potentially will have a significant impact on Indiana bat survival and reproductive success.[74] Summer habitat is important to Indiana bats.[75] The 1999 Draft Recovery Plan for the Indiana bat recognized the "need to . . . conserve the known habitats that the species uses throughout [the bat's] annual cycle."[76] The 2007 Draft Recovery Plan highlights an increased concern over non-hibernation habitats. Factors that may exacerbate the Indiana bat's vulnerability include energetic impacts of significant disruptions to roosting areas (both in hibernacula and maternity colonies) and connectivity and conservation of roosting-

[73] 5YR 2009, page 13-14.
[74] DRP 2007, page 7-8.
[75] 72 Fed. Reg. 9913, 9915-16.
[76] 72 Fed. Reg. 9913, 9914.

foraging and migration corridors.[77] Although Humphrey et al. opined that summer habitat does not appear to be limiting to the Indiana bat, "since that time, loss of forest cover and degradation of forested habitats have been cited as part of the decline of Indiana bats."[78] Wind energy facilities alone, including the Project, have the potential to significantly impact these habitats through land surface disturbance necessary for turbines, access roads, substations, right-of-ways for transmission lines, and other ancillary structures.

The Service recently changed the Recovery Priority Number for the Indiana bat from "8" to "5," meaning that the degree of threat is high and the recovery potential of the species is low, primarily due to the impacts of WNS.[79] Moreover, the Ohio population of Indiana bats has decreased 22% between the years 2005 and 2007.[80] If WNS and other threats drive the range-wide Indiana bat abundance downward and below the recovery thresholds in the next years or decades (during the life of the Project), which appears probable, any reduction of the population, even by the amount of take expected at a 130 turbine wind energy facility, would be significant and would require justification in an EIS.[81]

D. 40 C.F.R. § 1508.27(b)(9): THE DEGREE TO WHICH THE ACTION MAY ADVERSELY AFFECT AN ENDANGERED OR THREATENED SPECIES OR ITS HABITAT. DOES THE FACT THAT THE PROJECT WILL LIKELY TAKE THE ENDANGERED INDIANA BAT MAKE THIS A SIGNIFICANT IMPACT?

The "significance" of a proposed project's environmental impact must be evaluated in light of the degree to which the action may adversely affect an endangered or threatened species or its habitat. Not all adverse effects to an endangered or threatened species require an EIS -- "the question ultimately is one of degree."[82] Moreover, whether an EIS is appropriate depends

[77] DRP 2007, page 7, 55-70 Many species of bats, including the Indiana bat, consistently follow tree-lined paths rather than cross large open areas. Therefore, suitable patches of forest may not be available to Indiana bats unless the patches are connected by a wooded corridor, i.e., a component of suitable habitat may be the connectedness of different forest patches.
[78] DRP 2007, page 74.
[79] 5YR 2009, page 21-22.
[80] 5YR 2009, Appendix A, Table 2.
[81] The second Reclassification Criterion for Indiana bat recovery is, "[a] minimum overall population estimate equal to the 2005 population estimate of 457,000." 5YR 2009, App. A, page 3. The third Reclassification Criterion is positive annual population growth rates and minimal risk of population declines over the next 10- year period. 5YR 2009, App. A, page 5.
[82] *Anglers of the Au Sable*, 565 F. Supp. 2d at 832-33; *see also Envtl. Prot. Info. Center v. United States Forest Serv.*, 451 F.3d 1005, 1012 (9th Cir. 2006); *Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1276 (10th Cir. 2004).

on the degree to which mitigation measures are incorporated into the alternatives, are adequately studied as to effectiveness, and are effective in reducing the likelihood that the species would be affected significantly.[83] For this Project, an EIS is the appropriate vehicle to analyze particularly the significant and highly uncertain cumulative impacts and the highly uncertain effectiveness of possible mitigation measures.

As discussed above, analyzing the effect of the Project, alone and when added to other threats, on the likelihood of survival and recovery of the species as a whole is critical. The Service's evaluation of the Project's impacts must, however, go beyond the impact to the species: the impacts to the local "environment" and the local Indiana bat population also must be evaluated. An example of how Project impacts must be evaluated at multiple spatial scales is presented by the Ninth Circuit's decision in *Anderson v. Evans*.[84] The *Anderson* court required an EIS rather than an EA where the effects of whaling on a small group of gray whales was highly uncertain, despite certainty that the project would have no significant effect on the broader gray whale population. The court explained:

> What is in hot dispute is the possible impact on the whale population in the local area where the Tribe wants to hunt. * * *
>
> The government agrees that a relatively small group of whales comes into the area of the Tribe's hunt each summer, and that about sixty percent of them are returning whales (although, again, not necessarily whales returning annually). Even if the eastern Pacific gray whales overall or the smaller PCFA group of whales are not significantly impacted by the Makah Tribe's whaling, the summer whale population in the local Washington area may be significantly affected. Such local effects are a basis for a finding that there will be a significant impact from the Tribe's hunts. See 40 C.F.R. § 1508.27(a). Thus, if there are substantial questions about the impact on the number of whales who frequent the Strait of Juan de Fuca and the northern Washington Coast, an EIS must be prepared. The crucial question, therefore, is whether the hunting, striking, and taking of whales from this smaller group could significantly affect the environment in the local area. The answer to this question is, we are convinced, both uncertain and controversial within the meaning of NEPA. No one, including the government's retained scientists, has a firm idea what will happen to the local whale population if the Tribe is allowed to hunt and kill whales pursuant to the approved quota and Makah Management Plan. There is at least a substantial question whether killing five whales from this group either annually or every two years, which the quota would allow, could have a significant impact on the environment.[85]

[83] *Id*.
[84] *Anderson*, 371 F.3d at 490-92.
[85] *Id*. at 489-90.

An EIS is the appropriate vehicle for the analysis of this Project's impacts on the Indiana bat for the following reasons:

- Our current understanding of how Indiana bats are likely to interact with wind power facilities is rudimentary and characterized by high uncertainty, and at least a subset of the existing identified information gaps need to be filled before an accurate risk assessment can be completed for this Project.
- The effectiveness of potential mitigation measures for this Project is highly uncertain.
- This Project and ITP application are but the beginning of a wave of similar projects and ITP applications as wind power development surges forward, and how these early NEPAs and ITPs are handled will set a precedent for future wind energy projects.
- Indiana bat populations are at risk of being decimated by White Nose Syndrome combined with other identified threats, the cumulative impact of these threats is significant, and this Project's proposed incremental addition to Indiana bat mortality and reduced reproductive potential must be rigorously analyzed and mitigated.

Thank you for considering our comments.

Sincerely,

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