IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

ANIMAL WELFARE INSTITUTE, *et al.*,	*	
Plaintiffs	*	
v.	*	Case No.: RWT 09cv1519
BEECH RIDGE ENERGY LLC, *et al.*,	*	
Defendants.	*	

MEMORANDUM OPINION

Roger W. Titus
United States District Judge

TABLE OF CONTENTS

CALVIN: My report is on bats. . . . Ahem . . . "Dusk! With a creepy, tingling sensation, you hear the fluttering of leathery wings! Bats! With glowing red eyes and glistening fangs, these unspeakable giant bugs drop onto . . ."

Bill Watterson, Scientific Progress Goes "Boink": A Calvin and Hobbes Collection 26 (Andrews and McMeel 1991) (explaining that "Bats aren't bugs!").

This is a case about bats, wind turbines, and two federal polices, one favoring protection of endangered species and the other encouraging development of renewable energy resources. It began on June 10, 2009, when Plaintiffs Animal Welfare Institute ("AWI"), Mountain Communities for Responsible Energy ("MCRE"), and David G. Cowan (collectively, "Plaintiffs") brought an action seeking declaratory and injunctive relief against Defendants Beech Ridge Energy LLC ("Beech Ridge Energy") and Invenergy Wind LLC ("Invenergy") (collectively, "Defendants"). Plaintiffs allege that Defendants' construction and future operation of the Beech Ridge wind energy project ("Beech Ridge Project"), located in Greenbrier County, West Virginia, will "take" endangered Indiana bats, in violation of § 9 of the Endangered Species Act ("ESA"), 16 U.S.C. § 1538(a)(1)(B).

One month after this action was initiated, Defendants filed an answer and brought a counterclaim for costs. The next day, Plaintiffs filed a motion for a preliminary injunction and Defendants thereafter filed an opposition. On July 14, 2009, the Court conducted a telephone status conference with the parties and set a hearing on the preliminary injunction motion for August 11, 2009, but requested that the parties advise the Court by August 4, 2009 whether they would consent to treat the hearing as one on

the merits, pursuant to Federal Rule of Civil Procedure 65(a)(2). On July 30, 2009, with consent of the parties, the Court consolidated the preliminary injunction hearing with a trial on the merits, rescheduled the hearing for October 21, 2009 and set an accelerated discovery and briefing schedule.[1] Defendants agreed to continue construction on only 40 of the 124 planned turbines, pending a disposition of the merits. The Court held a four-day trial on October 21-23, and 29, 2009.

I. The Endangered Species Act

Congress enacted the ESA in 1973 in response to growing concern over the extinction of animal and plant species. *See Gibbs v. Babbitt*, 214 F.3d 483, 487 (4th Cir. 2000). The text of the Act as well as its legislative history unequivocally demonstrate that Congress intended that protection of endangered species be afforded the highest level of importance. Congress concluded that threatened and endangered species "are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." 16 U.S.C. § 1531(a)(3). Accordingly, Congress passed the ESA "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of [certain enumerated] treaties and conventions" signed by the United States. 16 U.S.C. § 1531(b).

Not long after the passage of the Act, the Supreme Court in *Tennessee Valley Authority v. Hill* proclaimed that the ESA represented "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." 437

[1] The Court commends counsel for both parties for their professionalism and cooperation, comprehensive pretrial briefs, helpful joint pretrial factual stipulations, and their compelling presentations at trial, particularly in light of the expedited nature of these proceedings.

U.S. 153, 180 (1978) (enjoining the Tennessee Valley Authority from completing the Tellico Dam because creation of the reservoir would destroy the critical habitat of the snail darter, a three-inch long endangered fish). Chief Justice Burger, writing for the majority, observed that "examination of the language, history, and structure of the legislation under review here indicates beyond doubt that Congress intended endangered species to be afforded the highest of priorities," *id.* at 174, and that Congress' purpose "was to halt and reverse the trend toward species extinction, whatever the cost," *id.* at 184. More recently, the Fourth Circuit has similarly opined that the "overall federal scheme [of the ESA is] to protect, preserve, and rehabilitate endangered species, thereby conserving valuable wildlife resources important to the welfare of our country." *Gibbs*, 214 F.3d at 492 (upholding the constitutionality of a regulation that limited the taking of red wolves on private land).

Section 9 of the ESA, the cornerstone of the Act, makes it unlawful for any person to "take any [endangered] species within the United States." 16 U.S.C. § 1538(a)(1)(B). The ESA defines the term "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19).

The U.S. Fish and Wildlife Service ("FWS" or the "Service") has passed regulations implementing the ESA that further refine what activities constitute an impermissible "take." The regulations define the term "harass" as:

> an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

50 C.F.R. § 17.3. The regulations also define the term "harm" as:

> an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

Id. In 1981, the FWS added to its definition of the term "harm" the "word 'actually' before the words 'kills or injures' . . . to clarify that a standard of actual, adverse effects applies to section 9 takings." 46 Fed. Reg. 54,748, 54,750 (Nov. 4, 1981). *See also Babbitt v. Sweet Home Chapter of Communities for a Great Or.*, 515 U.S. 687, 703 (1995) (rejecting a facial challenge to invalidate the regulation and concluding that the Secretary's definition of harm to include habitat modification was consistent with "Congress' clear expression of the ESA's broad purpose to protect endangered and threatened wildlife").

Anyone who knowingly "takes" an endangered species in violation of § 9 is subject to significant civil and criminal penalties. 16 U.S.C. § 1540(a) (authorizing civil fines of up to $25,000 per violation); § 1540(b) (authorizing criminal fines of up to $50,000 and imprisonment for one year). In order to provide a safe harbor from these penalties, Congress amended the ESA in 1982 to establish an incidental take permit ("ITP") process that allows a person or other entity to obtain a permit to lawfully take an endangered species, without fear of incurring civil and criminal penalties, "if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." § 1539(a)(1)(B). Congress established this process to reduce conflicts between species threatened with extinction and economic development activities, and to encourage "creative partnerships" between public and private sectors. H.R. Rep. No. 97-835, at 30-31 (1982), *reprinted in* 1982 U.S.C.C.A.N. 2807, 2871-72. Some wind energy

companies have obtained or are in the process of pursuing ITPs. Joint Pretrial Factual Stipulations ¶ 24.

A person may seek an ITP from the FWS by filing an application that includes a Habitat Conservation Plan ("HCP"). *See* 16 U.S.C. 1539(a)(2)(A)(i)-(iv); *see also generally* 50 C.F.R. § 17.22. A HCP is designed to minimize and mitigate harmful effects of the proposed activity on endangered species.[2] Applicants must include in a HCP a description of the impacts that will likely result from the taking, proposed steps to minimize and mitigate such impacts, and alternatives considered by the applicant including reasons why these alternatives are not being pursued. 16 U.S.C. § 1539(a)(2)(A)(i)-(iv); *see also* 50 C.F.R. § 17.22(b). If an ITP is issued, the FWS will monitor a project for compliance with the terms and conditions of a HCP, as well as the effects of the permitted action and the effectiveness of the conservation program. 65 Fed. Reg. 35,242, 35,253-56 (June 1, 2000) (emphasizing the importance of periodic reports and field visits). The FWS may suspend or revoke all or part of an ITP if the permit holder fails to comply with the conditions of the permit or the laws and regulations governing the activity. 50 C.F.R. §§ 13.27, 13.28.

Congress also provided under Section 11 of the ESA that "any person" may bring a citizen suit in federal district court to enjoin anyone who is alleged to be in violation of the ESA or its implementing regulations. 16 U.S.C. § 1540(g).[3] Congress included this provision to encourage private citizens to force compliance with the Act for the benefit of

[2] A HCP also provides regulatory certainty to permit holders. Under its "No Surprises" policy, the FWS assures private landowners that it will not impose additional restrictions on the use of natural resources or the implementation of mitigation measures beyond what is provided for under a properly functioning HCP. *See, e.g.*, 65 Fed. Reg. 35,242. 35,242-43 (June 1, 2000).

[3] The ESA defines the term "person" as, *inter alia*, "an individual, corporation, partnership, trust, association, or any other private entity . . . ." 16 U.S.C. § 1532(13).

the public interest. Bennett v. Spear, 520 U.S. 154, 165 (1997) ("[T]he obvious purpose of the particular provision in question is to encourage enforcement by so-called 'private attorneys general'- evidenced by its elimination of the usual amount-in-controversy and diversity-of-citizenship requirements, its provision for recovery of the costs of litigation (including even expert witness fees), and its reservation to the Government of a right of first refusal to pursue the action initially and a right to intervene later.").

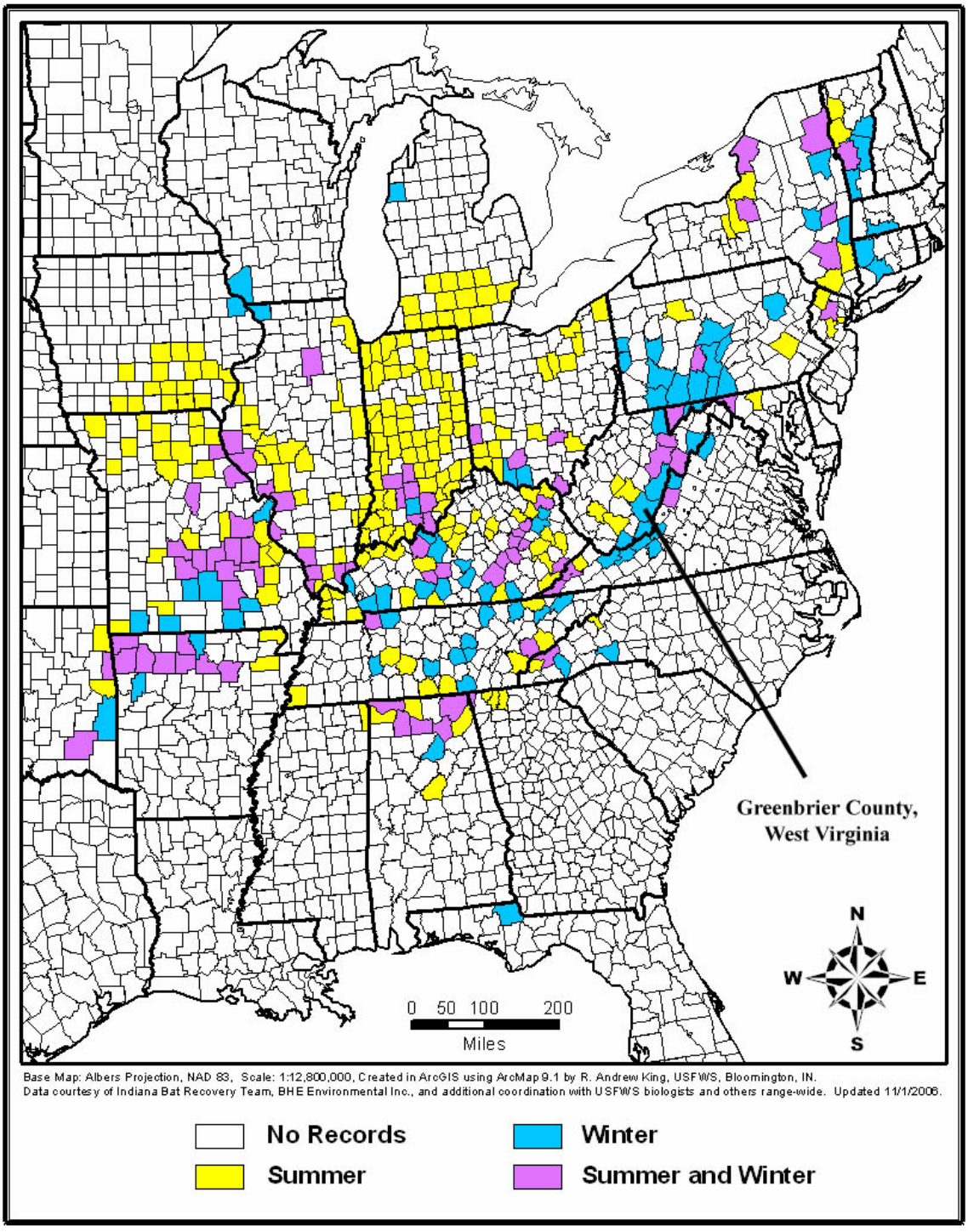
The ESA's plain language, citizen-suit provision, legislative history, and implementing regulations, as well as case law interpreting the Act, require that this Court carefully scrutinize any activity that allegedly may take endangered species where no ITP has been obtained.

II. The Indiana Bat

The FWS originally designated the Indiana bat (*Myotis sodalis*) as in danger of extinction in 1967 under the Endangered Species Preservation Act of 1966, the predecessor to the ESA. 32 Fed. Reg. 4,001 (Mar. 11, 1967). The species has been listed as endangered since that time. Joint Pretrial Factual Stipulations ¶ 8. The Indiana bat is in the genus *Myotis* and shares some morphological similarities with other *Myotis* species. *Id.* ¶ 9. It closely resembles the little brown bat (*Myotis lucifugus*) and the northern long-eared bat (*Myotis septenrionalis*). U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 15 (Apr. 2007) (Pls.' Ex. 52). An Indiana bat weighs approximately one quarter of an ounce (approximately seven grams), *see* Joint Pretrial Factual Stipulations ¶ 9, its forearm length is 1 3/8 inches to 1 5/8 inches (35-41 millimeters), U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery

Plan: First Revision 15 (Apr. 2007) (Pls.' Ex. 52), and its head and body length is 1 5/8 inches to 1 7/8 inches (41-49 millimeters), *id*.

The current range of the Indiana bat includes approximately twenty states in the mid-western and eastern United States, including West Virginia. Joint Pretrial Factual Stipulations ¶ 10. The following map, last updated November 1, 2006 and included in the current FWS Indiana Bat Draft Recovery Plan, illustrates the distribution of counties with known summer and winter records of the Indiana bat:



U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 19 (Apr. 2007) (Pls.' Ex. 52).[4]

[4] The Court added to the map a label identifying Greenbrier County, West Virginia, the location of the Beech Ridge Project.

The Indiana bat population has declined since it was listed as an endangered species in 1967, and was estimated by the FWS in 2007 at approximately 468,184. *Id.* ¶ 11. However, research suggests that the West Virginia population of hibernating Indiana bats has increased since 1990, with an estimated current population of about 17,000. *Id.* ¶ 12. Approximately three percent of Indiana bats are located in West Virginia. U.S. Fish and Wildlife Serv., Revised 2007 Rangewide Population Estimate for the Indiana Bat, *Myotis sodalist*, at *1 (Oct. 15, 2008) (Defs.' Ex. 16).

The Indiana bat is an insectivorous, migratory bat whose behavior varies depending on the season. In the fall, Indiana bats migrate to caves, called hibernacula. The bats engage in a "swarming" behavior in the vicinity of the hibernacula, which culminates in mating. Joint Pretrial Factual Stipulations ¶ 19. Indiana bats ordinarily engage in swarming within five miles of hibernacula, but may also engage in swarming beyond the five mile radius. *Id.* During swarming, the bats forage for insects in order to replenish their fat supplies. U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 40 (Apr. 2007) (Pls.' Ex. 52). In mid-November, Indiana bats typically enter hibernation and remain in hibernacula for the duration of winter. Joint Pretrial Factual Stipulations ¶ 20.

In April and May, Indiana bats emerge from hibernation. *Id.* ¶ 13. After engaging in "staging," typically within five miles of the hibernacula, they fly to summer roosting and foraging habitat. *Id.* ¶ 13. In the summer, female Indiana bats form maternity colonies in roost trees, where they give birth to "pups," and raise their young. *Id.* ¶ 14. Studies suggest that reproductive female Indiana bats give birth to one pup each year. *Id.* ¶ 15. Male Indiana bats spend their summers alone or in small temporary

groups in roost trees, changing roost trees and locations throughout the summer. *Id.* ¶ 17. Roost trees generally consist of snags, which are dead or dying trees with exfoliating bark, or living trees with peeling bark. *Id.* ¶ 17.

Like other bats, Indiana bats navigate by using echolocation. Trial Tr. 134:2-14, Oct. 21, 2009 (Gannon). Specifically, bats emit ultrasonic calls and determine from the echo the objects that are within their environment. *See, e.g.*, Donald R. Griffin, Echoes of Bats and Men 84-95 (Anchor Books 1959). Call sequences are typically composed of multiple pulses. *Id.* at 85-87.

The FWS published the original recovery plan for the Indiana bat in 1983 and a draft revised plan in 1999. In April 2007, the FWS published the current Draft Recovery Plan. *See* U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision (Apr. 2007) (Pls.' Ex. 52). The current plan provides substantial background information regarding the behavior of the Indiana bat and the many threats that endanger the species. *See id*. at 7-8. The plan also sets forth a recovery program designed to protect the Indiana bat and ultimately remove it from the Federal List of Endangered and Threatened Wildlife. *See id*. at 8.

III. Wind Turbines and Bat Mortality

Research shows, and the parties agree, that wind energy facilities cause bat mortality and injuries through both turbine collisions and barotrauma. Joint Pretrial Factual Stipulations ¶ 21; *see also* U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 101 (Apr. 2007) (Pls.' Ex. 52); Edward B. Arnett et al., *Patterns of Bat Fatalities at Wind Energy Facilities in North America*, 72 J. of Wildlife Mgmt. 61, 61-78 (2008) (Pls.' Ex. 31). Barotrauma is damage caused to

enclosed air-containing cavities (e.g., the lungs, eardrums, etc.) as a result of a rapid change in external pressure, usually from high to low. Joint Pretrial Factual Stipulations ¶ 21. The majority of bat mortalities from wind energy facilities has occurred during fall dispersal and migration, but bat mortalities have also occurred in the spring and summer. Joint Pretrial Factual Stipulations ¶ 23. At the Mountaineer wind energy facility in West Virginia, which is located approximately 75 miles from the Beech Ridge Project, a post-construction mortality study resulted in an estimated annual mortality rate of 47.53 bats per turbine. *Id.* ¶ 22.

The construction of wind energy projects may also kill, injure, or disrupt bat behavior. For example, the cutting of trees may kill or injure roosting bats and destroy potential roosting sites.[5] *See, e.g.*, BHE Envtl., Inc., Chiropteran Risk Assessment 31-32 (June 19, 2006) (Pls.' Ex. 126); *House v. U.S. Forest Serv.*, 974 F. Supp. 1022,1032 (E.D. Ky. 1997) (finding that the cutting of trees will destroy Indiana bat roosting habitat).

IV. The Beech Ridge Project

Defendant Invenergy is the fifth largest wind developer in the United States, with an aggregate wind-energy generating capacity of nearly 2,000 megawatts. Pretrial Factual Stipulations ¶ 2. Beech Ridge Energy, a wholly-owned subsidiary of Defendant Invenergy, intends to construct and operate 122[6] wind turbines[7] along 23 miles of Appalachian mountain ridgelines, in Greenbrier County, West Virginia. Joint Pretrial

[5] Construction may also create new habitat, specifically foraging areas and travel corridors, that will attract Indiana bats. *See infra* Part XI.B.

[6] Defendants originally proposed to construct 124 turbines. The current plan is for 122 turbines.

[7] Each turbine has an anemometer (to measure wind speed) and a wind vein (to measure wind direction). Trial Tr. 140:3-15, Oct. 22, 2009 (Groberg). The yaw motor turns the rotor into the wind. *Id.* When the wind speed reaches the predetermined cut-in speed, the blades feather (pitch) into the wind, causing the blades to turn and produce electricity. *Id.*

Factual Stipulations ¶ 26; *see also* Beech Ridge Energy LLC, No. 05-1590-E-CS, 2006 W. Va. PUC LEXIS 2624, at *2 (W. Va. Pub. Serv. Comm'n Aug. 28, 2006). The first phase of the project currently consists of 67 turbines and the second phase consists of 55 turbines. Joint Pretrial Factual Stipulations ¶ 48.

The footprint for the transmission line will be approximately 100 acres and the footprint for the wind turbines will be approximately 300 acres. *See* Beech Ridge Energy LLC, No. 05-1590-E-CS, 2006 W. Va. PUC LEXIS 2624, at *2 (W. Va. Pub. Serv. Comm'n Aug. 28, 2006); *see also* Trial Tr. 125:15-23, Oct. 22, 2009 (Groberg) (stating that the total footprint is approximately 400 acres). The lowest turbines are located at an elevation of approximately 3,650 feet above sea level and the highest are at approximately 4,350 feet. Beech Ridge Turbine Elevations (Defs.' Ex. 116); *see also* Trial Tr. 139:8-13, Oct. 22, 2009 (Groberg). The towers are 263 feet tall and the rotors have a diameter of 253 feet. *Id.* at 139:15-17 (Groberg). When the blade is pointing straight up at twelve o'clock, the turbine is 389 feet tall, *id.* at 139:18-19 (Groberg), and when the blade is pointing straight down at six o'clock, the bottom point of the blade is 137 feet off the ground, *id.* at 139:20-21 (Groberg).

The Beech Ridge Project will cost over $300 million to build and will produce 186 megawatts of electricity, equivalent to the amount of electricity consumed by approximately 50,000 West Virginia households in a typical year.[8] *Id.* at 146:11-20 (Groberg). The project is projected to operate for a minimum of twenty years. Joint Pretrial Factual Stipulations ¶ 28. Invenergy has signed a twenty-year contract with

[8] These estimates were derived based on the assumption that the project would consist of 124 turbines, as set forth in the original plan. Trial Tr. 146:11-20, Oct. 22, 2009 (Groberg). The amount of electricity produced by the Beech Ridge Project will be slightly lower than 186 megawatts if only 122 turbines are operational, as under the current plan. *Id.*

Appalachian Power Company to sell all output from the first 105 megawatts of power. Trial Tr. 144:25-145:6, Oct. 22, 2009 (Groberg). Sixty-seven turbines, the number of turbines in the first phase of the project, are required to produce this amount of electricity. *Id.* at 144:25-145:23 (Groberg).

V. The Beech Ridge Project Development History and Environmental Studies

In 2005, David Groberg, Vice President of Business Development for Invenergy and the lead developer of the Beech Ridge Project, hired BHE Environmental, Inc. ("BHE") as environmental consultant to the Beech Ridge Project. BHE provides a variety of services to its clients, including agency coordination, study design and implementation, biological assessment and HCP preparation, as well as expert witness services. Letter from Russ Rommé, Director, BHE Envtl., Inc., to David Groberg, Invenergy LLC (Apr. 14, 2005) (Pls.' Ex. 88). Russ Rommé, then Director of the Natural Resources Group at BHE, became the BHE project manager and was responsible for, among other things, assessing potential risks to bat species at the Beech Ridge Project site and consulting with state and federal regulatory agencies.

In July 2005, Rommé contacted Frank Pendleton, an employee at the FWS Field Office in Elkins, West Virginia ("FWS West Virginia Field Office"). Rommé then wrote an e-mail to Pendleton to "create a record of our phone conversation," in which Pendleton told Rommé that BHE's proposal to conduct a preconstruction bat presence survey consisting of fifteen mist-net[9] sites "was a reasonable level of effort" but with the

[9] Mist nets are made of fine material, have small sized mesh, and are typically 2.6 meters high and 3 to 15 meters long. Trial Tr. 158:21-24, Oct. 21, 2009 (Robbins) (explaining that nets can be stacked on top of each other to fit the habitat); *see also* Trial Tr. 170:24-171:9, Oct. 22, 2009 (Slack) ("It's almost like a giant hair net. It's a really fine material, and these are hooked to pulley ropes, typically, and are put up on ropes, or put up on poles 20 to 30 [feet] high, anywhere between 20 and 60 [feet] wide in corridors to catch bats as they're traveling or foraging in the corridor."). Bats fly into mist nets and become entangled, allowing researches to capture bats, identify their species, and release them.

specific caution that the proposed mist-netting survey would *only* reflect the presence of bats in the area during the *summer*.[10] E-mail from Frank Pendleton, U.S. Fish and Wildlife Serv., to Russ Rommé, Director, BHE Envtl., Inc. (July 19, 2005, 8:25 AM) (Defs.' Ex. 68). Pendleton also stated that Thomas Chapman, Field Supervisor at the FWS West Virginia Field Office, would have the lead on any further discussions with the FWS regarding the Beech Ridge Project. *Id.*

From July 22-26, 2005, BHE conducted a mist-net survey at fifteen sites near proposed turbine locations. Joint Pretrial Factual Stipulations ¶ 34. The summer survey consisted of sixty-two net nights, BHE Envtl., Inc., Chiropteran Risk Assessment 11 (June 19, 2006) (Pls.' Ex. 126), and was conducted during full moon or near full moon conditions, Joint Pretrial Factual Stipulations ¶ 35. At the time, the FWS recommended a minimum of three net nights per site, a minimum of two net locations at each site, and a minimum of two nights of netting. U.S. Fish and Wildlife Serv., Agency Draft, Indiana Bat (*Myotis sodalis*) Revised Recovery Plan 52-53 (Mar. 1999) (Defs.' Ex. 18).

During the July survey, BHE captured a total of seventy-eight bats, representing six species. BHE Envtl., Inc., Chiropteran Risk Assessment 11 (June 19, 2006) (Pls.' Ex. 126); *see also* BHE Envtl., Inc., Mist-Net Surveys at the Proposed Beech Ridge Wind Farm 5-10 (Aug. 2005) (Defs.' Ex. 113). Among those bats captured were post-lactating females and juveniles of *Myotis* species. Joint Pretrial Factual Stipulations ¶ 40. Several bats escaped prior to being identified, including at least one *Myotis* species. *Id*. BHE captured no Indiana bats in the mist nets. *Id.* ¶ 34.

[10] Although the majority of bat mortalities at wind farms occur during fall dispersal and migration, Joint Pretrial Factual Stipulations ¶ 23, *no surveys were ever conducted by BHE during the fall*.

On November 1, 2005, Beech Ridge Energy applied to the West Virginia Public Service Commission ("WV PSC" or the "Commission") for a siting certificate to construct a wind-powered generating facility at the Beech Ridge Project site. Beech Ridge Energy LLC, No. 05-1590-E-CS, 2006 W. Va. PUC LEXIS 2624, at *1 (W. Va. Pub. Serv. Comm'n Aug. 28, 2006). Shortly thereafter, BHE provided the FWS and the West Virginia Department of Natural Resources ("WV DNR") a draft Chiropteran[11] Risk Assessment. Joint Pretrial Factual Stipulations ¶ 41.

Based on post-construction mortality studies conducted at the Mountaineer wind energy facility, the draft Chiropteran Risk Assessment estimated that the Beech Ridge Project will cause approximately 6,746 annual bat deaths as the result of turbine collisions.[12] BHE Envtl., Inc. *Chiropteran Risk Assessment*, 22 (Nov. 9, 2005) (Pls.' Ex. 125). The draft Chiropteran Risk Assessment also raised the possibility that Indiana bats are present at the Project site and that they may be injured or killed by the turbines once they are in operation:

> The proposed Beech Ridge site presents potential concerns in that it is proximate to Indiana bat hibernacula, sites where Indiana bats have been identified in the summer, and caves used in winter and summer by Virginia big-eared bats. Proximity of these species occurrences increases the likelihood the species will be present in the project area and have potential to collide with turbine blades during spring, summer, or fall. . . .
>
> With Indiana bat hibernacula in Greenbrier County, and in other nearby counties[,] it is likely male Indiana bats are present in the county during summer, but are as of yet

[11] Bats are mammals in the order Chiroptera.

[12] If BHE's estimate is correct, the Beech Ridge Project will have a higher annual bat mortality rate than any other wind power project in the United States. Trial Tr. 135:1-9, Oct. 23, 2009 (Rommé); *see also* Trial Tr. 46:4-22, Oct. 22, 2009 (Kunz) (opining that BHE's prediction might be a gross underestimate and that based on a paper that he is reviewing for publication, the number of bat deaths may be twice as many – equal to 270,000 killed over the minimum twenty-year life of the Beech Ridge Project).

> undetected. Considering known proximate locations of summer and winter occurrences of Indiana bats, it is reasonable to presume individuals of this species move through Greenbrier County in spring and fall. It is unlikely female and juvenile Indiana bats will occupy the project area during summer. Thermal conditions in the project are less than ideal, and may be entirely unsuitable for use by females and young.

Id. at 22, 25 (internal citations omitted).

On November 10, 2005, BHE and Invenergy participated in a conference call with Barbara Douglas, from the FWS, and Craig Stihler, from the WV DNR. Meeting Minutes, Conference Call Regarding Beech Ridge Windpower Project (Nov. 10, 2005) (Pls.' Ex. 101). The meeting minutes indicate that after a preliminary review of the mist-net report, the regulators believed that BHE properly conducted the *summer* mist-net survey and that the clearing of land is unlikely to adversely affect Indiana bat *maternity colonies*. *Id.* at *2.

However, the meeting minutes also reveal that the regulators believed that potential impact on "migrating and swarming Ibats [Indiana bats] will still need to be addressed," *id.*, and that they remained concerned about the risks posed by the Beech Ridge Project to Indiana bats:

> Service/WVDNR both indicated that based on the proximity of this project to a large number of caves, including known Ibat hibernacula, there is an increased risk of high bat/Ibat mortality when compared to other projects. *We recommended pre-construction site specific studies to evaluate potential impacts. The company seemed unwilling to do this,* citing their proposed construction schedule and lack [of] alternative sites given the amount of investment at this site that has already been expended. We discussed the potential that pre-siting surveys could indicate that the turbines on a particular ridge or area could have increased potential for mortality and these areas could be dropped or modified. . . . WV DNR indicated that they were unwilling

> to accept a project that had unquantified (but likely high) resource impacts without a commitment to minimize. Service explained that if post-construction monitoring documented take of endangered species, company would be liable under ESA, project could be shut down, etc.

Id. at *2-3 (emphasis added).

From March 2-7, 2006, BHE conducted a cave survey, examining data on 140 caves and visiting 24 caves within five miles of the Beech Ridge Project. Joint Pretrial Factual Stipulations ¶ 43. Of these 24 caves, 12 were not surveyed by BHE because of flooding or blocked entrances. Trial Tr. 99:13-18, Oct. 23, 2009 (Rommé). BHE did not identify any Indiana bats in the 12 caves that it actually surveyed. Joint Pretrial Factual Stipulations ¶ 43.

On March 7, 2006, Chapman, the Field Supervisor of the FWS West Virginia Field Office and lead contact regarding the Beech Ridge Project, sent the first of three formal letters to Rommé. Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc. (Mar. 7, 2006) (Pls.' Ex. 97). The letter begins by summarizing the November 10, 2005 conference call, stating that during the teleconference the FWS and the WV DNR recommended preconstruction surveys as well as post construction minimization measures. *Id.* at 1 (suggesting feathering turbines and shutting down operations during migration periods). The Service remained concerned that Indiana bats may be adversely affected by construction and operation of the project, *id.* at 2-3, and "strongly encouraged [BHE] to continue to determine the temporal and spatial use of the project area by bats so that such use by bats can be reported to us and others prior to construction." *Id.* at 5. The FWS recommended "conducting multi-year studies (usually for three years)" as well as

springtime emergence studies. *Id.* The Service also stated that BHE should employ "[r]adar, thermal imaging, acoustical studies, mist-netting and other appropriate sampling techniques . . . ." *Id*.; *see also id.* ("Additional acoustical, radar, and spring emergence studies should still be conducted.").

In the wake of this letter, Rommé had a series of communications in March and April, 2006 with Christy Johnson-Hughes, a Senior Biologist in the FWS West Virginia Field Office.[13] Rommé claimed at trial that during a March 14, 2006 telephone call, Johnson-Hughes was "apologetic" for the contents of the March 7, 2006 letter from the FWS, explaining that much of the letter contained "boilerplate" language that had been inserted by the FWS Regional Office. Trial Tr. 111:16-112:9, Oct. 23, 2009; *see also* BHE Contact Report, Telephone Call Between Russ Rommé, Director, BHE Envtl., Inc., and Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv. (Mar. 14, 2006) (Defs.' Ex. 76).

Rommé also alleged that during a subsequent telephone call on April 6, 2006, Johnson-Hughes stated that the FWS considered Beech Ridge as a "lower risk" project, and that the developers should not be concerned about receiving negative input from the FWS if the project remained on track. Trial Tr. 113:2-14, Oct. 23, 2009; *see also* BHE Contact Report, Telephone Call Between Russ Rommé, Director, BHE Envtl., Inc., and Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv. (Apr. 6, 2006) (Defs.' Ex. 82). During this conversation, Johnson-Hughes also purportedly indicated that after the FWS reviewed the cave report and revised risk assessment, it would write a letter to the WV PSC indicating that it had no significant concerns regarding the project's

[13] Rommé testified at trial that during the first two years of his involvement with the Beech Ridge Project, he regularly communicated with the FWS, "like, several times a week." Trial Tr. 143:17-22, Oct. 23, 2009.

impact on threatened and endangered species. *Id.* Johnson-Hughes did not testify at trial and no written communications from her were received in evidence indicating that she was "apologetic" for the letters from her supervisor, Chapman, or that BHE should not be concerned about the negative input from the FWS.

Because Frank Pendleton had advised Rommé that Chapman would have the "lead" on further discussions with the FWS, the Court asked Rommé at trial whether he had spoken with Chapman. Rommé testified that he did not recall raising his concerns regarding any of the formal FWS letters directly with Chapman, their author, even though Chapman had signed the letters and was Johnson-Hughes' superior. Trial Tr. 159:11-161:14, Oct. 23, 2009 ("[T]he input I got from Christy [Johnson-Hughes] was that Tom [Chapman] was sort of stuck in the middle, and that he generally approved of the letters that Christy wrote. And then by the time those letters went up to the regional office and came back down, Tom did not have authority to change the letters.").

The WV PSC held two public hearings in Lewisburg, West Virginia, in April 2006. Beech Ridge Energy LLC, No. 05-1590-E-CS, 2006 W. Va. PUC LEXIS 2624, at *10 (W. Va. Pub. Serv. Comm'n Aug. 28, 2006). Several hundred people attended each hearing. *Id.* In May 2006, the Commission held six days of evidentiary hearings at its office in Charleston, West Virginia. *Id.* Beech Ridge Energy presented numerous witnesses, including Groberg and Rommé. *Id.* at *12-13.

From June 12-22, 2006, BHE conducted a second mist-net survey at twelve sites along the transmission line. Joint Pretrial Factual Stipulations ¶ 45 (stating that some of the mist-net sites on the western side of the project overlapped planned turbine locations); *see also* BHE Envtl., Inc., Mist-Net Surveys at the Proposed Beech Ridge Wind Energy

Transmission Line Corridor 1-7 (Sept. 27, 2006) (Defs.' Ex. 114). The survey consisted of 48 mist-net nights. Rommé Decl. ¶ 9 (Defs.' Ex. 5). Johnson-Hughes approved the number of mist-net sites and indicated that acoustic data collection would not be required for the transmission line survey. E-mail from Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv., to Kely Mertz, BHE Envtl., Inc. (May 10, 2006 10:06 AM) (Defs.' Ex. 85). As in 2005, BHE captured no Indiana bats during the 2006 mist-net survey, Joint Pretrial Factual Stipulations ¶ 45, and did not conduct any surveying, as recommended by the FWS, during fall dispersal and migration when a majority of bat mortalities occur.

On June 19, 2006, while the second mist-net survey was being conducted, BHE provided the FWS and the WV DNR a final Chiropteran Risk Assessment. *Id.* ¶ 46. The final Chiropteran Risk Assessment concluded that the Beech Ridge Project poses a low risk of harm to Indiana bats because the species is unlikely to be present at the site:

> Based upon the best available information, including almost exclusively negative results of summer mist net surveys for Indiana bats in West Virginia, and the elevation of the Beech Ridge site, the likelihood of an Indiana bat maternity colony in the project area is very low. However, considering the proximity of the project area to known and potential hibernacula, there is perhaps potential for presence of male Indiana bats roosting and or foraging within the project area during the summer, and migrating/staging/swarming individuals ultilizing the project area during spring and fall. There is one historic hibernaculum within 5 miles (8 km) (Bob Gee Cave), three active hibernacula (McFerrin Cave, Martha's Cave, and Snedegars Cave) between 5 and 10 miles (8 and 16 km) of the site. The site generally lies within a band of counties in which Indiana bats occur in the winter (or winter and summer), and is just to the east of two, and northeast of two West Virginia counties in which Indiana bats occur in the summer. These summer occurrences are limited to a single male Indiana bat in each county.

BHE Envtl., Inc., Chiropteran Risk Assessment 32 (June 19, 2006) (Pls.' Ex. 126) (internal citation omitted). The Chiropteran Risk Assessment assumed that no Indiana bats would be found during the second mist-net survey conducted along the transmission line. *Id.* at 32.

On July 27, 2006, Johnson-Hughes sent an e-mail to John Auville, Staff Attorney for the WV PSC assigned to the Beech Ridge Project, stating that the FWS wanted to provide recommendations to the WV PSC even though the submission deadline had expired. E-mail from Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv., to John Auville, Staff Attorney, West Virginia Public Service Commission (July 27, 2006, 8:46 AM) (Defs.' Ex. 87) (explaining that the FWS was unable to comment before the June 14, 2006 deadline because it did not receive BHE's final Chiropteran Risk Assessment until June 21, 2006). Johnson-Hughes indicated that although "Beech Ridge may be a lower risk site, it is not without risks to bats and birds," and that it was therefore important that the Service respond to these issues before the WV PSC made its final decision. *Id.* Auville replied that the Staff's role in the case was "finished," that the matter was before the WV PSC for decision, and that the Commission would likely treat any comments submitted by the FWS as public comment. E-mail from John Auville, Staff Attorney, West Virginia Public Service Commission, to Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv. (July 31, 2006, 2:13 PM) (Defs.' Ex. 87).

In response to BHE's final Chiropteran Risk Assessment, Chapman sent the second of three formal letters from the FWS West Virginia Field Office to Rommé on August 10, 2006. Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc. (Aug. 10,

2006) (Pls.' Ex. 98). The letter states that the FWS remained "concerned that the proposed Breech Ridge wind power project may harm or kill federally-listed Indiana bats (*Myotis sodalis*) . . . ."[14] *Id.* at 1. The FWS again recommended that BHE conduct a minimum of three years of pre-construction surveys and studies, as described in the Service's 2003 interim guidance, and conduct mist-net surveys during fall and spring migration. *Id.* at 1, 3. The Service also encouraged the developers to formulate and implement an adaptive management[15] plan to minimize the risk of harm to federally-listed species. *Id.* at 3 (describing possible mitigation techniques and post-construction mortality studies).

On August 28, 2006, the WV PSC issued an Order granting a siting certificate to Beech Ridge Energy for the construction and operation of 124 turbines at the Beech Ridge Project site. Beech Ridge Energy LLC, No. 05-1590-E-CS, 2006 W. Va. PUC LEXIS 2624, at *178-187 (W. Va. Pub. Serv. Comm'n Aug. 28, 2006). The WV PSC concluded that the evidence before it did not support a conclusion that Indiana bats live near the project site. *Id.* at *166-67 (reasoning that BHE captured no Indiana bats during its 2005 mist-net survey, that "Beech Ridge's witness" testified that Indiana bats do not typically swarm more than five miles from hibernacula, and that no Indiana bats were found in a historic hibernaculum located six miles from the closest turbine during surveys

[14] The letter also indicates that the FWS was concerned "about the cumulative impact of multiple wind power facilities on common bat species," especially given that BHE estimated that 6,746 bats will be killed by turbines during each year of operation of the Beech Ridge Project. Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director of Natural Resource Group, BHE Envtl., Inc., at 2 (Aug. 10, 2006) (Pls.' Ex. 98).

[15] Adaptive management is a process of iterative decision-making, with the aim to reduce uncertainty over time through monitoring. *See, e.g.*, 65 Fed. Reg. 35,242, 35,245 (June 1, 2000) ("For the purposes of the HCP program, we are defining adaptive management as a method for examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future conservation management actions according to what is learned."). In the context of wind turbines, adaptive management techniques may include, for example, changing the cut-in speed and feathering the blades to prevent the turbines from operating when Indiana bats are most likely to be present.

conducted in 2002 and 2006). Furthermore, the WV PSC declined to require three years of preconstruction studies because (i) the FWS's recommendation of three years of preconstruction studies was not mandatory and was articulated in interim guidance subject to revision; (ii) there was evidence that the recommendation was not being implemented across the nation; and (iii) the recommendation was made as public comment and not as evidence provided "under oath, tested through cross-examination, or . . . subject to rebuttal testimony." *Id.* at *176-77; *see also id.* at *165 ("The Commission agrees with Mr. Romm[é] that the pre-construction data is not particularly helpful in studying bat mortality."). Although the WV PSC quoted extensively the August 10, 2006 letter from the FWS to Rommé, *see id.* at *27-30 ("[M]ist net surveys should be conducted during fall and spring migration to understand the number and diversity of bats in the area, the Service wrote."), the Commission did not address in its findings of fact or conclusions of law the absence of any surveying during fall dispersal and migration as the FWS had recommended, *see generally id.* at *141-78. *Cf. id.* at *164-65 (concluding that multi-year preconstruction studies were not required despite the FWS recommendations, but failing to discuss seasonal disparities).

The WV PSC's Order granting the siting certificate contains numerous preconstruction and post-construction conditions, some of which address endangered species generally and bat mortality specifically. For example, in the event that a regulatory agency or court finds that the Beech Ridge Project has violated the ESA, the Order requires that Beech Ridge Energy notify the WV PSC within ten days of such a finding. *Id.* at *181-82. The Order states that the "Commission may seek any legal remedies it has authority to seek, including injunctive relief, to address any such

findings." *Id.* at *182. Moreover, the Order mandates that Beech Ridge Energy file with the Commission evidence of any required permits or certifications, including letters from the FWS and WV DNR indicating what actions, if any, it must undertake to be in compliance with relevant rules and regulations. *Id.* at *180-81. In addition, the Order states that Beech Ridge Energy must file evidence of approval of the "final endangered species study and any required mitigation plans . . . ." *Id.* at *181.

The Order also states in largely precatory language that Beech Ridge Energy "will consult" with a Technical Advisory Committee ("TAC") whose membership "shall be open" to the WV PSC, FWS, WV DNR, Bat and Wind Energy Cooperative, a statewide environmental organization, a statewide bird group, and a private or academic institution with experience in avian issues. *Id.* at *184. The Order states that Beech Ridge Energy "shall consult" with the TAC regarding, among other things, "[t]hree years of post-construction bat mortality and adaptive management studies, after operations commence, to assess 1) the project's impact, if any, upon bat life, 2) the *potential* for adaptive management techniques to mitigate such impacts, and 3) the expected costs over a range of mitigation effectiveness levels." *Id.* at *184-85(emphasis added); *see also id.* at *185-86 ("Beech Ridge's agreement to *test* adaptive management strategies shall be in effect immediately upon operation of the project. Beech Ridge may request modifications of its strategies in filings with the Commission." (emphasis added)). Furthermore, "[i]f the project causes *significant levels* of bat or bird mortality and adaptive management techniques are *proven effective and economically feasible*, Beech Ridge and its successors will make a *good faith effort to work with the Commission* to apply parameters to implement facility-wide adaptive management strategies on an on-going basis." *Id.* at

*185 (emphasis added). Beech Ridge Energy must also submit semi-annual reports to the Commission and the TAC on any post-construction studies that it conducts. *Id.*

On January 11, 2007, the WV PSC declined to reconsider its August 28, 2006 Order granting a siting certificate for the Beech Ridge Project. Beech Ridge Energy LLC, No. 05-1590-E-CS, 2007 W. Va. PUC LEXIS 97, at *1 (W. Va. Pub. Serv. Comm'n Jan. 11, 2007). The Commission rejected MCRE's argument that it is highly likely that an Indiana bat will be taken by the project, observing that "[t]here is no expert testimony consistent with this MCRE allegation" and that MCRE "creates this argument by combining several outermost possibilities from information contained in public comment." *Id.* at *73. The West Virginia Supreme Court of Appeals later affirmed the Commission's decision. Mountain Communities For Responsible Energy v. W. Va. Pub. Serv. Comm'n, 665 S.E. 2d 315, 485 (W. Va. 2008).

On June 5, 2007, Rommé sent a letter to Johnson-Hughes requesting that the FWS provide written confirmation that Beech Ridge Energy had complied with certain preconstruction conditions contained in the August 28, 2006 Order. Letter from Russ Rommé, Director, BHE Envtl., Inc., to Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv. (June 5, 2007) (Defs.' Ex. 95). One month later, Johnson-Hughes advised Rommé that her supervisor, Chapman, sent a draft letter to the FWS Regional Office for review. E-Mail from Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv., to Russ Rommé, Director, BHE Envtl., Inc. (July 11, 2007, 8:37 AM) (Defs.' Ex. 97). Johnson-Hughes told Rommé that she could not predict how the Regional Office would modify the letter, but noted that the Service's "solicitor is concerned about the Service being 'co-opted' into the PSC's process . . . ." E-Mail from

Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv., to Russ Rommé, Director, BHE Envtl., Inc. (July 11, 2007, 9:57 AM) (Defs.' Ex. 97) (noting that "I am not sure if [the solicitor] understands where we are with Beech Ridge"). Rommé replied that "this is really alarming and disappointing, given our previous and repeated coordination on this."[16] E-Mail from Russ Rommé, Director, BHE Envtl., Inc., to Christy Johnson-Hughes, Senior Biologist, U.S. Fish and Wildlife Serv. (July 11, 2007, 11:15 AM) (Defs.' Ex. 97).

On July 31, 2007, Chapman sent the third and final formal letter from the FWS West Virginia Field Office to Rommé regarding the Beech Ridge Project. Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc. (July 31, 2007) (Pls.' Ex. 99). The letter reiterates that the Service remained "concerned about annual and cumulative mortality of migratory bats . . . ." *Id.* at 2. Furthermore, the letter again states that one summer season of mist-netting surveys is likely insufficient to determine species presence:

> The Service has *consistently recommended use of several survey methods such as acoustical detectors*, thermal imagery, and radar. *Mist-netting, for example, by itself, and during one summer, is not robust in the case of wind energy projects in the opinion of the Service.* While Beech Ridge was within the PSC requirement for one year of preconstruction surveys, and the PSC accepted the surveys, the method [i.e., mist-netting] and time frame [summer season only] limited the baseline available for detecting species presence and use of the project air space over time.

[16] Rommé expressed his frustration in an email to Erik Duncan, an Invenergy LLC official, in which he wrote "[i]f you are in the mood, how about walking in the Elkins FWS office and giving Christy a big ole' smack across the back of her head?" E-Mail from Russ Rommé, Director, BHE Envtl., Inc., to Erik Duncan, Invenergy LLC (July 11, 2007, 4:34 PM) (Pls.' Ex. 69). Duncan replied, "I think I'm always in the mood to smack a few FWS and USACE [United States Army Corps of Engineers] employees, can never get anything due to their bureaucratic hierarchy." E-mail from Erik Duncan, Invenergy LLC to Russ Rommé, Director, BHE Envtl., Inc. (July 11, 2007, 9:44 PM) (Pls.' Ex. 69).

Id. (emphasis added). While expressing these reservations, the FWS noted that the decision to obtain an ITP under § 10 of the ESA "lies with the prospective applicant." *Id.* at 1. The Service indicated that it would like to participate in the TAC but that the agency will maintain its independence and ability to take remedial action if appropriate. *Id.* at 3 (explaining that such remedies may include enforcement of the ESA as well as recommendations that Beech Ridge Energy apply for an ITP).

On February 13, 2009, the WV PSC authorized construction at the Beech Ridge Project site, concluding that Beech Ridge Energy had satisfied the preconstruction conditions set forth in the Commission's August 28, 2006 Order.[17] Beech Ridge Energy LLC, No. 05-1590-E-CS, 2009 W. Va. PUC LEXIS 304, at *1 (W. Va. Pub. Serv. Comm'n Feb. 13, 2009). At the time of trial, foundations for 67 turbines had been poured, turbine deliveries had commenced, and transmission lines were being strung in agreed upon areas. Trial Tr. 175:6-13, Oct. 22, 2009 (Groberg). Beech Ridge Energy has not applied for an ITP which would allow it to incidentally take an endangered species. Joint Pretrial Factual Stipulations ¶ 54.

VI. Evidence Developed During Discovery

During discovery, significant new information came to light regarding the surveys conducted by BHE in the summer of 2005. Gary Libby, an employee of EcoTech, one of BHE's subcontractors, collected acoustic data using an AnaBat[18] detector at two of the

[17] On April 3, 2009, the WV PSC declined to reconsider its February 13, 2009 Order. Beech Ridge Energy LLC, No. 05-1590-E-CS, 2009 W. Va. PUC LEXIS 762, at *1 (W. Va. Pub. Serv. Comm'n Apr. 3, 2009). On September 2, 2009, the Supreme Court of Appeals of West Virginia refused MCRE's petition for appeal of the Commission's April 3, 2009 Order. *Mountain Communities for Responsible Energy v. W. Va. Pub. Serv. Comm'n*, No. 090674 (W. Va. Sept. 2, 2009).

[18] AnaBat detectors record ultrasonic sounds from approximately 200 kilohertz to 20 kilohertz within a 30 to 40 meter range. Trial Tr. 157:10-158:19, Oct. 21, 2009 (Robbins). These data files can be transferred to a computer for analysis. The ultrasonic pulses produced by bats for echolocation can be detected by AnaBat devices.

three mist-net sites for which he was responsible,[19] on July 24 and 26, 2005. Joint Pretrial Factual Stipulations ¶ 36. On July 24, over the course of approximately three hours, Libby recorded 68 files. Libby Dep. 101:13-102:4, Sept. 29, 2009 (Pls.' Ex. 130); *id.* at 111:6-112:10. On July 26, over the course of approximately one hour, Libby recorded 104 files. *Id.* at 108:13-19 ("I would have to consider that [a] large [number of files]. You know, often I don't get that many in an entire five hours."); *id.* at 112:11-114:16. Libby gave the electronic files containing the AnaBat data as well as his mist-net survey sheets to his employer, EcoTech. Joint Pretrial Factual Stipulations ¶ 37.

No one instructed Libby to use AnaBat detectors during the summer 2005 survey.[20] Libby testified at a deposition that he deployed the detector to supplement the mist nets because "it's just routine." Libby Dep. 97:24 (Pls.' Ex. 130). Libby learned how to use AnaBat by reading the manufacturer's instruction manual as well as a manual written by Eric Britzke, an expert on AnaBat technology. *Id.* at 37:14-25. Prior to 2005, Libby had five seasons of experience using AnaBat, *id.* at 124:16-17, and had worked on 15-20 projects where the technology was used, *id.* at 47:17-20. *See also id.* at 57:14-25 (explaining that some of these projects had involved the federal government).

BHE was aware that Libby had collected the acoustic data prior to this litigation but neither analyzed it nor provided it to the FWS or the WV DNR.[21] Joint Pretrial

[19] Libby conducted mist net surveys over a three-day period, but did not deploy AnaBat detectors on one of these days. Libby Dep. 96:7-97:11 (Pls.' Ex. 130).

[20] Groberg testified at trial that he did not prohibit BHE from performing acoustic detection, but that acoustic studies would be outside the scope of the work that BHE was hired to conduct. Trial Tr. 150:21-25, Oct. 22, 2009.

[21] Although the WV DNR has never received the acoustic data or BHE's analysis of it, BHE did provide to the regulator one of Libby's mist-net survey sheets from the 2005 survey that indicates that he recorded bat calls using AnaBat detectors at the Beech Ridge Project site. Gary Libby, WV Bat Survey Data Form, Site No. 13 (July 26, 2005) (Pls.' Ex. 119, Bates No. P-3108); *see also* Joint Pretrial Factual Stipulations ¶ 38

Factual Stipulations ¶ 39. Rommé wrote by hand on a draft report prepared by BHE in August 2005, that "BHE needs to possess the AnaBat files recorded @ the site. Can you imagine a call from EcoTech a yr from now saying 'we just go[t] around to analyzing the AnaBat calls and we think we recorded a *sodalis* [Indiana bat]. . . .'" BHE Envtl., Inc., Mist-Net Surveys at the Proposed Beech Ridge Wind Farm, at Bates No. BRINV000002771 (Aug. 2005) (Pls.' Ex. 122). Rommé explained at trial that he wanted to "be in control of that data" because he was the project manager, Trial Tr. 91:19-23, Oct. 23, 2009, and "one of my obligations as a consultant is I never want to surprise my client," *id.* at 146:3-5. *See also id.* at 146:24-147:4 ("[I]f that technology actually proved at some point in time to be reliable and produce data that could be relied upon, I surely didn't want my client getting a call out of the blue from another company saying, hey, we think we might have Indiana bats."). Rommé testified that BHE did not analyze the AnaBat data in 2005 because at the time there was no accepted process to analyze such data and BHE was not familiar with Libby's qualifications or how he calibrated and deployed the equipment. Trial Tr. 92:2-20, Oct. 23, 2009; *see also id.* at 146:8-13 ("So, when that data came in, recall that there is no technique to analyze it that's accepted by the regulatory agencies; that had been a topic of discussion in the bat community for years, and the anticipation was that at some time maybe that could be done.").

Libby not only collected acoustic data during the 2005 survey, but also he testified that the three mist-net sites for which he was responsible were not ideal for capturing bats.[22] Libby testified at his deposition that they were poor capture sites

(explaining that BHE provided the survey sheets to the WV DNR as part of its 2005 year-end reporting requirements).

[22] Several of Plaintiffs' experts also opined that some of the mist-net survey sites were poor locations because, for example, they lacked the requisite canopy cover to funnel the bats towards the net and block

because "there was no way to really get a bat to go in your net." Libby Dep. 74:11-13 (Pls.' Ex. 130). Libby explained that "you could literally, on a clear night, watch bats come up and fly over your net." *Id.* at 75:4-5; *see also id.* at 88:15-18 ("But when you have a net kind of sitting out there in the middle of nowhere, you're – you're really only going to get a very unlucky bat or a very stupid bat."); *id.* at 90:16-20 ("We know that a full moon or three-quarter moon isn't the best in terms of visibility, and that, coupled with a – a not so great site, is going to make it really hard to catch bats."). On Libby's original survey sheets for sites 9 and 13, he indicated that the sites were "too open." Gary Libby, Net Site Description, Site 9 (July 24, 2005) (Pls.' Ex. 119, Bates No. P-3084); Gary Libby, Net Site Description, Site 13 (July 25, 2005) (Pls.' Ex. 119, Bates No. P-3111). At BHE's request, Libby revised one of the sheets to provide more information.[23] Joint Pretrial Factual Stipulations ¶ 37. The original sheet, not the revised sheet, was provided to the WV DNR. Joint Pretrial Factual Stipulations ¶ 38.

---

moonlight. *See, e.g.*, Gannon Rebuttal Decl. ¶ 13 (Pls.' Ex. 2). In addition, several of Plaintiffs' experts stated that they would not have deployed mist nets on the days that BHE chose to conduct their surveys because moonlight reduces the likelihood of capturing bats. *See, e.g., id.*; Trial Tr. 74:10-75:15, Oct. 21, 2009 (Gannon) (same).

[23] The Joint Pretrial Factual Stipulations state that "[a]fter turning in *both* his mist-net survey sheets . . . an employee of BHE requested that Mr. Libby revise *one* of his mist-net survey sheets" and "Mr. Libby revised *the survey sheet* as requested." Joint Pretrial Factual Stipulations ¶ 37 (emphasis added). However, an e-mail dated August 10, 2005 from Kely Mertz, an employee at BHE, to Ryan Slack, an employee at EcoTech, requests that the subcontractor provide revised comments on *two* of Libby's survey sheets dated July 24, 2005 and July 25, 2005. E-mail from Kely Mertz, BHE Envtl., Inc., to Ryan Slack, EcoTech (Aug. 10, 2005, 2:57 PM) (Pls.' Ex. 121). Furthermore, Plaintiffs' Exhibit 120, which Plaintiffs describe as "Gary Libby's Revised Mist Net Survey Sheets (BRINV 2667 & 2695)," contains *two* sheets, one dated July 24, 2005 for Site 9 and another dated July 25, 2005 for Site 13. Both of these sheets contain text not found in Plaintiffs' Exhibit 119, "Mist Net Survey Sheets Sent to WV DNR (P-2013-3125)." *Compare* Gary Libby, Net Site Description, Site 9 (July 24, 2005) (Pls.' Ex. 119, Bates No. P-3084), *with* Gary Libby, Net Site Description, Site 9 (July 24, 2005) (Pls.' Ex. 120, Bates No. BRINV000002667); *compare* Gary Libby, Net Site Description, Site 13 (July 24, 2005) (Pls.' Ex. 119, Bates No. P-3111), *with* Gary Libby, Net Site Description, Site 13 (July 25, 2005) (Pls.' Ex. 120, Bates No. BRINV000002695). The record is therefore unclear whether BHE asked Libby to revise one or two sheets and whether Libby revised one or two sheets. However, resolution of this question is not essential to the outcome of this case.

VII. Jurisdiction

Although Defendants concede that the Court has jurisdiction over this case, "[t]he federal courts are under an independent obligation to examine their own jurisdiction." *United States v. Hays*, 515 U.S. 737, 742 (U.S. 1995) (internal quotation marks, brackets, and citation omitted). Plaintiffs must satisfy the standing requirement under Article III of the Constitution as well as the statutory jurisdictional prerequisites set out in the ESA.

The Supreme Court has held that the "irreducible constitutional minimum of standing" has three requirements: (1) actual or imminent injury that is concrete and particularized; (2) a causal connection between the injury and the conduct complained of; and (3) likelihood that a favorable decision will redress the injury. Lujan v. Defenders of Wildlife, 504 U.S. 555, 560-61 (1992). However, the prudential standing doctrine that a plaintiffs' grievance must fall within the zone of interests protected by the statute does not apply to the ESA due to the Act's citizen-suit provision. *Bennett v. Spear*, 520 U.S. 154, 162-66 (1997).

Plaintiffs here are: (i) AWI, a nonprofit animal protection organization that has 25,000 members and supporters, some of whom enjoy observing Indiana bats and recreating in Indiana bat habitat near the Beech Ridge Project site, Compl. ¶ 8; (ii) MCRE, a nonprofit community organization formed in 2005 with the publicly stated goal to "assess and disclose the impacts of a proposed wind energy facility in Greenbrier County," Joint Pretrial Factual Stipulations ¶ 5, and whose members live in and recreate in areas near the Beech Ridge Project site where Indiana bats are found, Compl. ¶ 14; and (iii) David G. Cowan, who lives approximately five miles from the Beech Ridge Project

site and derives scientific, educational, aesthetic, and recreational enjoyment from observing Indiana bats, Joint Pretrial Factual Stipulations ¶ 6, Compl. ¶ 16-17.

Plaintiffs have constitutional standing to bring this action under the ESA. First, Plaintiffs have injury in fact because the decline of the Indiana bat will negatively impact their use of Indiana bat caves and other Indiana bat habitat in the vicinity of the project site. Second, their injury is fairly traceable to Defendants' construction and operation of the wind turbines, which allegedly will kill and injure Indiana bats. Third, a favorable decision awarding injunctive relief will redress the injury by stopping construction or operation of the turbines, or both, thereby eliminating the risk posed to Indiana bats by the Beech Ridge Project.

Plaintiffs have also met the jurisdictional prerequisites set out in the citizen-suit provision of the ESA. 16 U.S.C. § 1540(g). Specifically, Plaintiffs qualify as "persons" as that term is defined under § 1532(13), and they gave at least sixty days written notice to the Secretary and Defendants, pursuant to § 1540(g)(2)(A)(i). *See* Letter from William S. Eubanks II et al., Meyer Glitzenstein & Crystal, to Invenergy et al. (Oct. 6, 2008) (Pls.' Ex. 10); Letter from William S. Eubanks II & Eric R. Glitzenstein, Meyer Glitzenstein & Crystal, to Invenergy LLC et al. (Mar. 5, 2009) (Pls.' Ex. 11). Moreover, under the ESA this Court retains jurisdiction "without regard to the amount in controversy or the citizenship of the parties." 16 U.S.C. § 1540(g)(1).

Accordingly, the Court has jurisdiction because Plaintiffs have standing to bring this action under the ESA and have met the jurisdictional prerequisites set out in the statute.

VIII. Wholly-Future Violations Under the ESA

Defendants argue that the ESA's citizen-suit provision bars actions alleging "wholly-future" violations of § 9 of the statute, where there is no past, current, or continuing "take." This is an issue of first impression in the Fourth Circuit.

At first glance, a superficial reading of the text of the ESA would appear to lend some support to Defendants' position. The citizen-suit provision employs the present tense, allowing a private party to commence a civil action against anyone "who is alleged to be *in violation of* any provision of this Act . . . ." 16 U.S.C. § 1540(g)(1)(A) (emphasis added). Defendants note that the Supreme Court and the Fourth Circuit have interpreted identical language in the citizen-suit provision of the Clean Water Act ("CWA"), 33 U.S.C. § 1365, and argue that these cases stand for the proposition that "there is no jurisdiction over claims of wholly future violations." Defs.' Surreply and Pre-Trial Br. at 2-3 (emphasis in original) (citing *Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Found., Inc.*, 484 U.S. 49 (1987) and *Am. Canoe Ass'n v. Murphy Farms*, 412 F.3d 536 (4th Cir. 2005)).

Defendants' reliance on the CWA cases is misplaced. In *Gwaltney of Smithfield, Ltd. v. Chesapeake Bay Found., Inc.*, the issue before the Supreme Court was whether the CWA confers jurisdiction over citizen suits for wholly-*past* violations. 484 U.S. at 54-56. Correlatively, in *American Canoe Association v. Murphy Farms*, the Fourth Circuit held that to establish jurisdiction under the CWA, a plaintiff must either prove violations that continue on or after the date the complaint is filed or show a likelihood of future recurrence of violations. 412 F.3d at 539. These CWA cases clearly do not address claims of wholly-future violations.

Moreover, the ESA's citizen-suit provision provides for injunctive relief which by design prevents *future* actions that will take listed species. Congress explained that citizen-suit actions allow any person "to seek remedies involving injunctive relief for violations or *potential* violations of the Act," H.R. Rep. 93-412 (1973) (emphasis added), suggesting that a historic violation is not necessary. The Court therefore concludes that the citizen-suit provision includes within its scope wholly-future violations of the statute.

The text of § 9 and its legislative history also indicate that Congress intended that the "take" provision be expansive in scope. By prohibiting any "attempt" to harm, wound, kill, or harass a listed species, 16 U.S.C. § 1532(19), Congress clearly manifested an intent that § 9 was designed to include claims of future injury. Furthermore, the Senate confirmed that the term "take" is defined "in the broadest possible manner to include every conceivable way in which a person can 'take' or attempt to 'take' any fish or wildlife." S. Rep. No. 93-307, at 7 (1973), *reprinted in* 1973 U.S.C.C.A.N. 2989, 2995. Protecting against the threat of imminent future harm is clearly consistent with Congress' broad definition of the term "take."

In addition, the Court finds that Defendants' interpretation of the ESA's citizen-suit provision as precluding claims for wholly-future violations is inconsistent with the very purpose of the Act. As discussed in *supra* Part I, Congress' intent when enacting the ESA was to protect and conserve threatened and endangered species, whatever the cost. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184 (1978). Requiring that a listed species be

harmed, wounded, killed, or harassed before conferring jurisdiction would thwart this central goal of the Act.[24]

Accordingly, the Court holds that the ESA's citizen-suit provision allows actions alleging wholly-future violations of the statute, where no past violation has occurred. The Court's holding is consistent with the text of the citizen-suit provision, the legislative history, the purpose of the ESA, as well as decisions from the Ninth Circuit squarely addressing the issue. *See Forest Conservation Counsel v. Rosboro Lumber Co.*, 50 F.3d 781, 783 (9th Cir. 1995) ("The language and legislative history of the ESA, as well as applicable case law support our holding today that a showing of a future injury to an endangered or threatened species is actionable under the ESA."); *Marbled Murrelet v. Pacific Lumber Co.*, 83 F.3d 1060, 1064-65 (9th Cir. 1996) (concluding that *Sweet Home* did not overrule *Rosboro* and that "an imminent threat of future harm is sufficient for the issuance of an injunction under the ESA").

IX. Requisite Degree of Certainty Under the ESA

Neither the Supreme Court nor the Fourth Circuit has yet had the opportunity to decide whether under § 9 of the ESA, a plaintiff must establish by a preponderance of the evidence[25] that the possibility of a take is likely or certain, or something in between. Plaintiffs urge the Court to apply ordinary principles of tort causation, which would require that they demonstrate that a take is merely more likely than not. Defendants

[24] Taking Defendants' argument to its logical (but absurd) conclusion, if there were only one mating pair of Indiana bats remaining in existence, the Court could only award injunctive relief under the ESA after one of the two bats had actually been killed - at which point the species would be doomed to extinction.

[25] The parties agree that the preponderance of the evidence standard, the usual burden of proof in civil cases, applies here. The question before the Court is what degree of certainty of harm is required under the ESA.

contend that Plaintiffs must prove by a preponderance of the evidence that the challenged activity is certain to harm, kill, or wound Indiana bats.[26]

Although the Act is silent as to the requisite degree of certainty for establishing a take under § 9, the FWS regulations implementing the ESA suggest that the standard for "harm" is higher than for "harassment." The regulations define the term "harass" as "an intentional or negligent act or omission which creates the *likelihood* of injury to wildlife by annoying it . . . ." 50 CFR § 17.3 (emphasis added). However, the term "harm" means "an act which *actually* kills or injures wildlife." *Id.* (emphasis added). The omission of the word "likelihood" and the insertion of the word "actually" in the latter definition suggest that a plaintiff must prove that harm is more than merely "likely" to occur.

The explanatory commentary to this regulation indicates that harm cannot be speculative. The FWS stated that it inserted the term "actually" before "kills or injures" because "existing language could be construed as prohibiting the modification of habitat even where there was no injury." 46 Fed. Reg. 54,748, 54,748 (Nov. 4, 1981). *See also* Babbitt v. Sweet Home Chapter of Communities for a Great Or., 515 U.S. 687, 708-9 (1995) (O'Connor, J., concurring) ("[T]he challenged regulation is limited to significant habitat modification that causes actual, as opposed to hypothetical or speculative, death or injury to identifiable protected animals."). The FWS further opined that the

[26] Defendants acknowledge that pursuant to FWS regulations, claims of harassment under § 9 require only "*likelihood* of injury." 50 CFR § 17.3 (emphasis added). However, Defendants argue that the concept of harassment is inapplicable in this case because (i) habitat modification is covered under "harm" and (ii) injury from barotrauma or turbine collisions are covered under "wound" or "kill." Defendants also assert that Plaintiffs' allegations regarding harassment are cursory and that they have failed to demonstrate that Defendants have acted intentionally or negligently as required by the relevant regulation. Because the Court concludes that Plaintiffs have established a § 9 take by satisfying the higher standard required for harm, wound, or kill, the Court need not reach Plaintiffs' arguments concerning harassment.

"redefinition sufficiently clarifies the restraints of section 9 so as to avoid injury to protected wildlife due to significant habitat modification, while at the same time precluding a taking where no actual injury is shown." 46 Fed. Reg. 54,748, 54,749 (Nov. 4, 1981).

Similarly, *Sweet Home* appears to suggest that mere likelihood of harm is insufficient under § 9. In *Sweet Home*, the Court held that the Secretary of the Interior did not exceed his authority when including *habitat modification and degradation* in the aforementioned regulation defining the term "harm." 515 U.S. at 707-8. Throughout the majority opinion, the Court, quoting the regulation, repeatedly stated that "actual" injury is required. *See, e.g.*, *id.* at 691 n.2 (explaining that the FWS amended the regulation "to emphasize that actual death or injury of a protected animal is necessary for a violation"); *id.* at 700 n.13 ("[E]very term in the regulation's definition of 'harm' is subservient to the phrase 'an act which actually kills or injures wildlife.'"). By underscoring the need for actual injury, the Court implied that harm cannot be hypothetical.[27]

Courts outside of the Fourth Circuit addressing the issue of the requisite degree of certainty of harm have articulated varying standards, and have not always distinguished between harm, kill, wound, and harass. *See, e.g.*, *House v. U.S. Forest Serv.*, 974 F. Supp. 1022, 1031-32 (E.D. Ky. 1997) ("[T]he Indiana bat's foraging habitat may be adversely affected by the Leatherwood Fork timber sale and thus may constitute a 'taking' of the Indiana bat, as the timber sale may harass and/or harm the Indiana bat in violation of the ESA.").

[27] *Sweet Home* involved a facial challenge to a regulation. The thrust of the opinion was that habitat modification or degradation alone, without injury, is insufficient. The issue presented here – the requisite degree of certainty required to establish a take – was not before the Court. Relevant language in the *Sweet Home* opinion is therefore helpful in resolving this question, but is not conclusive.

The First Circuit, for example, held in *American Bald Eagle v. Bhatti* that "[t]he proper standard for establishing a taking under the ESA, far from being a numerical probability of harm, has been unequivocally defined as a showing of 'actual harm.'" 9 F.3d 163, 165 (1st Cir. 1993) (rejecting the notion that "a one in a million risk of harm is sufficient to trigger the protections of the ESA"). The case involved a claim that American Bald Eagles would be harmed by a controlled deer hunt in a public forest because some of the wounded deer would not be recovered ("cripple-loss deer"), that they would die within the feeding area of the birds, and that bald eagles might be harmed by consuming lead in the deer carcasses. *Id.* at 164. Both the district court and the First Circuit found that the speculative risk of harm was insufficient to assert a claim under § 9 of the ESA.[28] *Id.* at 166; *see also id.* at 166 n.4 ("Appellants have not shown that bald eagles have ingested lead slugs nor fragments thereof during past hunts or will ingest lead slugs or fragments thereof during future hunts . . . .").

Because the risk of harm was highly speculative in *American Bald Eagle*, the First Circuit's observations regarding the degree of certainty of harm required by the ESA were not necessary to the decision. However, the Ninth Circuit, where most § 9 actions involving land-use activities have been brought, has squarely addressed the issue.

In *Marbled Murrelet v. Pacific Lumber Co.*, the Ninth Circuit required that a plaintiff establish a "reasonable certainty of imminent harm." 83 F.3d 1060, 1068 (9th Cir. 1996) ("The district court did not clearly err in finding marbled murrelets were nesting in Owl Creek and that there was a reasonable certainty of imminent harm to them

[28] The parties had stipulated, in the district court, that in order to prevail, they must show that the "deer hunt poses a significant risk of harm," but in dictum contained in a footnote, the First Circuit noted that "[b]y requiring the plaintiffs to show only 'a significant risk of harm' instead of 'actual harm,' the district court required a lower degree of certainty of harm than we interpret the ESA to require." *Id.* at 167 n.5.

from Pacific Lumber's intended logging operation."). Two years later, in *Defenders of Wildlife v. Bernal*, the court appeared to raise the standard, holding that plaintiffs "had the burden of proving by a preponderance of the evidence that the proposed construction *would* harm a pygmy-owl by killing or injuring it, or would more likely than not harass a pygmy-owl by annoying it to such an extent as to disrupt its normal behavioral patterns." 204 F.3d 920, 925 (9th Cir. 1998) (emphasis added). However, the Ninth Circuit did not state that it was departing from *Marbled Murrelet*, but instead clarified that in its previous decision it had held that "a *reasonably certain threat of imminent harm* to a protected species is sufficient for issuance of an injunction under section 9 of the ESA." *Id.* at 925 (emphasis added).

The Court agrees with the standard adopted in *Marbled Murrelet*, and holds that in an action brought under § 9 of the ESA, a plaintiff must establish, by a preponderance of the evidence, that the challenged activity is reasonably certain to imminently harm, kill, or wound the listed species.[29] To require absolute certainty, as proposed by Defendants, would frustrate the purpose of the ESA to protect endangered species before they are injured and would effectively raise the evidentiary standard above a preponderance of the evidence.[30] The reasonable certainty standard, in combination with the temporal component, is consistent with the purpose of the Act, its legislative history, the implementing regulations, and Supreme Court precedent.[31]

---

[29] Again, the Court need not decide the degree of certainty required to establish harassment under § 9 because the Court finds that Plaintiffs have met their burden as to harm, kill, or wound.

[30] Conversely, to require only a mere likelihood would have significant adverse consequences such as increasing project development costs and unduly burdening already limited court resources. The Court cannot conclude that Congress intended such results.

[31] Ultimately, the question of the applicable degree of certainty may be only of academic interest because the Court concludes, by a preponderance of the evidence, that the Beech Ridge Project is certain to imminently harm, kill, or wound Indiana bats. *See infra* Part XII. Plaintiffs have met the requisite standard

X. Factual Questions and Credibility of Trial Witnesses

The crucial issues in this case are whether Plaintiffs have proven by a preponderance of the evidence that (i) Indiana bats are present at the Beech Ridge Project site and (ii) the project is reasonably certain to imminently harm, kill, or wound Indiana bats, in violation of § 9 of the ESA. During the course of this litigation, the parties called as witnesses leading experts in their respective fields.

Plaintiffs called the following expert witnesses:[32]

Lynn Robbins, Ph.D.

Dr. Lynn Robbins received his doctorate in 1983 and has worked as a biologist, ecologist, and researcher for nearly three decades. He is currently a Professor of Biology at Missouri State University. He is a member of numerous professional scientific organizations, routinely publishes papers on bats in peer-reviewed scientific journals, and regularly gives presentations on bat related issues. Robbins has been working with Indiana bats for approximately 11 years. He is a leading expert in the use of AnaBat detectors to identify bat species. Robbins has worked with federal and state regulatory agencies as well as private companies to detect bat presence using acoustic data and mist nets. Over the course of his career, Robbins has worked with four different wind energy companies at five project sites.

The Court finds that based on his extensive credentials and testimony at trial, Robbins is a highly authoritative and compelling expert witness on bat biology, the Indiana bat, and acoustic analysis.

---

of proof whether the Court follows the Ninth Circuit, *see Marbled Murrelet v. Pacific Lumber Co.*, 83 F.3d 1060, 1068 (9th Cir. 1996), or the First Circuit, *see Am. Bald Eagle v. Bhatti*, 9 F.3d 163, 165 (1st Cir. 1993).

[32] Plaintiffs also called Gary Libby, by video deposition, as a fact witness.

Michael Gannon, Ph.D.

Dr. Michael Gannon received a Ph.D. in Biological Sciences and Ecology in 1991 from Texas Tech University. He is currently a Professor of Biology at Pennsylvania State University at Altoona. Gannon is a member of numerous professional scientific organizations, has co-published one book, published numerous book chapters, and routinely publishes papers in peer-reviewed scientific journals. Gannon has been working on bat issues for approximately 22 years and began working on Indiana bat issues in the mid-1990s. He started using acoustic equipment to detect bats in 1996 and has developed techniques to analyze acoustic data to identify bat species. Like Robbins, Gannon has worked with federal and state regulatory agencies as well as private companies to conduct presence surveys for bats, using mist nets and acoustic analysis. Gannon has also consulted on a number of wind energy projects.

The Court finds that, based on his substantial experience as well as his testimony at trial, Gannon is a very credible and persuasive expert witness on bat biology, the Indiana bat, and acoustic analysis.

Thomas Kunz, Ph.D.

Dr. Thomas Kunz received a Ph.D. in Systematics and Ecology in 1971 and has been working professionally as a biologist, ecologist, and researcher for four decades. He is currently a Professor of Biology at Boston University and the Director of the Center for Ecology and Conservation Biology. His primary research areas of interest include behavioral and psychological ecology, reproductive biology, evolution, and conservation of bats. Based on his extensive research on bats, he has written or edited six books and authored or co-authored over 200 articles in peer-reviewed scientific journals. Kunz has

testified before Congress, frequently participates in conferences, symposia, and panel discussions on bat issues, and is a member of numerous professional scientific organizations. Kunz has also conducted research and published several papers on bat mortality caused by wind energy development. Kunz is the leading expert in the field of bat ecology in the United States.[33]

Based on his extensive qualifications and trial testimony, the Court finds that Kunz is an extraordinarily knowledgeable and compelling expert witness on the subject of bat ecology.

Craig Stihler (By video deposition.)

Craig Stihler has been a biologist with the WV DNR since 1987. He is one of the leading bat biologists in West Virginia. Stihler sent a public comment letter to the WV PSC when Beech Ridge Energy was pursuing a siting certificate and he has been involved with the TAC. He testified at the video deposition not in his official capacity but rather as an expert in the field of bat studies.[34]

The Court finds that Stihler is very knowledgeable about bats, and particularly bat issues arising in West Virginia, but accords less weight to his mortality predictions of Indiana bats at the Beech Ridge Project site because his analysis and methodology were not subject to rigorous review and contained some obvious mathematical errors.

[33] In the third formal letter from the FWS to BHE, Chapman urged Rommé to consider an article written by Kunz, and even furnished a copy of the article to him. Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc., at 2 (July 31, 2007) (Pls.' Ex. 99).

[34] At trial, Defendants objected to those portions of Stihler's deposition testimony where he testified regarding certain statistical data and analysis because Plaintiffs neither disclosed Stihler as an expert nor furnished an expert report. Trial Tr. 79:24-84:15, 87:13-93:24, Oct. 22, 2009. The Court overruled the objection because failure to disclose Stihler as an expert was harmless under Federal Rule of Civil Procedure 37(c) and an expert report was not required under the circumstances. Trial Tr. 93:25-95:23, Oct. 22, 2009. With respect to the issue of whether Stihler had an adequate basis for one or more of his opinions, the Court concluded that any lack of foundation would go towards the weight the Court gives his testimony. *Id.* at 95:24-96:6.

Defendants called the following expert witnesses:[35]

Michael Lacki, Ph.D.

Dr. Michael Lacki received a Ph.D. in Zoology-Forestry in 1984 and has been working in the biology and wildlife management fields for 31 years. He is currently Professor and Interim Chair in the Department of Forestry at the University of Kentucky, where he teaches a variety of courses, including statistics. He has published over 125 peer-reviewed papers, monographs, technical reports, book chapters, and abstracts, as well as the leading book in the area of forest bats. He is also a member of numerous professional scientific organizations. Lacki's primary research interests are in diet, foraging behavior, and habitat use of forest-dwelling bats, which includes the Indiana bat.

The Court finds that, based on his extensive experience researching forest-dwelling bats, Lacki is a credible expert witness on bat biology and Indiana bat behavior. However, Lacki has not done a significant amount of research on wind turbines and bats. He is not an expert on acoustic analysis and he did not independently analyze the acoustic data in this case. Trial Tr. 271:14-19, Oct. 23, 2009 ("[Question:] And you're not an expert on acoustic analysis, are you? [Answer:] No, I do not use the technique."). Rather, he evaluated the methodologies used by Robbins and Gannon. *See, e.g.*, Lacki Second Supplemental Decl. ¶¶ 3-5 (Defs.' Ex. 3). As a result, the Court accords little weight to Lacki's testimony regarding acoustic analysis generally, but has considered his criticisms of the methodologies employed by Plaintiffs' experts to the extent that Lacki's opinions are logical and consistent with other testimony and evidence before the Court.

[35] Defendants also called as fact witnesses David Groberg, Vice President of Business Development for Invenergy, and Brook Slack, former biologist at BHE and current bat biologist at the Kentucky Department of Fish and Wildlife Resources.

Karen Tyrell, Ph.D.

Karen Tyrell received a Ph.D. in Biology in 1990. She has been on the faculty of two major universities and has developed training materials for federal and state environmental programs. During the last 30 years, she has designed and implemented scientific and applied studies that focus on the ecology and conservation of bats. Tyrell started working with the Indiana bat in 1985 and has served on the FWS Indiana Bat Recovery Team for the last 15 years. She has used various types of ultrasound detectors since 1983. She is currently a Senior Vice President at BHE and her principal duties include business development, project management, and staff development. Tyrell is also a member of several industry advisory committees addressing the environmental impacts of wind power facilities.

The Court finds that although Tyrell has significant experience in bat ecology, the credibility and weight of her testimony is diminished because she had little if any involvement at the Beech Ridge Project, her principal function is to actively market BHE's services to the wind power industry, and she is closely involved with the American Wind Energy Association, an advocacy group for the wind power industry.

Russ Rommé

Russ Rommé received a B.S. in Natural Resources/Wildlife Management in 1984. For the last 25 years, Rommé has been involved with the planning and management of programs and projects requiring ESA compliance. For nearly 20 years, he has focused on projects involving bats and much of his work since 1993 has involved the Indiana bat. He has participated as a biologist, project manager, regulatory compliance specialist, ESA Specialist, Senior Advisor, and Technical Review Team Leader on over 100

projects designed to detect the presence of Indiana bats. He has also worked on several wind energy projects over the last six years. Rommé is currently a Technical Director at BHE.

The Court finds that Rommé is the least credible of any witness in this case. It appears that Rommé, as the BHE Project Manager, was determined from the start to receive regulatory approval for the Beech Ridge Project. The Court is troubled, for example, that Rommé largely disregarded repeated formal letters from the FWS recommending additional preconstruction surveys and the use of acoustic detectors, that he never provided the AnaBat data to the FWS or WV DNR, and that he failed to analyze the data.

Having made these general credibility determinations of the parties' witnesses, the Court now turns to the factual issues in dispute.

XI. Presence of Indiana Bats at the Beech Ridge Project Site

When confronting the issue of whether Indiana bats are present at the Beech Ridge Project site, the parties analyzed a variety of factors, including: (i) the existence of hibernacula in the vicinity of the turbines; (ii) the physical characteristics of the Beech Ridge Project site; (iii) the mist-net data collected during the pre-construction surveys; and (iv) the acoustic data recorded by Libby.

A. Hibernacula

Plaintiffs argue that the existence of Indiana bat hibernacula near the Beech Ridge Project site increases the likelihood that the bats are present. However, Defendants contend that because the hibernacula are located more than five miles from the nearest turbines, Indiana bats are unlikely to be encountered at the site.

There are two hibernacula known to contain Indiana bats currently during the winter within ten miles of the project site.[36] Snedegar's Cave is located approximately 6.7 miles east of the nearest turbine. Joint Pretrial Factual Stipulations ¶ 29. In the winter of 2008, approximately 287 Indiana bats hibernated in Snedegar's Cave, and its population has increased 105% since 2002. *Id.* The cave was classified as a Priority 3 Indiana bat hibernaculum by the FWS in the 2007 Indiana Bat Draft Recovery Plan, which is defined as a cave that contains between 50 and 1,000 Indiana bats. *Id.* Slightly farther away is Martha's Cave, which is located approximately 9.6 miles east of the nearest turbine. Joint Pretrial Factual Stipulations ¶ 30. Approximately 251 Indiana bats hibernated in Martha's Cave in the winter of 2008, representing a 39% increase since 2002. *Id.* Like Snedegar's Cave, Martha's Cave is classified as a priority 3 Indiana bat hibernaculum. *Id.* In addition, there is at least one historic Indiana bat hibernaculum, Bob Gee Cave, located within five miles of the Beech Ridge project site, but according to BHE, no Indiana bats have recently been found at this cave. Trial Tr. 100:12-24, Oct. 23, 2009 (Rommé); BHE Envtl., Inc., Chiropteran Risk Assessment 25 (June 19, 2006) (Pls.' Ex. 126); Letter from Russ Rommé, Director, BHE Environmental, to David Groberg, Vice President of Business Development, Invenergy LLC, at 2-3 (April 6, 2006) (Defs.' Ex. 80).

[36] There was conflicting testimony as to whether, in comparison to the Beech Ridge Project, there is any existing wind power project in the United States (i) with a higher population of endangered bats within ten miles of the site and (ii) operating closer to a known Indiana bat hibernaculum. *Compare*, *e.g.*, Trial Tr. 142:24-143:1, Oct. 21, 2009 (Gannon) (stating "the hibernacula are closest to the project than any of the other ones I'm aware of"), *and* Trial Tr. 205:3-17, Oct. 21, 2009 (Robbins) (stating that the Beech Ridge Project has the highest population of Indiana bats within ten miles of the site and is the wind facility closest to a known Indiana bat hibernaculum), *with* Trial Tr. 104:1-13, Oct. 23, 2009 (Rommé) (stating that based on recent data from Stihler, there are 780 Indiana bats within ten miles of the Mountaineer wind energy facility), *and* Trial Tr. 104:17-24, Oct. 23, 2009 (Rommé) (testifying that there is at least one Indiana bat hibernaculum within 3.5 miles of the Meyerside Wind Project in Pennsylvania). The Court finds that these comparisons to other wind energy facilities are of some, but nevertheless limited, relevance as to the issue of whether Indiana bats are present at the Beech Ridge Project site.

Hellhole Cave, the largest known Indiana bat hibernacula in West Virginia, is located 75 miles northeast of the nearest Beech Ridge project turbine. Joint Pretrial Factual Stipulations ¶ 31. It has a population of approximately 11,900 hibernating Indiana bats and is classified as a priority 1 Indiana bat hibernaculum, which is defined as a cave that contains a population of 10,000 or more Indiana bats. *Id.*

Defendants focus on the area within five miles of the project site because Indiana bats ordinarily engage in fall swarming and spring staging within five miles of hibernacula, even though they may also engage in these activities at greater distances from the caves. Joint Pretrial Factual Stipulations ¶ 19. Lacki opined that Indiana bats will only go as far as necessary to forage for insects because flight is energetically expensive, and five miles is the typical normal limits of where most bats would forage. Trial Tr. 229:2-24, Oct. 23, 2009. The FWS generally places added emphasis on the five mile distance, *see, e.g.*, Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc., at 2 (Mar. 7, 2006) (Pls.' Ex. 97) ("Data indicate that the area within an approximate 5-mile radius of a hibernaculum is important foraging and roosting habitat for the Indiana bat at the time of spring emergence (staging) and prior to hibernation (swarming), although males have been found almost 10 miles from the hibernacula in Indiana." (internal citation omitted)), and BHE concentrated its cave study on those caves within five miles of turbine locations, BHE Envtl., Inc., Chiropteran Risk Assessment 23 (June 19, 2006) (Pls.' Ex. 126).

The fact that there are no caves within five miles of the project site known to currently contain Indiana bats makes it less likely that Indiana bats are present at the site

in large numbers during fall swarming and spring staging than if there were hibernacula within this area. However, the absence of hibernacula within five miles does not eliminate the possibility that Indiana bats are present at the site. For example, Indiana bats have been found more than five miles from hibernacula during fall swarming. *See, e.g.*, U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 41 (Apr. 2007) (Pls.' Ex. 52) (noting that Indiana bats have been found 9 miles and 19 miles from caves during fall swarming).

Moreover, the five mile distance has no bearing on the question of the presence of Indiana bats during *migration*. Trial Tr. 286:2-11, Oct. 23, 2009 (Lacki). Indiana bats have been observed to travel hundreds of miles from their hibernacula during migration. *See, e.g.*, U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 44 (Apr. 2007) (Pls.' Ex. 52). In fact, Robbins testified that he has captured Indiana bats at other wind project sites where the closest hibernaculum was approximately 100 miles away (a Priority 4 cave). Trial Tr. 205:25-206:8, Oct. 21, 2009. Robbins also opined that hibernacula within 150 miles of the Beech Ridge Project site, including Hellhole Cave (a Priority 1 cave), would be within the migratory range of Indiana bats. Trial Tr. 206:23-207:11, Oct. 21, 2009.

B. Physical Characteristics of the Beech Ridge Project Site

Plaintiffs assert, and Defendants disagree, that the physical characteristics of the Beech Ridge Project site are consistent with Indiana bat habitat.

First, the site contains snags with exfoliating bark, which Plaintiffs' experts opined are suitable roost sites for Indiana bat maternity colonies as well as male Indiana bats. *See, e.g.*, Robbins Rebuttal Decl. ¶ 4 (Pls.' Ex. 8); Kunz Rebuttal Decl. ¶ 5 (Pls.'

Ex. 5) (basing his assessment on photographs and field notes taken by Robbins and Gannon because he did not visit the project site); Gannon Rebuttal Decl. ¶ 14 (Pls.' Ex. 2). Plaintiffs' expert Robbins also testified that construction at the project site will kill "a lot of trees" that will not be removed, which will "start supplying a steady source of snags, at least for the near future." Trial Tr. 201:5-11, Oct. 21, 2009.

However, isolated snags are not sufficient to sustain maternity colonies because colonies disperse and regroup repeatedly over the course of the summer in a behavior called fission-fusion. Trial Tr. 243:7-18, Oct. 23, 2009 (Lacki); *see also* U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 46-47 (Apr. 2007) (Pls.' Ex. 52). Although Gannon testified that there were "a lot of potential roost sites," Trial Tr. 68:16-17, Oct. 21, 2009, and Robbins saw "quite a number of both larger and smaller snags," Trial Tr. 201:5-6, Oct. 21, 2009, no evidence was presented as to the number of suitable roost trees located at the project site. As a result, the Court finds that potential roost sites exist at the Beech Ridge Project site, but the Court cannot determine, based on the evidence on the record, whether these trees exist in sufficient number so as to sustain maternity colonies.

Second, construction at the Beech Ridge Project site has created new habitat that may attract Indiana bats. For example, the removal of vegetation has created forest edge habitat, increasing the amount of insects and thus the foraging area for Indiana bats. *See, e.g.*, Robbins Rebuttal Decl. ¶ 4 (Pls.' Ex. 8); Kunz Rebuttal Decl. ¶ 5 (Pls.' Ex. 5); Gannon Rebuttal Decl. ¶ 14 (Pls.' Ex. 2); Trial Tr. 47:7-21, Oct. 22, 2009 (Kunz) (testifying that construction has created habitat "sinks" where Indiana bats are likely to forage for insects); Trial Tr. 198:14-18, Oct. 21, 2009 (Robbins); Trial Tr. 70:23-71:3,

Oct. 21, 2009 (Gannon). In addition, the clearing of forest for the erection of transmission lines has created corridors, which Indiana bats may use when traveling. Robbins Rebuttal Decl. ¶ 4 (Pls.' Ex. 8); Kunz Rebuttal Decl. ¶ 5 (Pls.' Ex. 5); Gannon Rebuttal Decl. ¶ 14 (Pls.' Ex. 2); Trial Tr. 101:1-4, Oct. 21, 2009 (Gannon) (stating that "a corridor has been created there that could potentially funnel Indiana bats in one direction or the other"). Based on this evidence, the Court finds that construction has increased, rather than diminished, the likelihood that Indiana bats are present at the site.

Third, Defendants argued that the high elevation of the Beech Ridge Project, located at 3,600 to 4,300 feet above sea level, is not consistent with Indiana bat habitat. Lacki testified that at the project site, temperatures are lower and wind speeds higher, causing trees to lose their heat and making them less suitable roosting sites. Trial Tr. 246:25-247:8, Oct. 23, 2009; *see also* Trial Tr. 17:2-12, Oct. 29, 2009 (Tyrell). Also, Lacki opined that the higher wind speeds will increase mortality rates among younger Indiana bats, who are learning to fly and have not yet fully developed their echolocation capabilities, because the wind will make it more difficult for them to capture prey. Trial Tr. 247:11-248:3, Oct. 23, 2009. Both Stihler and Robbins agreed that they generally would not expect there to be maternity colonies at an elevation equal to that of the Beech Ridge Project. Stihler Dep. 110:20-111:6, Sept. 18, 2009 (Pls.' Ex. 131); Trial Tr. 230:14-18, Oct. 21, 2009 (Robbins). No maternity colonies have been observed in Greenbrier County, Trial Tr. 230:10-13, Oct. 21, 2009 (Robbins), but they have been found in West Virginia at approximately 2,700 feet, *id.* at Tr. 231:8-10 (Robbins), and 3,000 feet, Trial Tr. 80:1-7, Oct. 23, 2009 (Rommé). The Court finds that the high

elevation of the Beech Ridge Project site makes is less likely that Indiana bat *maternity colonies* are present.

C. Mist-Net Surveys

Putting aside serious questions raised about the adequacy of the techniques employed, BHE's failure to capture any Indiana bats during its July 2005 and June 2006 mist-net surveys would only support an argument that it is less likely that Indiana bats are present in large numbers at the Beech Ridge Project site *during the summer*. However, even if credited, the BHE mist-net survey results do not establish that Indiana bats are absent from the site at other times of the year. Mist nets often fail to capture bats, especially rare species like the Indiana bat. *See, e.g.*, Trial Tr. 161:1-4, Oct. 21, 2009 (Gannon); Trial Tr. 212:11-213:3, Oct. 21, 2009 (Robbins); U.S. Fish and Wildlife Serv. & Ky. Dep't of Fish and Wildlife Res., Indiana Bat Survey Guidance for Kentucky 9 (May 26, 2009) (Pls.' Ex. 55). In addition, the efficiency of the mist nets, and thus the accuracy of the survey results, may be reduced if the nets are not properly deployed.

In the pretrial briefs and at trial, Plaintiffs argued that BHE's surveys were inadequate.[37] They argued, for example, that the mist-net sites had poor canopy cover, that the surveys should not have been conducted on days on or around the full moon, and that additional surveys should have been conducted during the fall and spring. While these legitimate criticisms call into question the accuracy of the survey results, the adequacy or inadequacy of the preconstruction surveys is not on trial. Defendants do not

[37] Defendants made a continuing objection at trial as to evidence regarding the adequacy of the surveys on the grounds that it is irrelevant. Trial Tr. 73:1-3, Oct. 21, 2009. The Court overruled the objection. *Id.* at 73:4-5. The rigor of the surveys is relevant to determine the weight the Court must accord the survey results – results which suggest, if credited, that it is less likely that there are Indiana bats present at the Beech Ridge Project site. In addition, the adequacy of the surveys impacts Rommé's credibility, Defendants' fact and expert witness who was responsible for managing the chiropterean risk assessment at the Beech Ridge Project.

have the burden of proving that Indiana bats are absent from the site. Rather, as discussed in *supra* Part IX, Plaintiffs must establish by a preponderance of the evidence that the Beech Ridge Project is reasonably certain to imminently harm, kill, or wound Indiana bats, in violation of § 9 of the ESA.

D. Acoustic Data

AnaBat detectors can record the presence of bats that may not be caught in mist nets. The parties and their experts disagree whether individual bat species can be accurately identified from acoustic data and what analytical methods are best.[38] Acoustic detection and mist-netting are typically used in tandem: if acoustic data suggests that a particular species is present but the species has not been captured in mist nets, then additional mist-netting is necessary and appropriate. Gannon testified that every time he has detected the presence of Indiana bats using acoustic data and subsequently continued to deploy mist nets, he has captured an Indiana bat. Trial Tr. 86:16-23, Oct. 21, 2009 (Gannon).

The FWS field office in Kentucky, for example, currently requires the use of AnaBat detectors in conjunction with mist nets when conducting surveys for the presence of Indiana bats. *See* U.S. Fish and Wildlife Serv. & Ky. Dep't of Fish and Wildlife Res., Indiana Bat Survey Guidance for Kentucky 2-3, 9 (May 26, 2009) (Pls.' Ex. 55). Recent Indiana Bat Survey Guidance for Kentucky, which BHE consulted when analyzing the acoustic data in this case, Trial Tr. 95:13-96:7, Oct. 23, 2009 (Rommé), explains why both mist-netting and acoustic sampling is preferred:

[38] Although the debate largely centered on the software rather than hardware, Defendants' expert Lacki claimed that the AnaBat detector itself is a "very poor quality choice" to identify species and that the Pettersson detector is superior. Trial Tr. 252:12-253:4, Oct. 23, 2009.

> It is also well documented that Indiana bats, even when we know they are present, are difficult to capture using currently accepted mist netting survey techniques. . . . In one study (Robbins, 2001, unpublished data), acoustical detectors were more than twice as effective as mist nets in identifying Indiana bats using the study area. . . . [W]e have high confidence that the combination of mist netting and acoustical sampling will provide improved survey accuracy throughout Kentucky.

U.S. Fish and Wildlife Serv. & Ky. Dep't of Fish and Wildlife Res., Indiana Bat Survey Guidance for Kentucky 2-3 (May 26, 2009) (Pls.' Ex. 55); *see also id.* at 9 (same). The Kentucky FWS Field Office is testing the technology on a state-wide scale and believes that currently, Analook software for use with AnaBat systems "is the only acoustical sampling equipment capable of discerning among species of bats to an acceptable confidence level (Pers. Comm., Dr. Eric Britzke)." *Id.* at 9 (stating that if other methods are shown to discern species at an acceptable confidence level, they may be used if approved by the FWS); *see also* U.S. Fish and Wildlife Serv., U.S. Fish and Wildlife Serv., Range-wide Indiana Bat Protection and Enhancement Plan Guidelines 24 (July 2009) (Pls.' Ex. 54) (same).

The Kentucky protocol uses two software filters. The first filter removes background noise. U.S. Fish and Wildlife Serv. & Ky. Dep't of Fish and Wildlife Res., Indiana Bat Survey Guidance for Kentucky 9 (May 26, 2009) (Pls.' Ex. 55). The second filter, commonly called the Britzke filter (after Dr. Eric Britzke, a former student of Robbins) or the Kentucky Indiana bat filter, identifies Indiana bat calls. *Id.* The Kentucky protocol requires that if Indiana bat calls are detected on the acoustic data, then additional mist-netting is required. *Id.* at 11, App. 5-6.

During the course of this litigation, BHE used the Britzke filter to analyze the acoustic data collected at the Beech Ridge Project site. Trial Tr. 96:4-13, Oct. 23, 2009

(Rommé); *id.* at 164:12-16 (Rommé) (explaining that Lisa Winhold, a biologist at BHE, analyzed the data). BHE concluded that no Indiana bat calls had been recorded. Trial Tr. 96:4-11, Oct. 23, 2009 (Rommé).

Robbins, a leading expert in the field of acoustic analysis of bat calls, testified that the filter developed by his former student, Britzke, is "basically a filter for dummies." Trial Tr. 182:11-14, Oct. 21, 2009. Robbins explained that the Britzke filter is a very conservative filter because it makes a positive match only if five individual pulses in a sequence have the "ideal characteristics" of an Indiana bat call.[39] *Id.* at 182:21-24. In fact, when Robbins ran the Britzke filter against a library of known Indiana bat calls, it identified only 27% of them as Indiana bats. *Id.* 183:9-14; *see also id.* at 184:2-5 (explaining that the Britzke filter produced false negatives 73% of the time); Lynn Robbins, Chart of Kentucky MYSO [Indiana bat] Filter on Known Calls (Pls.' Ex. 124, Bates No. P-4729) (demonstrating that when Robbins reduced the number of required pulses from five to one, the Britzke filter correctly identified only 74% of the known Indiana bat calls). Because it is so conservative, Robbins testified that he "would not rely on the Britzke filter to tell me that the bats were not present." Trial Tr. 184:22-23, Oct. 21, 2009.

Robbins also ran the Britzke filter against the Beech Ridge Project data and it found no Indiana bat calls. *Id.* at 183:1-3. He then reduced the number of pulses needed

[39] Robbins testified that "[t]he problem with the [Britzke] filter is those parameters were developed by Britzke based on a mean and a standard error around the mean of each parameter in one of those pulses. And the problem is, as I mentioned, 40 percent of the variability or more is within one sequence, and so it's only including a very small part of the variation that's within a good Indiana bat call sequence." Trial Tr. 185:21-186:2, Oct. 21, 2009.

from five to four, and the Britzke filter identified two Indiana bat calls.[40] *Id.* at 183:4-8 (stating that he also ran the Britzke filter with three pulses).

Plaintiffs' experts Robbins and Gannon also independently analyzed, using different techniques, the two nights of acoustic data collected by Libby at the Beech Ridge Project site.[41] *They both identified Indiana bat calls.* Defendants assert that the technology is unproven and unreliable, and criticize the methodologies used by Robbins and Gannon.

Robbins performed a three-step process to identify the different bat species recorded using AnaBat at the Beech Ridge Project site. First, Robbins used a filter to reduce noise, which is information that does not represent bat calls. Trial Tr. 161:8-23, Oct. 21, 2009 (Robbins). Second, he ran a computer program, using discriminant-function analysis, that he developed with Britzke. *Id.* at 161:19-23 (Robbins). The program takes the unknown sequence and compares each pulse in the sequence to a library of known bat calls which Robbins collected over a five to six year period. *Id.* at

[40] Robbins did not use the Britzke filter in order to determine whether Indiana bats are present at the Beech Ridge Project site. Rather, he used it to respond to BHE's belated analysis of the acoustic data using this technique. The purpose of Robbins' testimony was to explain the limitations of the Britzke filter. Robbins also analyzed the acoustic data with a computer program that he developed, using discriminant-function analysis.

[41] Robbins testified that among the files that he received from Lisa Winhold, the BHE employee that used the Britzke filter to analyze the acoustic data collected at the Beech Ridge Project site, there was a folder labeled *Myotis*, which contained 25 to 30 bat call sequences. Trial Tr. 191:11-17, Oct. 21, 2009; *see also* CD-ROM: AnaBat Files (July 24 & 26, 2005) (Pls.' Ex. 123) (containing a folder labeled *Myotis* in file path "20050724 analyzed by LMW\FCALLS\MYOTIS," where "LMW" presumably is Lisa M. Winhold). Robbins noticed the folder after he had already "looked at the whole two days of files." *Id.* at 191:11-16. Robbins eventually analyzed the files in the folder labeled *Myotis* and identified six Indiana bat calls. *Id.* at 192:17-19. He sent the files to Britzke, and Britzke confirmed that there were six Indiana bat calls. *Id.* at 192:13-15 (Robbins); *see id.* at 191:17-19 (Robbins) ("And so I said, well if somebody in their group [i.e., BHE] identifies *Myotis*, let's see if Eric [Britzke] can identify these."). Robbins testified that he did not know what methodology Britzke used to analyze these files. *Id.* at 192:22-24. Brooke Slack, former biologist at BHE and current bat biologist at the Kentucky Department of Fish and Wildlife Resources, testified that Brizke told her that he "qualitatively looked at them" and did not "run them through a Discriminate Function Analysis or against a filter." Trial Tr. 183:10-184:19, Oct. 23, 2009. Because Britzke did not testify or explain how he conducted his analysis, the Court accords little weight to his results.

162:1-12 (Robbins); *id.* at 178:1-17 (Robbins). The program looks at ten different parameters, of which frequency, time, and slope are some of the most critical, *id.* at 169:7-20 (Robbins), and returns a possible species identification for each pulse, *id.* at 178:1-4. If 75% or more of the pulses in any given sequence are identified as a particular species, then Robbins deems there to be a positive match. *Id.* at 178:5-12 (Robbins) (explaining that he also conducts a visual examination for any sequence identified as *Myotis*). Third, Robbins ran another computer program that produces a probability value (a "P" value) that there are ***no*** Indiana bats in the total data set based on the distribution of the bat species identified in the data set. *Id.* at 164:9-165:11 (Robbins). The methodology used by Robbins has been peer reviewed and published. *See* Eric R. Britzke et al., *Acoustic Identification*, *in* The Indiana Bat, Biology and Management of an Endangered Species 221 (A. Kurta & J. Kennedy ed., 2002) (Pls.' Ex. 51).

Robbins identified six sequences recorded on July 24, 2005 and two recorded on July 26, 2005 as being likely Indiana bat calls. Trial Tr. 179:1-3, Oct. 21, 2009 (Robbins). None of these sequences had fewer than ten pulses. *Id.* 186:4-12 (Robbins); *see also id.* at 172:10-14 (Robbins) (explaining that sequences with fewer pulses could yield false results). The "P" value for the entire data set (i.e., for both days together) is 0.024, which means that there is a statistically significant probability of only 2.4% that Indiana bats are ***not*** in the data set.[42] *Id.* 179:8-180:21 (Robbins); *see also* Lynn Robbins, Report Calculating "P" Values of Beech Ridge Project Acoustic Data (Pls.' Ex. 124, Bates No.

[42] The "P" value for the July 24, 2005 data set is 0.033, which is statistically significant. Trial Tr. 194:4-20, Oct. 21, 2009 (Robbins); Lynn Robbins, Report Calculating "P" Values of Beech Ridge Project Acoustic Data, at 1 (Pls.' Ex. 124, Bates No. P-4726). However, the "P" value for the July 26, 2005 data set is 0.402, which suggests that the results for that day are unreliable. Trial Tr. 195:4-17, Oct. 21, 2009 (Robbins); Lynn Robbins, Report Calculating "P" Values of Beech Ridge Project Acoustic Data (Pls.' Ex. 124, Bates No. P-4727).

P-4728). Accordingly, Robbins testified that it is "statistically highly probable that [Indiana bats] were present in significant numbers." Trial Tr. 197:2-3, Oct. 21, 2009.

Defendants' expert Lacki, who is not an expert in acoustic analysis, criticized Robbins for concluding that a call sequence is an Indiana bat when only three pulses in that sequence are a match. Trial Tr. 256:4-17, Oct. 23, 2009; *see also id.* at 260:1-4 ("[Robbins] willingly admitted [during his testimony at trial] that he felt that three good pulses was a better approach in terms of identifying Indiana bat than using a fuller set of information."). Lacki opined that because Robbins' model used fewer data points, it is unstable and can yield false positives. *Id.* at 256:17-257:8; *see also id.* at 260:4-5 (alleging that Robbins' analysis violated the use of the discriminant-function analysis). Furthermore, Lacki alleged that the approach was inconsistent with Robbins' own published paper describing the technique, because where other *Myotis* species are present, like at the Beech Ridge Project site, more data is required to accurately identify Indiana bats. Lacki Second Supplemental Decl. ¶ 4 (Defs.' Ex. 3); Trial Tr. 259:4-18, Oct. 23, 2009. In addition, Lacki critiqued the call library used by Robbins because it contains Indiana bat calls collected in states other than West Virginia. Lacki Second Supplemental Decl. ¶ 4 (Defs.' Ex. 3).

In response to Lacki's critique, Robbins testified that "I think he misunderstood the idea of the five pulses." Trial Tr. 186:17-21, Oct. 21, 2009. Robbins observed that the paper that he co-authored with Britzke is silent as to the number of pulses necessary to yield accurate results. *Id.*; *see also generally* Eric R. Britzke et al., *Acoustic Identification, in* The Indiana Bat, Biology and Management of an Endangered Species 221 (A. Kurta & J. Kennedy ed., 2002) (Pls.' Ex. 51). With regard to Lacki's criticism of

the call library, Robbins and Gannon both opined that there are no significant differences between Indiana bat calls from different parts of the country. Trial Tr. 162:13-163:20 (Robbins); *id.* at 97:12-98:1 (Gannon). Robbins testified, and the Court agrees, that his analysis of the Beech Ridge Project data is sound science and that his results are reliable and repeatable. *Id.* at 188:9-13.

It is unclear from the record how many matched pulses Robbins required to conclude that a call sequence was from an Indiana bat. Despite Lacki's statements to the contrary, Robbins did not testify at trial that he used only three pulses when conducting his discriminant-function analysis. Rather, Robbins testified that he used three pulses when running the *Britzke filter* against the Beech Ridge Project data to demonstrate that the Britzke filter is conservative, *id.* at 183:4-8, and he explained that sometimes he will "play with [the Britzke filter] on a five, four, three pulses to target areas or target sequences that we want to look at later," *id.* at 184:17-19. *See also* Lynn Robbins, Chart of Kentucky MYSO [Indiana bat] Filter on Known Calls (Pls.' Ex. 124, Bates No. P-4729) (indicating that Robbins ran the Britzke filter with five, four, three, two, and one pulses on the library of known Indiana bat calls to test the accuracy of the technique). In fact, Robbins' testimony appears to suggest that all of the call sequences that he identified as being from Indiana bats when he ran the discriminant-function analysis had a minimum of eight matched pulses. *See* Trial Tr. 186:4-7, Oct. 21, 2009 (stating that none of the call sequences that he identified as Indiana bat had fewer than ten total pulses); *id.* at 178:5-12 (explaining that he identified a call sequence as from a particular species only if 75% or more of the pulses in that sequence were a match).

To the extent that Lacki is suggesting that use of the Britzke filter with less than five pulses produces unreliable results, the Court agrees. However, in all other respects, Lacki's criticism of Robbins' technique appears to be without any basis and outside of the area of his expertise. Moreover, as a general matter, the Court finds Robbins, a leading expert in the field, more credible than Lacki, who conceded that he is not an expert on acoustic analysis and who did not independently analyze the Beech Ridge Project acoustic data. Trial Tr. 271:14-19, Oct. 23, 2009 (Lacki). The Court therefore gives significant weight to Robbins' analysis and results.

Plaintiffs' expert Gannon used a technique similar to the process employed by Robbins to analyze the Beech Ridge Project acoustic data. Gannon isolated 42 sequences out of approximately 160 recorded at the site as having a sufficient number of pulses to be identifiable. Trial Tr. 93:5-9, Oct. 21, 2009 (Gannon); *id.* at 137:16-19 (Gannon). He then ran a computer program to compare the 42 identifiable sequences to a library of 4,000 known calls, 300 to 400 of which are Indiana bat calls. *Id.* at 89:5-10 (Gannon); *see also id.* at 89:23-24 (Gannon) (explaining that it took him six years to assemble the library); *id.* at 97:5-11 (Gannon) (stating that the Indiana bat calls in his library were collected in West Virginia, Virginia, and Pennsylvania). Gannon's computer program determines that there is a positive match if a call is at least 85% similar to the "range" of Indiana bat calls in the library. *Id.* at 91:12-24 (Gannon).

To determine the accuracy of his approach generally, Gannon conducted double-blind testing on a set of 20 known Indiana bat calls. *Id.* at 90:12-91:24 (Gannon). Because the program correctly identified 18 of the 20 known Indiana bat calls, and did not match the other two calls to any species, Gannon concluded that his methodology has

a 90% success rate, with the remaining 10% being false negatives. *Id.* at 90:22-91:24 (Gannon); *id.* at 93:10-19 (Gannon). Gannon testified that there are peer-reviewed publications that use his technique, but that he did not know whether the program itself has been peer reviewed. *Id.* at 130:19-23 (Gannon). Gannon has used this approach on a project involving the U.S. Forest Service. *Id.* at 89:25-90:13 (Gannon); *id.* at 92:3-93:2 (Gannon).

Of the 42 identifiable bat call sequences, Gannon identified three as Indiana bats. *Id.* at 93:5-9 (Gannon). Gannon testified that "of the three calls . . . one was an 87-; one was a 92-; and one was a 94 percent probability match, but they all met the minimum 85 percent." *Id.* at 129:2-6 (Gannon). *But see id.* at 96:10 (stating that it is not a "statistical test").

Defendants' expert Lacki argued that Gannon's technique uses incomplete call sequences and is therefore less rigorous and likely to produce false positives. Lacki Second Supplemental Decl. ¶ 5 (Defs.' Ex. 3). He also opined that a "probability cutoff of 85%" is not acceptable. *Id.* Gannon responded that the 85% similarity threshold that he used is not a "statistical test," Trial Tr. 96:10, Oct. 21, 2009, explaining that it cannot be equated to the "95% significance [level] which is accepted in science for a statistical test," *id.* at 96:21-97:1.

Although the Court does have some reservations regarding the double-blind testing that Gannon used to determine the probability that his methodology is generally accurate (which is different from the 85% similarity threshold that Lacki criticized), the

Court nonetheless gives significant weight to Gannon's analysis and testimony.[43] Unlike Lacki, Gannon is an expert in acoustic analysis,[44] he confirmed that his approach is "sound science," Trial Tr. 92:18-93:2, Oct. 21, 2009, and the U.S. Forest Service agreed to use the technique in a project for which it had hired Gannon.

E. Indiana Bats are Present at the Beech Ridge Project Site

Considering all of the evidence in the record, the Court concludes by a preponderance of the evidence that there is a virtual certainty that Indiana bats are present at the Beech Ridge Project site during the spring, summer, and fall. (Indiana bats are not likely to be present during winter, when the bats are hibernating.)

First, the Court finds that the close proximity of Indiana bat hibernacula to the project site, one cave located at 6.7 miles and another at 9.6 miles from the nearest turbines, supports a conclusion that Indiana bats are likely present at the Beech Ridge Project site. Indiana bats have been observed to travel far in excess of these distances in the spring, summer, and fall.[45]

Second, the Court finds that the physical characteristics of the site also make the presence of Indiana bats more likely. The project site contains suitable roosting snags, and construction has further augmented the environment by creating habitat "sinks" that attract Indiana bats. Although the high elevation of the site makes it less likely, but not

[43] The Court gives more weight to Robbins' analysis than Gannon's analysis, especially since Gannon testified that "I would, at this point, have more faith in what [Robbins is] doing than my own, because he's been continuously developing this over the past few years . . . ." Trial Tr. 94:17-21, Oct. 21, 2009.

[44] Even Rommé, Defendants' fact and expert witness, hired Gannon a decade ago because of his expertise in AnaBat technology. Trial Tr. 148:18-149:10, Oct. 23, 2009 (Rommé).

[45] The fact that there are no Indiana bat hibernacula within five miles of the project site somewhat reduces the likelihood that Indiana bats are present, but this must not be considered in isolation, but rather in the context of migration and other evidence in the record, including analysis of the acoustic data.

impossible, that maternity colonies are present during the summer, Indiana bats may still use the site during migration, fall swarming, and spring staging.

Third, the Court concludes that the acoustic data, collected by an entrepreneurial BHE subcontractor, confirms to a virtual certainty the presence of Indiana bats.[46] Both Robbins and Gannon presented compelling testimony that their analysis of the AnaBat data identified Indiana bat calls. *See* Robbins Rebuttal Decl. ¶ 10 (Pls.' Ex. 8) ("[T]he only logical scientific conclusion based on the foregoing is that Indiana bats are very likely – if not certainly – present based on the Beech Ridge [P]roject site during spring, summer, and fall . . . ."); Trial Tr. 199:4-5, Oct. 21, 2009 (Robbins) (stating that the results of his analysis of the acoustic data "absolutely verify the fact that Indiana bats are using the area"); *Id.* at 109:25-110:26 (Gannon) ("[T]he fact that we have now the AnaBat data shows that there are Indiana bats on the site."); *see also* Kunz Rebuttal Decl. ¶ 8 (Pls.' Ex. 5) (stating, without having analyzed the acoustic data, that "there is a high likelihood of Indiana bat use of the Beech Ridge project during spring, summer, and especially fall"). Because only four hours of acoustic data was collected over a mere two night period – during one summer survey session when Indiana bats are least likely to be present – more extensive acoustic surveys during different seasons and at different locations at the project site would almost certainly yield a greater number of Indiana bat calls.

Based on the evidence of nearby hibernacula, the physical characteristics of the project site, the acoustic data, and the behavioral traits of Indiana bats, the Court

[46] Again, BHE's failure to capture Indiana bats during the two summer mist net surveys does not suggest that Indiana bats are absent because (i) mist nets often fail to capture rare species; (ii) BHE only conducted surveys during the summer; and (iii) the evidence indicates that BHE may not have properly deployed the mist nets.

concludes by a preponderance of the evidence that Indiana bats are present at the Beech Ridge Project site during the spring, summer, and fall.

XII. Likelihood of a Take of Indiana Bats at the Beech Ridge Project Site

It is uncontroverted that wind turbines kill bats, and do so in large numbers. Defendants contend, however, that Indiana bats somehow will escape the fate of thousands of their less endangered peers at the Beech Ridge Project site.

Defendants argue that Indiana bats do not fly at the height of the turbine blades. Lacki and Tyrell stated that Indiana bats are "edge foragers," meaning they tend to forage for food directly below or at the tree canopy. Trial Tr. 224:21-225:3, Oct. 23, 2009 (Lacki); Trial Tr. 19:22-20:9, Oct. 29, 2009 (Tyrell); *see also* U.S. Fish and Wildlife Serv., Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision 50 (Apr. 2007) (Pls.' Ex. 52) ("Indiana bats usually forage and fly within an air space from 2 to 30 m (6 to 100 ft) above ground level (Humphrey et al. 1977)."). Lacki opined that Indiana bats are not going to be in locations, such as the area above the tree canopy, where "their foraging approach is likely to render them vulnerable." Trial Tr. 225:8-13, Oct. 23, 2009. Tyrell speculated that the tree canopy at the Beech Ridge Project site is 60 to 80 feet above the ground, Trial Tr. 20:1-20:4, Oct. 29, 2009, which is below the lowest part of the rotor swept area.

However, Plaintiffs' expert Kunz, one of the leading bat biologists in the country, stated that with the development of acoustic technology and thermal cameras, there is growing research that bats can fly as high as a kilometer or more above the ground, and that Indiana bats may also fly at these altitudes. Trial Tr. 49:1-18, Oct. 22, 2009. Kunz explained that bats fly above the tree canopy as warm air carries insects high above the surface of the earth. *Id.* at 50:1-19 (stating that insects can be carried as high as 2.5 km

above the ground). Kunz opined that "the fact that Indiana bats were detected at ground level . . . suggests that they would also would also equally likel[y] be detected higher up in the rotor swept region." Trial Tr. 77:10-14, Oct. 22, 2009. Moreover, the height at which Indiana bats forage has no relation to how high they fly during migration. *See, e.g.*, Trial Tr. 84:11-17, Oct. 29, 2009 (Tyrell).

Defendants also point out that no Indiana bat has been confirmed dead at any wind power project in the country,[47] which they contend supports a conclusion that Indiana bats, unlike other bat species, are somehow able to avoid harm caused by wind turbines.

However, other *Myotis* species have been reported killed at wind power projects. *See, e.g.*, Edward B. Arnett et al., *Patterns of Bat Fatalities at Wind Energy Facilities in North America*, 72 J. of Wildlife Mgmt. 61, 64 (2008) (Pls.' Ex. 31); BHE Envtl., Inc., Chiropteran Risk Assessment 29 (June 19, 2006) (Pls.' Ex. 126) (listing bat species detected in mortality searches at the Mountaineer and Meyersdale wind energy facilities). Plaintiffs' experts opined that biologically, Indiana bats are no less vulnerable than other *Myotis* species to turbine collisions and barotrauma.[48] Trial Tr. 209:7-8, Oct. 21, 2009

[47] At the Mountaineer wind energy project, a wildlife incident reporting form ("Mountaineer Incident Report") identified a dead bat as a possible Indiana bat or Gray bat and attached a photograph of the bat. Mountaineer Incident Report (Pls.' Ex. 37). Because of the close proximity of Mountaineer to the Beech Ridge Project, Plaintiffs cite the Mountaineer Incident Report in support of their argument that Indiana bats are likely to be killed at the Beech Ridge Project site. Plaintiffs' experts, Gannon and Robbins, testified that they could not conclusively identify the bat from the photograph attached to the Mountaineer Incident Report. Trial Tr. 106:8-108:25, Oct. 21, 2009 (Gannon); Trial Tr. 110:23-111:13 (Gannon); Trial Tr. 219:4-17 (Robbins). Defendants' experts provided similar testimony, *see, e.g.*, Lacki Decl. ¶ 7 (Defs.' Ex. 3), and Tyrell testified that the Mountaineer photograph did not look like an Indiana bat, Trial Tr. 25:19-27:16, Oct. 29, 2009. Accordingly, to the extent that it considers the Mountaineer Incident Report, the Court accords very little weight to this evidence.

[48] Gannon stated that the FWS in Pennsylvania is using the ratio of little brown bats to Indiana bats to predict the number of Indiana bats that will be killed by wind turbines. Trial Tr. 57:17-58:12, Oct. 21, 2009; *see also id.* at 59:11-19 (Gannon) ("Obviously, we would like to know more about the bats and be able to have a better predictor. But, I think that given that there is nothing inherently different about an

(Robbins) ("I can think of no other behavioral difference [that would preclude the Indiana bat from being killed similar to other *Myotis* species] other than that they are harder to catch."); Trial Tr. 56:6-12, Oct. 22, 2009 (Kunz) ("[O]ther species of *Myotis* with similar characteristics . . . have been killed by wind turbines, and particularly large numbers at other eastern wind facilities such as the Mountaineer facility in West Virginia."); Trial Tr. 62:9-10, Oct. 21, 2009 (Gannon) ("I believe they're just as susceptible as any of the other species that have been killed."); *see also* Stihler Dep. 74:14-19 (Pls.' Ex. 131) ("When we look at Mountaineer, I think every species of bat except the three rarest ones in the country were found at the wind turbine. And there's no biological reason why those three would not have often been up at the site and impacted similarly.").

In addition, post-construction mortality studies are generally inefficient (for example, due to scavenging), thus making the chances of finding the carcass of a rare species even smaller. Trial Tr. 58:13-59:10, Oct. 21, 2009 (Gannon) (30% efficiency); *Id.* at 237:25-238:9 (Robbins) ("[T]he ability to find dead bats is somewhere less than 50%."); Trial Tr. 28:1-8, Oct. 22, 2009 (Kunz) (28% - 75% efficiency); *see also* Edward B. Arnett et al., *Patterns of Bat Fatalities at Wind Energy Facilities in North America*, 72 J. of Wildlife Mgmt. 61, 62, 71 (2008) (Pls.' Ex. 31). At trial, Gannon criticized those mortality studies – like those proposed at the Beech Ridge Project site, Trial Tr. 60:24-61:14, Oct. 23, 2009 (Groberg) – that survey only a subset of the turbines: "[i]f you've got a haystack, and you're only looking at a very small portion of that haystack, what's the odds that you're going to find something rare in the haystack?" Trial Tr. 64:5-65:1, Oct. 21, 2009.

Indiana bat and a little brown bat as far as their ability to be killed by these wind turbines, I would say that's probably a good predictor at this point.").

Plaintiffs' experts opined as follows regarding the likelihood that Indiana bats will be harmed by the Beech Ridge Project:

- Robbins: "Because the only logical scientific conclusion based on the foregoing is that Indiana bats are very likely – if not certainly – present on the Beech Ridge project site during spring, summer, and fall, it is still my opinion that there is a high likelihood that Indiana bats will be killed and injured by this project." Robbins Rebuttal Decl. ¶ 10 (Pls.' Ex. 8).
- Gannon: "Since, in my opinion, there exists an extremely high likelihood of Indiana bat presence on the project site during spring, summer, and fall based on the current evidence, my position remains that Indiana bats are very likely to be killed and injured by the [Beech Ridge Project]." Gannon Rebuttal Decl. ¶ 17 (Pls.' Ex. 2).
- Kunz: "Because Indiana bats are very likely to be present on the Beech Ridge project site during three seasons of each year when turbines operate, it continues to be my opinion that there is a high likelihood that Indiana bats will be killed and/or injured by this project during its twenty-year lifespan." Kunz Rebuttal Decl. ¶ 9 (Pls.' Ex. 5); *see also* Trial Tr. 48:10-22, Oct. 22, 2009 (stating that after learning about the AnaBat data and the higher mortality estimate, he is even more confident that Indiana bats will be harmed).

The Court agrees with these very credible expert opinions. The Court finds that there is no reason why Indiana bats would not fly at a height of 137 to 389 feet above the ground, within the rotor swept area of the turbines at the Beech Ridge Project site.

Plaintiffs have presented compelling evidence that Indiana bats behave no differently than other *Myotis* species that have been killed by wind turbines and Defendants have failed to rebut this fact. Furthermore, the Court is not surprised that no dead Indiana bat has yet been found at any wind project because few post-mortality studies have been conducted, mortality searches are generally inefficient, and Indiana bats are rare.

Based on the evidence in the record, the Court therefore concludes, by a preponderance of the evidence, that, like death and taxes,[49] there is a virtual certainty that Indiana bats will be harmed, wounded, or killed imminently by the Beech Ridge Project, in violation of § 9 of the ESA, during the spring, summer, and fall.

XIII. Effectiveness of Discretionary Post-Construction Adaptive Management Techniques

Defendants point to adaptive management after completion of construction as the appropriate way to address any perceived threat to Indiana bats. Even if adaptive management is ultimately the best way to reduce the risk of death and injury to Indiana bats posed by the Beech Ridge Project, Defendants are not currently *required* to implement *any* minimization or mitigation techniques. The West Virginia Public Service Commission's August 28, 2006 Order contains only precatory language.

Specifically, the Order states only that Defendants must "*consult*" with the TAC regarding the "*potential* for adaptive management" and agree to "*test* adaptive management strategies." Beech Ridge Energy LLC, No. 05-1590-E-CS, 2006 W. Va. PUC LEXIS 2624, at *184-86 (W. Va. Pub. Serv. Comm'n Aug. 28, 2006) (emphasis added). Only if (i) the project causes "significant levels of bat or bird mortality" –

[49] Letter from Benjamin Franklin to Jean Baptiste Le Roy (Nov. 13, 1789), *reprinted in* The Writings of Benjamin Franklin 1789-1790, at 69 (Albert Smyth ed., The Macmillan Co. 1907).

numbers which are not defined; and (ii) adaptive management techniques are "proven effective" – *a level of effectiveness which is not established*; and (iii) adaptive management techniques are "economically feasible*" – the feasibility of which will be determined by the project developers* – must Beech Ridge Energy make a "*good faith effort* to work with the Commission" to implement adaptive management strategies. *Id.* at *185 (emphasis added). The Order states that adaptive management is discretionary and it imposes no consequences on Defendants if they fail to adopt necessary minimization and mitigation strategies.

Moreover, because Defendants repeatedly ignored letters from the FWS recommending additional preconstruction surveys and surveying techniques, the Court has little confidence that Defendants will actually implement any adaptive management strategies recommended by the TAC. At trial, Groberg, Vice President of Business Development for Invenergy and the lead developer of the Beech Ridge Project, testified that "I didn't want to commit to implementing anything that I couldn't put some bounds on." Trial Tr. 55:14-21, Oct. 23, 2009. Defendants will likely continue to exhibit similar restraint.[50]

In addition, the Court is highly skeptical of Defendants' ability and desire, without proper oversight, to identify Indiana bats during the course of ordinary business while the turbines are operating. Mortality studies are typically inefficient and are not comprehensive. *See supra* Part XII. Furthermore, the limited scope of the pre-construction surveys suggests that any post-construction monitoring will be ineffective. Rommé ignored repeated formal letters from the Service recommending that BHE

[50] Even Defendants' expert Lacki testified that giving a wind energy company discretion to implement or disregard adaptive management recommendations is unacceptable. Trial Tr. 267:10-268:9, Oct. 23, 2009.

perform three years of pre-construction surveys, conduct surveys during fall swarming and spring staging, and use other survey methods, including acoustic detection.[51] In addition, BHE neither provided the acoustic data to any of the regulators nor analyzed it using either technology available at the time, if any, or improved technology as it has become available. It was not until this litigation began that BHE attempted to analyze the acoustic data. BHE's actions in this case and on behalf of other clients[52] give the Court little reason to have any confidence in the effectiveness of any proposed post-construction monitoring advocated by Defendants.

Because entirely discretionary adaptive management will not eliminate the risk to Indiana bats, the Court has no choice but to award injunctive relief.

---

[51] Groberg testified that "every letter we've ever gotten says to do three years of studies, avian studies. We have not done that. That is typical for the industry, though. You know, the – regardless of the avian risk at a site, or the other risks at a site, you always get that recommendation." Trial Tr. 158:5-7, Oct. 21, 2009.

[52] Gannon worked with BHE and Rommé in 1999 on a project involving Interstate-99 in central Pennsylvania. Gannon Rebuttal Decl. ¶ 21 (Pls.' Ex. 2). In his rebuttal declaration, Gannon states that he withdrew from the project because "BHE Environmental's motives and methodologies were in my opinion highly questionable and contrary to the independent scientific analysis that was needed to determine presence of probable absence of Indiana bats on the I-99 site." *Id.* Gannon further explains that:

> Against my recommendations, Russ Romm[é] selected acoustic survey locations that were not conducive for detecting Indiana bats, while other much more suitable locations existed on the site were not surveyed. Further, Russ Romm[é] refused to allow me to conduct any mist netting at certain acoustic detection sites, even though I offered to set those nets at no additional cost to BHE or its client. Moreover, and in stark contrast to any other project I have worked on with a consulting firm, Russ Romm[é] attempted to restrict my communication with the state and federal wildlife agencies regarding his selected placement of acoustic detectors to detect Indiana bat presence – an open dialogue that, in my opinion is necessary to inform the agencies of all developments that occur during the survey period in order to address any issues of concern in a timely fashion, including any captures of endangered Indiana bats. Because of the ethical concerns I had with BHE's work, I withdrew from the project – a decision that resulted in a loss of an $80,000 contract for Penn State University (my employer), and a personal loss of approximately $16,000 of summer salary."

Id. *See also* E-mail from Michael Gannon, Professor, Pennsylvania State University, to Russ Rommé, BHE Envtl., Inc. (June 29, 1999, 6:54 PM) (Pls.' Ex. 127) ("[A]s long as your office wishes to regulate communications between myself and USF&W or anyone else as a condition for funding this research, I must decline your offer to participate further and must withdraw my proposal from consideration.").

XIV. Injunctive Relief

Because the Court has found that the Beech Ridge Project will take Indiana bats, injunctive relief is appropriate under § 11 of the ESA. The question, then, is what form that injunctive relief should take. The ITP process is available to Defendants to insulate themselves from liability under the ESA and, while this Court cannot require them to apply for or obtain such a permit, it is the only way in which the Court will allow the Beech Ridge Project to continue.

The Court sees little need to preclude the completion of construction of those forty turbines already under construction, but does believe that any construction of additional turbines should not be commenced unless and until an ITP has been obtained. The simple reason for this is that the ITP process may find that some locations for wind turbines are entirely inappropriate, while others may be appropriate.

There is, by the same token, no reason to completely prohibit Defendants from operating wind turbines now under construction once they are completed. However, in light of the record developed before this Court, that operation can only occur during the periods of time when Indiana bats are in hibernation, i.e., from November 16 to March 31. *See* Joint Pretrial Factual Stipulations ¶¶ 13, 20; Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc., at 2 (Mar. 7, 2006) (Pls.' Ex. 97). Outside this period, determining the timing and circumstances under which wind turbine operation can occur without danger of the take of an Indiana bat is beyond the competence of this Court, but is well within the competence of the FWS under the ITP process.

Accordingly, the Court will enjoin all operation of wind turbines presently under construction except during the winter period enumerated above. However, the Court invites the parties to confer with each other and return to the Court, if agreement can be reached, on the conditions under which the wind turbines now under construction would be allowed to operate, if at all, during any period of time outside of the hibernation period of Indiana bats.

XV. Conclusion

As noted at the outset, this is a case about bats, wind turbines, and two federal policies, one favoring the protection of endangered species, and the other encouraging development of renewable energy resources. Congress, in enacting the ESA, has unequivocally stated that endangered species must be afforded the highest priority, and the FWS long ago designated the Indiana bat as an endangered species. By the same token, Congress has strongly encouraged the development of clean, renewable energy, including wind energy.[53] It is uncontroverted that wind turbines kill or injure bats in large numbers, and the Court has concluded, in this case, that there is a virtual certainty that construction and operation of the Beech Ridge Project will take endangered Indiana bats in violation of Section 9 of the ESA.

The two vital federal policies at issue in this case are not necessarily in conflict. Indeed, the tragedy of this case is that Defendants disregarded not only repeated advice from the FWS but also failed to take advantage of a specific mechanism, the ITP process,

[53] *See, e.g.*, Wind Energy Research and Development Act of 2009, H.R. 3165, 111th Cong. (2009) ("To provide for a program of wind energy research, development, and demonstration, and for other purposes."); Press Release, U.S. Dep't of Energy, Secretary Chu Announces $93 Million from Recovery Act to Support Wind Energy Projects (Apr. 29, 2009); President Barack Obama, Remarks at Trinity Structural Towers Manufacturing Plant, Newton, Iowa (Apr. 22, 2009) (announcing that "[m]y budget also invests $15 billion each year for 10 years to develop clean energy"); U.S. Dep't of Energy, 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply (July 2008).

established by federal law to allow their project to proceed in harmony with the goal of avoidance of harm to endangered species

Sadly, Defendants' environmental consultant, Russ Rommé, viewed formal communications from the FWS through rose-colored glasses and simply disregarded what he was told repeatedly. Indeed, the Court finds Rommé's testimony to be extremely troubling. If the Court were to accept his testimony, it would have to reach one or both of two equally untenable conclusions.

First, Rommé's description of his communications with Johnson-Hughes is that she effectively countermanded important advice given to BHE by her supervisor, Chapman. The Court rejects Rommé's myopic view of the communications that he received from the FWS. Johnson-Hughes did not testify, and there were no written communications from her stating that Rommé could disregard vital portions of the letters received from Chapman. Indeed, in one of Rommé's numerous "contact reports" he documented a conversation with Johnson-Hughes on April 6, 2006, in which he acknowledged that the FWS had "focused on the critical nature of early screening of potential wind development sites." BHE Contact Report, Telephone Call Between Russ Rommé, BHE Envtl., Inc, and Christy Johnson-Hughes, U.S. Fish and Wildlife Serv. (Apr. 6, 2006) (Defs.' Ex. 82). And, in a tragically prophetic comment, he attributed to the FWS a statement that "[t]here are indications wind developers are still not doing this work, and getting themselves [into] trouble because of it." *Id.*

While Rommé professed a belief that he could ignore Chapman's letters based upon Johnson-Hughes' allegedly contrary assurances, the lawyer for Defendants considered the March 7, 2006 letter from the FWS of sufficient importance that he filed a

formal response to the letter with the WV PSC. In his response, Defendants' attorney acknowledged that FWS's recommendations included three years of seasonal vertical radar surveys, seasonal acoustic surveys, seasonal thermal imaging surveys, and surveys to detect Indiana bats and Virginia big-eared bats emerging from local caves during spring, as well as an additional two years of mist-netting surveys. Letter from Lee F. Feinberg, Spilman Thomas & Battle, PLLC, to Sandra Squire, Executive Secretary, W. Va. Pub. Serv. Comm'n, at 2 (Apr. 3, 2006) (Defs.' Ex. 79) (attaching Beech Ridge Energy's response to the March 7, 2006 letter from the FWS). The principal reason cited by Defendants' attorney for opposing these recommendations was the *financial burden* on Defendants and *delaying* construction of the project, not a disagreement as to the merits of the recommended actions. *Id.*

Had Rommé listened more carefully to what he was told repeatedly, Defendants would not be in the unfortunate situation in which they now find themselves. It is clear that Rommé adopted a "minimalist" approach to his responsibilities and that he "neither strained very hard nor looked very far" in his effort to find Indiana bats. *Montgomery County v. Leizman*, 303 A.2d 374, 380 (Md. 1973). Searching for bats near proposed wind turbine locations for one year instead of three,[54] looking in one season rather than three, and using only one method to detect bats was wholly inadequate to a fair assessment.

Second, acceptance of Rommé's testimony would lead one to conclude that there are serious personnel management issues within the FWS, including subordinates routinely countermanding instructions given by superiors. The Court is skeptical of his

[54] BHE conducted a mist-net survey near proposed wind turbine locations in July 2005 and a mist-net survey along the transmission line in June 2006.

testimony, but to the extent that there is any truth to Rommé's characterizations of his conversations with Johnson-Hughes, the FWS should carefully review its procedures to be certain that subordinates do not undermine official communications. The only thing that is clear from the record is that the responses of the FWS to some of the communications from Defendants were relatively slow. *See, e.g.*, Letter from Thomas R. Chapman, Field Supervisor, U.S. Fish and Wildlife Serv., W. Va. Field Office, to Russ Rommé, Director, BHE Envtl., Inc. (Mar. 7, 2006) (Pls.' Ex. 97) (stating that the March 7, 2006 letter was in response to a letter from Rommé dated July 7, 2005).

This Court has concluded that the only avenue available to Defendants to resolve the self-imposed plight in which they now find themselves is to do belatedly that which they should have done long ago: apply for an ITP. The Court does express the concern that any extraordinary delays by the FWS in the processing of a permit application would frustrate Congress' intent to encourage responsible wind turbine development. Assuming that Defendants now proceed to file an application for an ITP, the Court urges the FWS to act with reasonable promptness, but with necessary thoroughness, in acting upon that application.

The development of wind energy can and should be encouraged, but wind turbines must be good neighbors. Accordingly, the Court will, albeit reluctantly, grant injunctive relief as discussed above.[55]

December 8, 2009 /s/
Date Roger W. Titus
United States District Judge

[55] The Court wishes to express its sincere appreciation to Nicolas Mitchell, his law clerk, for extraordinary and invaluable assistance in reviewing the massive record in this case, conducting extensive research, and initial drafting of this opinion.