Post-construction Monitoring Study for the Indiana Crossroads Wind Farm White County, Indiana

Final Report

April 1 – May 15 and August 1 – October 15, 2024

Prepared for:

Indiana Crossroads Wind Farm LLC

801 East 86th Avenue
Merrillville, Indiana 46410

Prepared by:

Lucas Voorhees, Ashley Hedrick, and Simon Weller

Western EcoSystems Technology, Inc.
400 West 7th Street, Suite 200
Bloomington, Indiana 47404

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WEST

EXECUTIVE SUMMARY

Indiana Crossroads Wind Farm LLC, is operating the Indiana Crossroads Wind Farm (Project) in White County, Indiana. The Project became operational in 2021 and consists of 72 4.2-megawatt Vestas V150 wind turbines that have a 105-meter (m) hub height and a 150-m rotor diameter. This report details the third year of post-construction monitoring studies conducted in 2024, consistent with Section 6.6 of the Project's Habitat Conservation Plan (HCP) and the Incidental Take Permit (ITP; ESPER0036249) for Indiana bats and northern long-eared bats (Covered Species). Turbines were feathered below manufacturer cut-in speed (3.0 m per second) from March 15 – July 31 and October 16 – November 15, and below 5.0 m per second in the fall (August 1 – October 15) from sunset to sunrise to minimize direct impacts to Covered Species.

Post-construction monitoring was completed in accordance with the Project's study plan, which was approved by the US Fish and Wildlife Service on March 15, 2024. The Study Plan was designed to achieve a probability of detection, or *g*, of 0.20. The overall goal of this post-construction monitoring study was to generate fatality estimates for the Covered Species and to evaluate compliance with the incidental take authorization granted under the Project's ITP. More specifically, the objectives of this study were to estimate take of Covered Species using the Evidence of Absence (EoA) framework and provide the necessary data to determine if adaptive management is triggered, as outlined in the HCP.

Standardized carcass searches were completed for bat carcasses at three plot types: cleared plots, uncleared plots, and roads and pads. Technicians searched all 72 turbines as roads and pads to a distance of 100 m from the turbine weekly during the spring (April 1 – May 15). In the fall (August 1 – October 15), a technician searched 53 turbines as roads and pads to a distance of 100 m from the turbine, weekly. Detection-dog teams searched 10 turbines as cleared plots with a 70-m radius and nine turbines as uncleared plots in soybean fields with a 70-m radius, twice weekly during the fall. Searcher efficiency and carcass persistence trials were conducted across plot types during each season to correct for detection and scavenger bias.

No Covered Species were found at the Project. One tricolored bat, which is state-endangered and federally proposed for listing as endangered, was recorded at the Project on August 8, 2024. Six evening bats, a state-listed as endangered species, were also found. There were 610 bats found during the study. The most commonly found bat species were eastern red bat (33.0%) and silver-haired bat (30.7%), followed by big brown bat (17.9%), and hoary bat (15.1%). The overall *g* value for 2024 was 0.19 (95% Credible Interval [CrI]: 0.17–0.22) and the average *g* across 2022–2024 was 0.22 (95% CrI: 0.21–0.24). The EoA model estimated the median annual take rate at the Project across 2022–2024 was 0.36 Covered Species. No adaptive management was triggered.

REPORT PARTICIPANTS

Lucas Voorhees	Project Manager
Meredith Rodriguez	Senior Reviewer
Ashley Hedrick	Field Coordinator, Report Compiler
Faith Kulzer	Lead Client Analyst
Simon Weller	Evidence of Absence Analyst and Statistician
Mike True	Post-construction Monitoring Statistician
Britten Vincent	GIS Technician
Christine Kuykendall	Technical Editor

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INTRODUCTION

Indiana Crossroads Wind Farm LLC (Indiana Crossroads), a subsidiary of Northern Indiana Public Service Company, is operating the Indiana Crossroads Wind Farm (Project) in White County, Indiana. Indiana Crossroads obtained an Incidental Take Permit (ITP; ESPER0036249) for the federally endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*M. septentrionalis*; hereafter Covered Species) from the US Fish and Wildlife Service (USFWS), dated March 2, 2022. Post-construction compliance monitoring is required by the ITP to determine if the level of take of the Covered Species is in compliance with the authorized take and to evaluate the need for adaptive management measures.

Western EcoSystems Technology, Inc. (WEST), completed a post-construction monitoring study designed to achieve a probability of detection, or *g*, of 0.20, consistent with the Project's Habitat Conservation Plan (HCP). The objectives of this study were to: estimate take of Covered Species using the Evidence of Absence (EoA) framework as outlined in the HCP and provide the necessary data to determine if adaptive management is triggered. This report presents the results of the third year (Year 3) of the post-construction monitoring conducted at the Project from April 1 – May 15 and August 1 – October 15, 2024.

PERMIT AREA

The Project is located in White County, Indiana, 1.1 kilometer southwest of Reynolds, Indiana (Figure 1). The Project's Permit Area, defined as the Project's leased lands in which all turbines are located, covers approximately 13,259 hectares. Approximately 95% of the Permit Area is composed of cultivated cropland and developed areas (Figure 1).

The Project became fully operational in December 2021 and consists of 72 4.2-megawatt Vestas 150 wind turbines that have a 105-meter (m) hub height and a 150-m rotor diameter (Figure 1). All turbines are within the migratory range of the Covered Species. During the spring, summer, and fall, Indiana Crossroads adjusted turbine operations to minimize impacts to the Covered Species (Table 1).

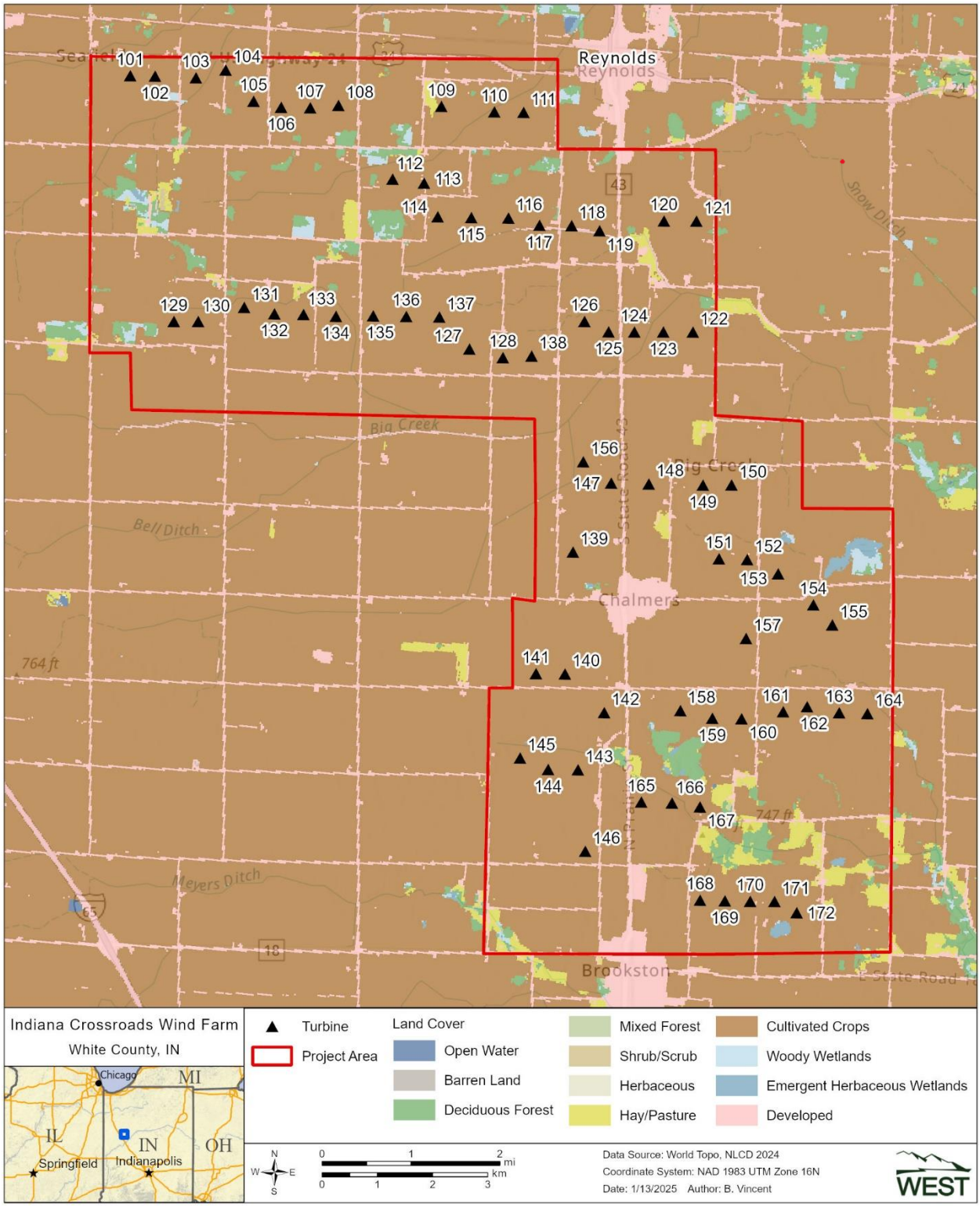

Figure 1. Turbine locations at the Indiana Crossroads Wind Farm, White County, Indiana.

Table 1. Seasonal curtailment regime at the Indiana Crossroads Wind Farm, White County, Indiana.

Season	Turbines	Time of Day	Cut-In Speed	Feathering Below Cut-In[1]?
March 15 – July 31	All	Sunset to sunrise	Manufacturer's rated, minimum of 3.0 m/s[2]	Yes
August 1 – October 15	All	Sunset to sunrise	5.0 m/s	Yes
October 16 – November 15	All	Sunset to sunrise	Manufacturer's rated, minimum of 3.0 m/s[2]	Yes
November 16 – March 14	All	N/A	Manufacturer's setting	No

1. Feathering means that turbine blades will be pitched into the wind such that the blades spin at less than one rotation per minute.

m/s = meters per second; N/A = not applicable.

METHODS

To meet the monitoring commitments in the HCP, WEST developed a study plan that targeted a *g* value of 0.20, using publicly available values for searcher efficiency, carcass persistence, and area correction from data collected at the Project (Rodriguez and Voorhees 2024). Indiana Crossroads submitted a study plan to the USFWS by January 31, 2024 in accordance with the ITP; the study plan was approved by the USFWS on March 15, 2024.

Standardized Carcass Searches

Number of Turbines Sampled, Search Frequency, and Plot Size

Technicians and detection-dog teams conducted standardized carcass searches from April 1 – May 15 and August 1 – October 15, 2024. Search effort varied by season (Table 2, Figure 2) and was designed to maximize search effort when take of the Covered Species was considered most likely to occur.

Table 2. Search effort, by season and plot type, at the Indiana Crossroads Wind Farm, White County, Indiana.

Season	Plot Type	Search Interval	Number of Turbines	Search Team
Spring (April 1 – May 15)	100-m road and pad	7.0 days	72	Technician
Fall (August 1 – October 15)	70-m cleared plot	3.5 days	10	Detection-dog
	70-m uncleared plot	3.5 days	9	Detection-dog
	100-m road and pad	7.0 days	53	Technician

m = meter.

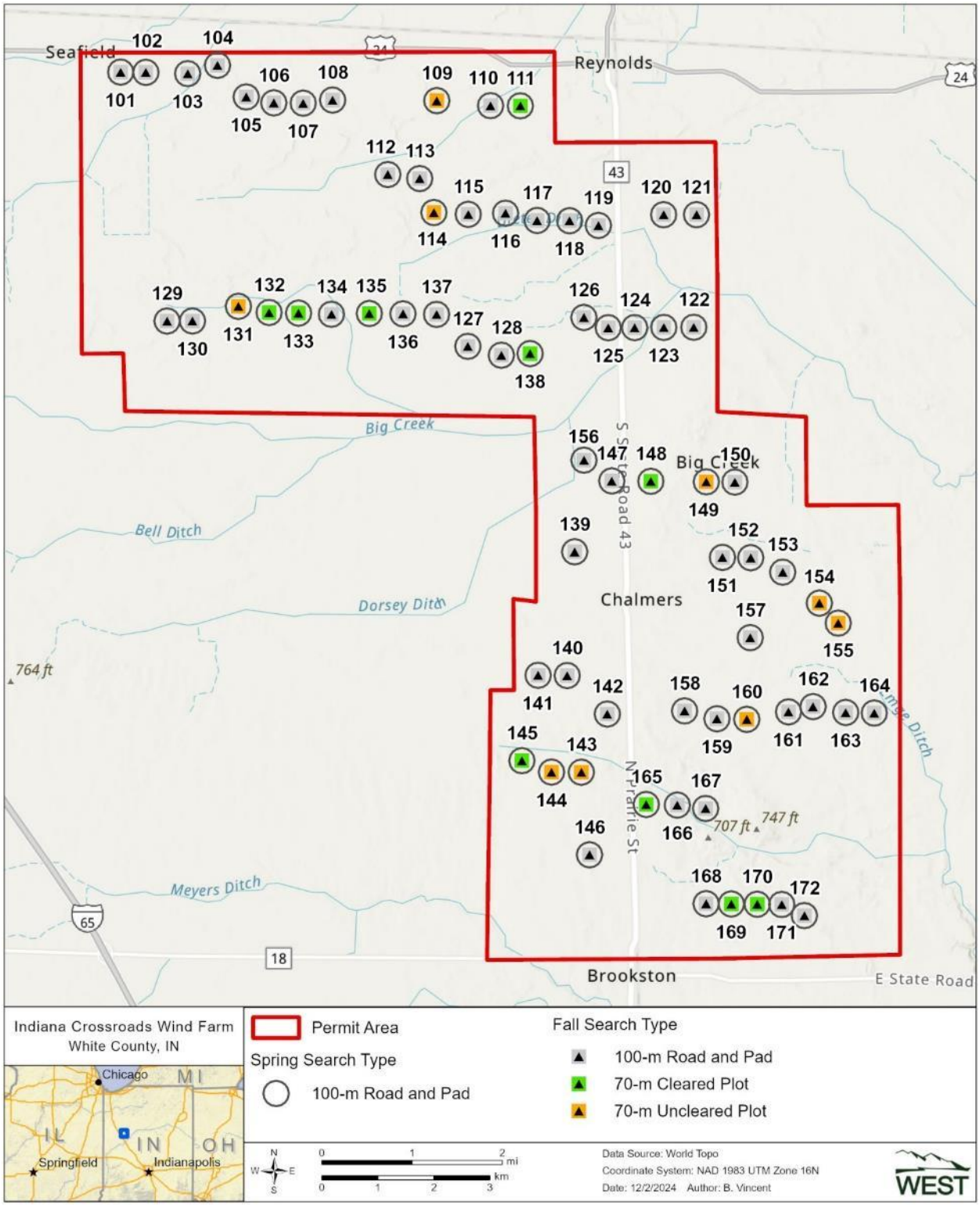

Figure 2. Turbine locations by plot type at the Indiana Crossroads Wind Farm, White County, Indiana.

During spring (April 1 – May 15; Table 2, Figures 2 and 3), a technician searched the gravel roads and pads weekly at all 72 turbines out to a distance of 100 m (100-m roads and pads). During fall (August 1 – October 15), 100-m roads and pads were searched weekly by a technician at 53 turbines (Table 2, Figures 2 and 3). Detection-dog teams searched full plots at 10 turbines where crops were regularly mowed within a 70-m radius (70-m cleared plots; Table 2, Figures 2 and 4) and nine plots at turbines that had standing soybeans (*Glycine max*) as uncleared plots with a 70-m radius (70-m uncleared plots; Table 2, Figures 2 and 5) twice per week in the fall. A cross pattern approximately 1.5 m wide was mowed into the uncleared soybean plots to assist detection-dog teams with plot access.

Search Methods

WEST used two search teams: technicians (who searched visually) and detection-dog teams (which used olfactory searches, consisting of a dog handler and a detection dog). All technicians and dog handlers were trained to follow the Project's study plan, including proper handling and reporting of carcasses. Standardized carcass searches were conducted during the day, beginning as early as first light.

Figure 3. Representative photograph of conditions of a 100-meter road and pad plot at the Indiana Crossroads Wind Farm, White County, Indiana.

Figure 4. Representative photograph of vegetation conditions in a 70-meter cleared plot at the Indiana Crossroads Wind Farm, White County, Indiana.

Figure 5. Representative photograph of vegetation conditions in a 70-meter uncleared plot at the Indiana Crossroads Wind Farm, White County, Indiana.

100-meter Road and Pad Searches – Technician Searches

During 100-m road and pad searches, the technician started 100 m from the turbine and walked the access road at a rate of approximately 45–60 m per minute (m/min) toward the turbine, around the turbine along the gravel pad, and back towards their vehicle. The technician searched out to 2.5 m on each side as they walked, until the entire road/access pad was searched to ensure full visual coverage of each road and pad.

70-meter Plot Searches – Detection-dog Team

Detection-dog teams searched 70-m cleared and uncleared plots for carcasses. Prior to each search, dog handlers determined the search start point and the number of transects needed to cover the plot after taking into account wind speed and direction, as well as crop row direction and density (when applicable). Dog handlers oriented the detection dog to start searches perpendicular to the wind to maximize scent detection. Both wind speed and crop density can affect dispersal of the target odor (i.e., bat carcasses) across the plot. To maximize detection rates during an olfactory search, transect width varied with vegetation density, ranging from 5–10 m apart in densely vegetated areas to 10–15 m apart in shorter vegetation. Detection dogs were rewarded with either food or a short play session when they correctly alerted their handler to a bird or bat carcass.

Detection-dog Team Evaluation

Detection dogs were considered candidates for standardized carcass searches if they met basic temperament and obedience criteria and demonstrated the trainability to detect bird and/or bat carcasses. Temperament characteristics that are sought after are high-energy dogs with a high food or toy drive. Prior to conducting searches at the Project, dog handlers trained their detection dogs on the scent of bat carcasses, following methods derived from search and rescue programs and drug detection (Helfers 2017, Kay 2012). Detection dogs were initially trained on cotton scent swabs rubbed on or stored in a container with bat carcasses, and progressed to bat carcasses at increasing distances over a period of three to four weeks. Once the detection dog achieved a passing grade of 80% or higher in a scent recognition test, consisting of 10 blind trial lineups using bat carcasses, the detection dog and handler were evaluated in the field to measure the team's performance. The detection-dog coordinator conducted a field evaluation of each detection-dog team. After a detection-dog team achieved a searcher efficiency of 75% or greater for 10 or more bats during evaluation trials, the team was approved to conduct standardized carcass searches. Because the objective of the study was to document bat carcasses, detection dogs were not explicitly trained on native bird carcasses; however, all detection dogs alerted their handler when they found birds in the field and handlers rewarded bird finds to encourage future alerts to bird carcasses. The breeds used at the Project as detection dogs were a German shepherd, Belgian Malinois, and working line cocker spaniel (*Canis lupus familiaris*).

Data Collection

Technicians and dog handlers recorded the date, search start and end times, technician or dog handler name, turbine number, type of search, and if any carcasses were found during each scheduled search. When a bird or bat carcass was found, a flag was placed near it and the search continued. After searching the entire plot, the technician or dog handler returned to record

information for each carcass on a carcass information form, including the date and time the carcass was found, species (or best possible field identification), sex and age (when possible), technician or dog handler name, turbine number, measured distance from turbine (m), azimuth from turbine, location of the carcass as latitude and longitude, habitat surrounding the carcass, carcass condition, and estimated time of death (e.g., less than one day, two days).

The condition of each carcass found was recorded using the following categories:

- Intact—a carcass that was complete, not badly decomposed, and showed no sign of being fed upon by a predator or scavenger.
- Scavenged—an entire carcass that showed signs of being fed upon by a predator or scavenger, or a portion(s) of a carcass in one location (e.g., wings, skeletal remains, portion of a carcass), or a carcass that was heavily infested by insects.
- Dismembered—a carcass that was found in multiple pieces distributed more than 1.0 m apart from one another due to scavenging or other reasons.
- Injured—a bat or bird that was found alive.

For bird carcasses, the following category was also used:

- Feather spot—Ten or more feathers (excluding down), or two or more primary feathers found at one location (i.e., one square m), indicating predation or scavenging of a bird carcass.

Digital photographs were taken of each carcass, including any visible injuries and surrounding habitat. No bird carcasses were collected, but a marker was placed next to each bird carcass to avoid duplicate counting. Bat carcasses were collected under the Project's ITP (ESPER0036249), WEST's Federal Native Endangered and Threatened Species Recovery Permit (ES23412), and WEST's Special Purpose Salvage Permit (2263). Technicians or dog handlers placed all bat carcasses in a re-sealable plastic bag, labeled with the unique carcass identification number, turbine number, and date, for storage in a freezer on site. Leather and rubber gloves were used to handle all bat carcasses to eliminate possible transmission of rabies or other diseases. Live, injured bats were recorded and considered fatalities for analysis purposes when observed in search areas and were left in place.

Bird and bat carcasses found in non-search areas (e.g., outside of a plot boundary) or outside of the scheduled study period were recorded as incidental discoveries and documented following the same protocol for those found during standard searches, but were not included in analysis.

Carcass Identification and Agency Notification

Field identification of bird carcasses were reviewed by biologists with extensive field experience in identification of Midwestern birds and feathers. Federally permitted bat biologists (ESPER0039249 and ES234121) identified all bat carcasses via photographs or in hand. Bat carcasses that were heavily scavenged but did not have potential to be a Covered Species (i.e., fur was present on the wing and/or forearms measured greater than 41 millimeters and

lacked notches in claws) were identified to the closest genus or group possible and were not sent off for further identification. In accordance with the Project's ITP and WEST's state and federal salvage permits, the USFWS would be notified within 24 hours of positive identification of federally listed species and the Indiana Department of Natural Resources (IDNR) would be notified within three working days of positive identification of state-listed species. All bat carcasses, as well as fur and tissue samples, were submitted to the Illinois Natural History Survey repository, at the direction of USFWS and in accordance with permits (J. Wieringa, USFWS, pers. comm., August 29, 2024).

Tissue samples were collected from heavily scavenged or decomposed bat carcasses that could not be positively identified and had potential to be a Covered Species, and were submitted to a USFWS-approved laboratory (East Stroudsburg University Wildlife Genetics Institute) for identification.

Bias Trials

Searcher Efficiency Trials

The objective of searcher efficiency trials was to estimate the probability that a carcass was found by a technician or detection-dog team. Searcher efficiency trials were conducted in the same areas where standardized carcass searches occurred. Technicians or detection-dog teams conducting standardized carcass searches did not know when searcher efficiency trials were being conducted or the location of the trial carcasses. Trial carcasses consisted of eastern red bats (*Lasiurus borealis*), big brown bats (*Eptesicus fuscus*), hoary bats (*L. cinereus*), and silver-haired bats (*Lasionycteris noctivagans*) that had previously been found at the Project. There were 114 carcasses placed across all seasons and plot types to account for differences in search conditions by plot type and season.

Multiple trials were conducted in each season to measure potential changes in plot conditions on searcher efficiency over time. Each trial carcass was discreetly marked with a black zip-tie and/or a piece of electrical tape around the upper forelimb for identification as a trial carcass after it was found. Carcasses were dropped from waist-height or higher and allowed to land in a random posture. Trials for detection-dog teams were dropped the day prior to the next search to allow time for the scent to pool and disperse prior to scheduled searches.

Searchers had one chance to locate trial carcasses during the first search after carcass placement. The number and location of trial carcasses found during the subsequent search were recorded, and the number of trial carcasses available during each search was determined immediately after each trial.

Carcass Persistence Trials

The objective of carcass persistence trials was to estimate the length of time (in days) a carcass would persist, or be available for detection, in the field. Carcasses could be removed by scavenging or rendered undetectable by typical farming activities. A minimum of 15 trial carcasses were placed in each season and plot type to incorporate the effects of varying weather and

scavenger densities on carcass persistence. No more than three trial carcasses were placed on a plot at a time to avoid potential over-seeding and attracting scavengers. There were 60 searcher efficiency trial carcasses left in place and used for carcass persistence trials and an additional three trial carcasses were dropped, for a total of 63 trial carcasses placed across all seasons and plot types.

Technicians monitored the trial carcasses over a 14-day period according to the following schedule, as closely as possible: carcasses were checked daily for the first four days, then on days 7, 10, and 14. Trial carcasses were monitored until they were completely removed or the trial period ended, whichever occurred first. At the end of the 14-day period, any remaining carcasses were removed. Detection-dog teams were used on all 70-m plots to determine when carcasses were removed, while technicians determined the status of carcasses placed on 100-m roads and pads.

Search Area Mapping

Technicians recorded the boundaries of 70-m cleared plots using a Juniper Geode sub-meter Global Positioning System unit. Unsearchable areas within plot boundaries were also mapped. Plot boundaries were used to verify if carcasses were found inside the search areas and to inform the distribution of carcasses around turbines to estimate the number of carcasses that fell inside or outside search areas. A 72-m radius projection was applied to 70-m uncleared plots. The additional two m were added to the radius to account for the width of the turbine tower. Road and pad boundaries mapped in the first year (2022; Year 1) were used for spatial verification of carcasses found on 100-m roads and pads.

Quality Assurance and Quality Control

Quality assurance and quality control measures were implemented at all stages of the study, including in the field, during data entry and analysis, and report writing. Following searches, technicians were responsible for inspecting data forms for completeness, accuracy, and legibility. Potentially erroneous data were identified using a series of database queries. Irregular codes or data suspected as questionable were discussed with the technician and/or Project manager. Errors, omissions, or problems identified in later stages of analysis were traced back to the raw data forms and appropriate changes and measures were implemented. A Microsoft® SQL database was developed to store, organize, and retrieve search data. All data forms and electronic data files were retained for reference.

Statistical Analysis

The EoA (Dalthorp et al. 2017) modeling framework was used to estimate take of the Covered Species. Data used in the EoA model included the number of found Covered Species carcasses, fatality spatial data from all bats found during searches, and the results of searcher efficiency and carcass persistence trials.

Searcher Efficiency Estimation

Searcher efficiency was estimated separately for technicians and detection-dog teams to account for different modes of detection (i.e., technicians use sight while dogs use scent). EoA uses raw searcher efficiency data (e.g., number of found and available trial carcasses) to inform overall probability of detection. However, to determine if searcher efficiency data should be pooled or separated by strata, such as season and/or plot type, searcher efficiency was modeled using logistic regression. Season was included as a potential covariate for the technician model and plot type was included as a potential covariate for the detection-dog team model. For both the technician and detection-dog models, selection was completed using an information theoretic approach known as AICc, or corrected Akaike Information Criterion (Burnham and Anderson 2002). The most parsimonious model within two AICc units of the model with the lowest AICc value was selected as the best-supported model. Searcher efficiency values were input into the EoA software according to the model selection results.

The change in searcher efficiency between successive searches was defined by a parameter called the detection reduction factor (k) that can range from zero to one. When k is zero, it implies a carcass that was missed on the first search would never be found on subsequent searches. A k of one implies searcher efficiency remained constant no matter how many times a carcass was missed. Huso et al. (2017) estimated a value of $k = 0.67$ for bats and this value was used to calculate estimates for the Covered Species in EoA.

Carcass Persistence Rate Estimation

Data collected during carcass persistence trials were used to estimate the amount of time, in days, carcasses remained available to be located by the technician or detection-dog team. The average probability a carcass persisted through the search interval (i.e., the time between scheduled searches) was estimated using an interval-censored survival regression with four potential distributions: exponential, loglogistic, lognormal, and Weibull distributions (Dalthorp et al. 2018, Kalbfleisch and Prentice 2002). As with searcher efficiency, carcass persistence models were estimated separately by search team to account for different modes of detection. Season was included as a potential covariate for the technician model and plot type was included as a potential covariate for the detection-dog team model. The best-supported model was selected as the most parsimonious model within two AICc units of the model with the lowest AICc value. The parameter estimates of the selected model (shape and scale, including the 95% CI of scale) were used as inputs in the EoA Single Class Module.

Search Area Adjustment

The search area adjustment accounted for unsearched areas beneath turbines and was calculated as a probability that ranged from zero to one. The area adjustment was estimated as the product of the searched area around each turbine and a carcass-density distribution. The proportion of area searched was calculated in a geographic information system as the amount of area searched divided by the total area searched at each 1.0-m annulus around the turbine. A truncated weighted maximum likelihood (TWL) modeling approach (Khokan et al. 2013) was used to estimate the carcass-density distribution using site-specific fatality locations. The TWL approach uses weight -based probability of detection and the proportion of area searched in each

1.0-m annulus around the turbine. Although the spring and fall seasons have the potential to have different carcass density distributions due to differences in turbine operation, there was insufficient sample size in the spring to examine these effects. Therefore, the models pooled data from both turbine operation regimes and seasons. Distributions considered were normal, gamma, Gompertz, and Weibull (parameterized according to R Development Core Team [2016], Yee [2010]). The best-supported model was selected using AICc.

Carcasses Excluded from Fatality Estimates

Fatalities were excluded from the area adjustment used in EoA when the carcass was discovered outside of the spatial and temporal scope of the study design. For example, carcasses found outside a designated plot were not included in the analysis because the area adjustment accounts for the carcass by adjusting for unsearched areas. Carcasses found prior to the start of searches (e.g., a carcass found on a plot in the summer that was not searched until the fall) were also excluded because the carcass occurred outside of the study period. Note that carcasses found on a plot incidentally were included in the analysis if that plot had a scheduled search during the next round of searches. If a fatality of a Covered Species had been found outside of the spatial or temporal scope of the study design, it would have been excluded from the area correction estimate but would be included in the EoA fatality estimate, following Dalthorp et al. (2020).

Covered Species Take and Arrival Proportions

EoA was used to estimate the mean annual take rate (λ) for the Covered Species and the probability of detection (*g*). Estimates were calculated using the EoA method (Dalthorp et al. 2017), using the Single Class, Multiple Class, and Multiple Years modules of EoA.

Detection Probability and Density Weighted Proportion

The probability of detection (*g*) was estimated using the bias corrections for searcher efficiency, carcass persistence, and area searched, as well as the assumed seasonality of risk for the Covered Species, which was 11% in spring and 89% in fall per the Project's study plan. The monitoring and bias trial data were separated into search strata, where each search stratum was defined by a number of turbines, a plot type, a search frequency, the proportion of days in the study period, and a weight that represented the relative risk within the stratum to estimate $g_{stratum}$. Strata were defined to ensure that all the factors that defined them were identical within strata. The EoA Single Class module was used to estimate $g_{stratum}$, in each search stratum. This resulted in Ba and Bb parameters that defined the beta distribution of $g_{stratum}$ in each stratum.

The Multiple Class module of the EoA Graphical User Interface (GUI) was then used twice, once to develop the distribution of *g* for each season (g_{season}) by combining $g_{stratum}$ (e.g., fall 100-m roads and pads, 70-m cleared plots, and 70-m uncleared plots), using the appropriate weights, and again to develop the distribution of *g* for the study period by combining g_{season}, using the appropriate weights. Weights ("DWP" in the software) represent the relative fatality risk within each search stratum or season and are used for combining detection probabilities. For each stratum, the DWP was calculated as the product of a number of different weights, which are described in the sections below. DWP within seasons were rescaled to sum to one before

calculating seasonal detection probabilities, as required by the EoA GUI. For example, 100-m roads and pads would obtain a weight as the product of the within-season sampling fraction and relative turbine operations, re-scaled so that all seasonal weights sum to one. DWP for combining across seasons within the study period were calculated as the product of the seasonal arrival proportions and relative turbine operations, re-scaled to sum to one within the study period.

For this study, cross-season relative turbine operations were calculated as the number of operational nights in each season, during which turbines were operating, divided by the total number of operational nights in each season. Given that nominal turbine operations at the Project includes downtime for regular maintenance, operations were considered normal unless the proportion of operational turbine nights was less than 90% of total turbine nights during the study period. Cross-season relative turbine operations and the arrival proportions were multiplied and then re-scaled to sum to one across seasons. On an annual basis, the proportion of operational-turbine nights was greater than 0.9, and the full bat active season was surveyed, so ρ was set to one for the 2024 study.

Adaptive Management Trigger

Table 6.5 in the HCP outlines several conditions for adaptive management at the Project. Two conditions are based on bats in hand (i.e., either two or more Indiana bat or northern-long eared bat carcasses found in Years 1–2, or a single Indiana bat or northern long-eared bat carcass found in either the spring or the summer of any year). The remaining conditions for adaptive management are based on EoA estimates. The estimates from the EoA analysis were used to test the adaptive management triggers that the median (50^{th} credible bound) annual take rates (λ) were between one and three bats per year, or greater than three bats per year at Year 3, per the HCP. Outcomes for meeting individual adaptive management triggers would be followed in accordance with the actions outlined in Table 6.5 of the Project's HCP. The adaptive management triggers were tested and reviewed individually for each of the Covered Species. Three years of data were used in this analysis, 2022–2024.

RESULTS

Standardized Carcass Searches

There were 497 searches completed in the spring and 1,030 searches completed in the fall. There were 37 searches (2.4%) missed due to turbine maintenance, weather constraints, and/or safety hazards. There were 610 bat carcasses and 199 bird carcasses found during searches and incidentally (Appendix A). No Covered Species were found at the Project. One tricolored bat (*Perimyotis subflavus*), a state-endangered and federally proposed as endangered species, was recorded at the Project on August 8, 2024. Six evening bats (*Nycticeius humeralis*), a state-listed as endangered species, were documented at the Project. No other federally or state listed species were recorded during the ITP monitoring effort.

There were 38 bats found in the spring and 569 bats found in the fall. Three bats were found incidentally outside of the monitoring period on May 29, June 7, and June 17, 2024 (Appendix A).

The most commonly found bat species were eastern red bat (201 carcasses; 33.0%) and silver-haired bat (187; 30.7%) followed by big brown bat (109; 17.9%), and hoary bat (92; 15.1%; Appendix A). Six eastern red bat or Seminole bat (*Lasiurus seminolus*; 1.0%), six unidentified Lasiurus bats (1.0%), six evening bats (1.0%), two unidentified non-*Myotis* bats (0.3%), and one tricolored bat (0.2%) were also found (Appendices A and B). The majority of bat carcasses were recorded on 70-m cleared and uncleared plots searched by detection-dog teams (Appendix A). Over the course of the monitoring period, 26 heavily scavenged bats (e.g., wing membrane only, bones, or partial carcasses) were sent off for identification via deoxyribonucleic acid (DNA) analysis. Two samples failed to isolate mammal DNA as a result of decomposition and were reviewed by a permitted bat biologist in hand who determined both to be unidentified non-*Myotis* bats. The remaining samples were identified as 11 big brown bats, five silver-haired bats, five hoary bats, and three eastern red bats.

Statistical Analysis

Bias Trials

Searcher Efficiency Trials

There were 114 bats placed for searcher efficiency trials on 12 separate dates across all plot types and months of the study and 87 were available for search teams to find (Table 3). The best-supported model for searcher efficiency for detection-dog teams did not support the inclusion of plot type as a covariate, meaning there was not a substantial difference between searcher efficiency rates on 70-m cleared and uncleared plots. The best-supported model for searcher efficiency on 100-m roads and pads did not support the inclusion of season as a covariate, meaning there was not a substantial difference in searcher efficiency rates for 100-m roads and pads between seasons. Searcher efficiency rates were 64.3% on 70-m cleared and uncleared plots and 75.6% on 100-m roads and pads (Table 3).

Table 3. Searcher efficiency results by plot type at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Searcher Efficiency Model	Season	Plot Type	Number Placed	Number Available	Number Found	% Found
Detection-dog team	Fall	70-m cleared plots	29	21	14	66.7
		70-m uncleared plots	30	21	13	61.9
Overall*			**59**	**42**	**27**	**64.3**
Technicians	Spring	100-m road and pad	26	22	19	86.4
Technicians	Fall	100-m road and pad	29	23	15	65.2
Overall*			**55**	**45**	**34**	**75.6**

* Selected model.

Carcass Persistence Trials

There were 63 carcasses placed during the study period to estimate carcass persistence. The best-fit model for carcass persistence rates on 70-m plots searched by detection-dog teams had a Weibull distribution and did not include any covariates, which suggests carcass persistence rates did not vary by plot type (Figure 6; Appendix B). The best-fit model for carcass persistence rates on 100-m roads and pads searched by technicians had an exponential distribution and did not include any covariates, meaning that carcass persistence on roads and pads did not vary by

season (Figure 6; Appendix B). Estimated median carcass persistence times were 6.18 days on 70-m plots and 4.06 days on 100-m roads and pads (Appendix B).

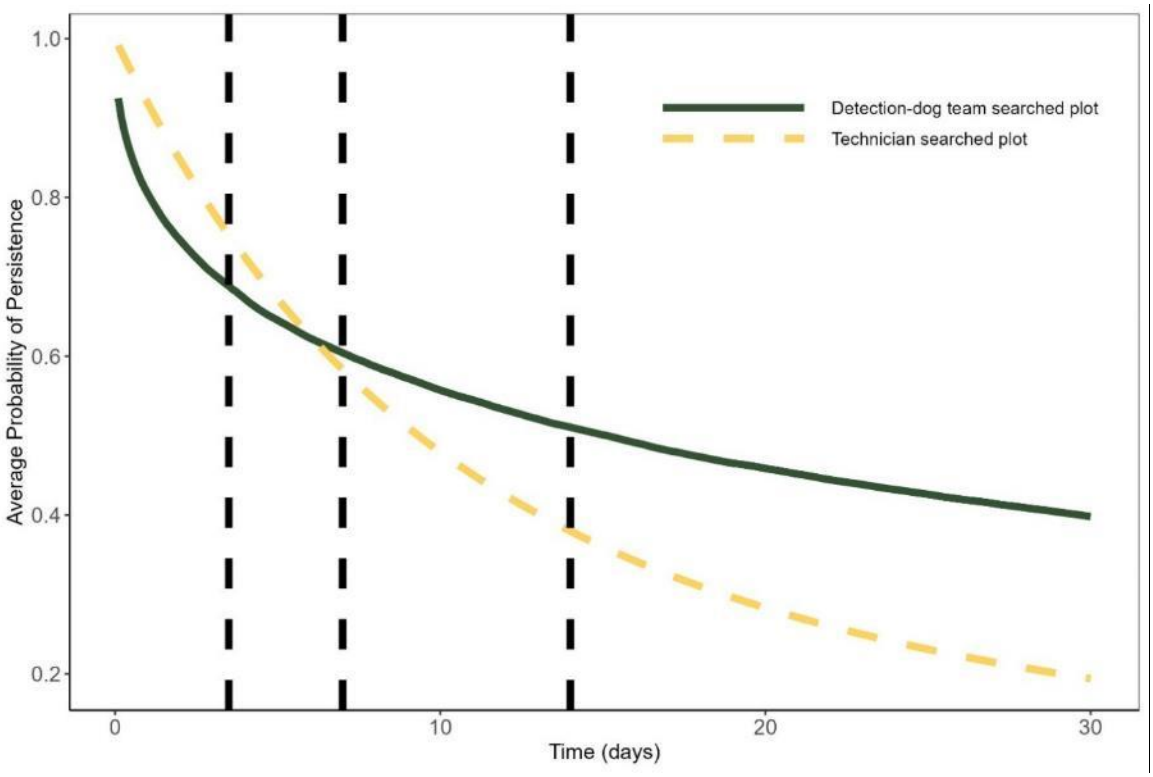

Figure 6. The average probability of persistence of bats on over time (in days) at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Note: The vertical dashed lines indicate the 3.5-, 7-, and 14-day search intervals used in this study.

Search Area Adjustment

Of the 610 bats found, 59 were excluded from modeling the search area adjustment for EoA. Five bat carcasses were excluded from analysis because they were found off-plot. Another 54 bats were excluded because their estimated time of death was prior to the start of the monitoring season (Appendices A and B).

The best-fit model for the distribution of bats with respect to distance from turbine base was a Weibull distribution (Appendix B). The estimated TWL area adjustment for bats was 0.23 for 100-m roads and pads and 0.86 for 70-m plots (Figure 7; Appendix B).

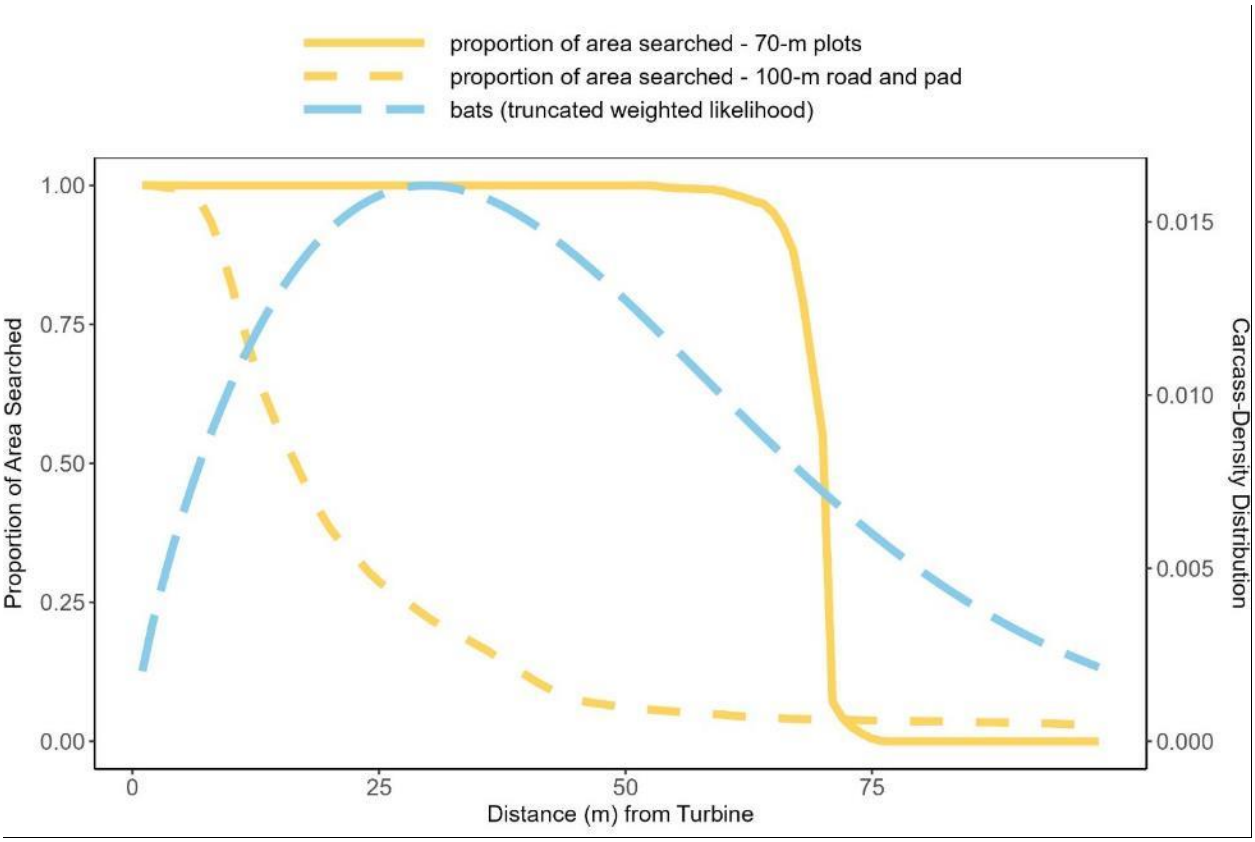

Figure 7. Density of bat carcasses per area searched at all plots types at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15, and August 1 – October 15, 2024.

Covered Species Take Estimates

No Covered Species were found during the 2024 study period and no Indiana bats or northern long-eared bats have been found to-date under the ITP. The overall *g* achieved for the 2024 monitoring period had a mean of 0.193 (95% CrI: 0.168–0.219). The average overall *g* achieved for the 2022–2024 monitoring years had a mean of 0.225 (95% CrI: 0.210–0.240; Table 4).

Table 4. Probability of detection (*g*), Ba, and Bb for the Indiana Crossroads Wind Farm, White County, Indiana, from 2022–2024.

Year	Ba	Bb	*g*	95% CrI
2022	122.085	485.401	0.201	0.170–0.234
2023	444.494	1,161.188	0.277	0.255–0.299
2024	174.923	731.007	0.193	0.168–0.219
Overall	**655.372**	**2,258.427**	**0.225**	**0.210–0.240**

Ba and Bb are the parameters for the beta distribution used to characterize the probability of detection. The *g* value is the mean of that distribution.

CrI = Credible Interval.

Evidence of Absence Framework

The median annual take rate from 2022–2024 was estimated to be 0.36 (95% CrI: 0–3.94) for both Indiana bats and 0.36 and northern long-eared bats (Table 5). Inputs required to run the EoA

Single Class Module and stratum-specific *g* distribution values and inputs required for the Multiple Class Module are described in Appendix C.

Adaptive management criteria were assessed using the median annual take rate from Years 1–3. The estimated annual take rate must be greater than or equal to one (defined in the HCP as the "expected" take rate; Table 5) to trigger adaptive management. The estimated take rate for Indiana bat and northern long-eared bat did not exceed one; therefore, the criteria for adaptive management was not met and no adaptive management actions are necessary at this time (Table 5). Neither species' estimated take rate exceeded the authorized take rate. In this case, per Table 6.5 in the HCP, the Project will continue operational minimization as planned and will monitor at *g* = 0.08 for the remaining three years of the ITP.

Table 5. Estimated median fatality rate (λ) for the Covered Species based on studies conducted at the Indiana Crossroads Wind Farm, White County, Indiana, ITP Years 1–3 (2022–2024).

Species	Carcass Count	Median λ (95% CrI)	Expected Take Rate	Authorized Take Rate
Indiana bat	0	0.36 (0–3.94)	1	3
Northern long-eared bat	0	0.36 (0–3.94)	1	3

CrI = Credible Interval; ITP = Incidental Take Permit.

CONCLUSIONS

The overall *g* achieved for the first three years of monitoring exceeded the target average *g* of 0.20; therefore, no increased effort beyond the target *g* value of 0.08 is necessary in Year 4, as specified in section 6.4.2 of the HCP. No Covered Species were found to date under the ITP. The ITP compliance monitoring completed during 2024 provided evidence that the rate of take of Covered Species is compatible with ITP compliance over the duration of the permit term. Adaptive management triggers were evaluated using the EoA results and, due to the average annual take of Indiana bats and northern long-eared bats being less than one bat per year at Year 3, operational minimization will continue as planned (Indiana Crossroads 2022).

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Appendix A. Carcasses Found during the 2024 Post-construction Monitoring Searches at the Indiana Crossroads Wind Farm, White County, Indiana

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
Bat Carcasses							
4/11/2024	silver-haired bat	130	carcass search	100-m road and pad	intact	-86.96230	40.70728
4/12/2024	big brown bat	143	carcass search	100-m road and pad	scavenged	-86.87945	40.63529
4/16/2024	eastern red bat	111	carcass search	100-m road and pad	scavenged	-86.89387	40.74234
4/17/2024	silver-haired bat	127	carcass search	100-m road and pad	intact	-86.90428	40.70392
4/17/2024	silver-haired bat	128	carcass search	100-m road and pad	dismembered	-86.89718	40.70229
4/17/2024	silver-haired bat	148	carcass search	100-m road and pad	intact	-86.86521	40.68209
4/18/2024	eastern red bat	142	carcass search	100-m road and pad	intact	-86.87395	40.64469
4/22/2024	eastern red bat	120	carcass search	100-m road and pad	intact	-86.86265	40.72505
4/22/2024	silver-haired bat	111	carcass search	100-m road and pad	scavenged	-86.89346	40.74230
4/25/2024	eastern red bat	131	carcass search	100-m road and pad	intact	-86.95289	40.70895
4/26/2024	hoary bat	165	carcass search	100-m road and pad	intact	-86.86527	40.63015
4/26/2024	silver-haired bat	158	carcass search	100-m road and pad	scavenged	-86.85786	40.64498
4/29/2024	silver-haired bat	101	carcass search	100-m road and pad	scavenged	-86.97794	40.74747
4/29/2024	silver-haired bat	101	carcass search	100-m road and pad	scavenged	-86.97799	40.74733
4/29/2024	silver-haired bat	105	carcass search	100-m road and pad	scavenged	-86.95093	40.74338
4/29/2024	silver-haired bat	110	carcass search	100-m road and pad	scavenged	-86.89946	40.74219
4/29/2024	silver-haired bat	122	carcass search	100-m road and pad	scavenged	-86.85590	40.70694
4/29/2024	silver-haired bat	122	carcass search	100-m road and pad	scavenged	-86.85675	40.70698
4/29/2024	silver-haired bat	123	carcass search	100-m road and pad	scavenged	-86.86189	40.70693
5/1/2024	eastern red bat	135	carcass search	100-m road and pad	scavenged	-86.92509	40.70875
5/1/2024	silver-haired bat	128	carcass search	100-m road and pad	intact	-86.89722	40.70230
5/1/2024	silver-haired bat	129	carcass search	100-m road and pad	intact	-86.96746	40.70730
5/1/2024	silver-haired bat	147	carcass search	100-m road and pad	intact	-86.87351	40.68211
5/6/2024	big brown bat	101	carcass search	100-m road and pad	scavenged	-86.97797	40.74735
5/6/2024	evening bat	106	carcass search	100-m road and pad	scavenged	-86.94584	40.74226
5/6/2024	silver-haired bat	102	carcass search	100-m road and pad	scavenged	-86.97292	40.74721
5/6/2024	silver-haired bat	118	carcass search	100-m road and pad	scavenged	-86.88279	40.72380
5/6/2024	silver-haired bat	124	carcass search	100-m road and pad	scavenged	-86.86909	40.70702
5/9/2024	evening bat	133	carcass search	100-m road and pad	intact	-86.93991	40.70869
5/9/2024	silver-haired bat	128	carcass search	100-m road and pad	scavenged	-86.89737	40.70217
5/10/2024	big brown bat	169	carcass search	100-m road and pad	scavenged	-86.84785	40.61433
5/10/2024	eastern red bat	140	carcass search	100-m road and pad	scavenged	-86.88243	40.65086
5/10/2024	evening bat	157	carcass search	100-m road and pad	scavenged	-86.84368	40.65720
5/10/2024	silver-haired bat	135	carcass search	100-m road and pad	dismembered	-86.92483	40.70866
5/10/2024	silver-haired bat	157	carcass search	100-m road and pad	scavenged	-86.84386	40.65708

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
5/14/2024	hoary bat	124	carcass search	100-m road and pad	scavenged	-86.86883	40.70685
5/15/2024	eastern red bat	168	carcass search	100-m road and pad	intact	-86.85299	40.61418
5/15/2024	silver-haired bat	130	carcass search	100-m road and pad	scavenged	-86.96208	40.70735
5/29/2024	silver-haired bat	107	incidental*	N/A	scavenged	-86.94022	40.74225
6/7/2024	eastern red bat	109	incidental*	N/A	scavenged	-86.91105	40.74315
6/17/2024	big brown bat	168	incidental*	N/A	scavenged	-86.85323	40.61406
7/30/2024	big brown bat	165	carcass search *	70-m cleared	scavenged	-86.86608	40.62983
7/30/2024	eastern red bat	165	carcass search *	70-m cleared	intact	-86.86565	40.63027
7/30/2024	eastern red bat	166	carcass search *	100-m road and pad	scavenged	-86.85870	40.63027
7/30/2024	evening bat	160	carcass search *	70-m uncleared	scavenged	-86.84468	40.64423
7/30/2024	hoary bat	148	carcass search *	70-m cleared	scavenged	-86.86523	40.68213
7/30/2024	hoary bat	148	carcass search *	70-m cleared	scavenged	-86.86513	40.68193
7/30/2024	hoary bat	149	carcass search *	70-m uncleared	scavenged	-86.85384	40.68236
7/30/2024	hoary bat	149	carcass search *	70-m uncleared	scavenged	-86.85365	40.68213
7/30/2024	hoary bat	160	carcass search *	70-m uncleared	scavenged	-86.84505	40.64399
7/30/2024	hoary bat	165	carcass search *	70-m cleared	scavenged	-86.86582	40.62992
8/1/2024	big brown bat	108	carcass search	100-m road and pad	scavenged	-86.93307	40.74296
8/1/2024	big brown bat	115	carcass search	100-m road and pad	scavenged	-86.90369	40.72477
8/1/2024	eastern red bat	105	carcass search	100-m road and pad	scavenged	-86.95123	40.74330
8/1/2024	hoary bat	106	carcass search	100-m road and pad	scavenged	-86.94520	40.74221
8/1/2024	hoary bat	149	carcass search	70-m uncleared	scavenged	-86.85359	40.68225
8/1/2024	big brown bat	104	carcass search *	100-m road and pad	dismembered	-86.95746	40.74828
8/1/2024	big brown bat	116	carcass search *	100-m road and pad	scavenged	-86.89649	40.72502
8/1/2024	big brown bat	165	carcass search *	70-m cleared	scavenged	-86.86568	40.63057
8/1/2024	eastern red bat	119	carcass search *	100-m road and pad	scavenged	-86.87636	40.72259
8/1/2024	eastern red bat	155	carcass search *	70-m uncleared	scavenged	-86.82558	40.65942
8/1/2024	hoary bat	104	carcass search *	100-m road and pad	scavenged	-86.95769	40.74842
8/1/2024	hoary bat	119	carcass search *	100-m road and pad	scavenged	-86.87643	40.72260
8/1/2024	hoary bat	155	carcass search *	70-m uncleared	scavenged	-86.82541	40.65983
8/1/2024	unidentified lasiurus bat	165	carcass search *	70-m cleared	dismembered	-86.86582	40.62993
8/2/2024	big brown bat	122	carcass search	100-m road and pad	scavenged	-86.85612	40.70684
8/2/2024	big brown bat	143	carcass search	70-m uncleared	scavenged	-86.87951	40.63530
8/2/2024	big brown bat	145	carcass search	70-m cleared	scavenged	-86.89175	40.63699
8/2/2024	big brown bat	162	carcass search	100-m road and pad	intact	-86.83042	40.64583
8/2/2024	hoary bat	140	carcass search	100-m road and pad	scavenged	-86.88244	40.65080
8/2/2024	hoary bat	144	carcass search	70-m uncleared	scavenged	-86.88564	40.63547

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/2/2024	big brown bat	122	carcass search *	100-m road and pad	dismembered	-86.85644	40.70696
8/2/2024	big brown bat	132	carcass search *	70-m cleared	scavenged	-86.94603	40.70882
8/2/2024	big brown bat	147	carcass search *	100-m road and pad	scavenged	-86.87337	40.68203
8/2/2024	big brown bat	159	carcass search *	100-m road and pad	scavenged	-86.85057	40.64414
8/2/2024	big brown bat	161	carcass search *	100-m road and pad	dismembered	-86.83620	40.64522
8/2/2024	big brown bat	162	carcass search *	100-m road and pad	scavenged	-86.83065	40.64583
8/2/2024	big brown bat	167	carcass search *	100-m road and pad	dismembered	-86.85304	40.62962
8/2/2024	big brown bat	169	carcass search *	70-m cleared	scavenged	-86.84758	40.61488
8/2/2024	big brown bat	169	carcass search *	70-m cleared	scavenged	-86.84745	40.61430
8/2/2024	eastern red bat	122	carcass search *	100-m road and pad	scavenged	-86.85644	40.70687
8/2/2024	eastern red bat	132	carcass search *	70-m cleared	scavenged	-86.94652	40.70900
8/2/2024	eastern red bat	143	carcass search *	70-m uncleared	scavenged	-86.87924	40.63575
8/2/2024	eastern red bat	144	carcass search *	70-m uncleared	scavenged	-86.88604	40.63552
8/2/2024	eastern red bat	145	carcass search *	70-m cleared	scavenged	-86.89191	40.63702
8/2/2024	eastern red bat	168	carcass search *	100-m road and pad	scavenged	-86.85319	40.61437
8/2/2024	eastern red bat	169	carcass search *	70-m cleared	scavenged	-86.84698	40.61408
8/2/2024	eastern red bat	169	carcass search *	70-m cleared	scavenged	-86.84746	40.61423
8/2/2024	eastern red bat	169	carcass search *	70-m cleared	scavenged	-86.84758	40.61429
8/2/2024	evening bat	169	carcass search *	70-m cleared	scavenged	-86.84738	40.61459
8/2/2024	hoary bat	111	carcass search *	70-m cleared	scavenged	-86.89331	40.74220
8/2/2024	hoary bat	131	carcass search *	70-m uncleared	dismembered	-86.95247	40.70927
8/2/2024	hoary bat	132	carcass search *	70-m cleared	scavenged	-86.94631	40.70877
8/2/2024	hoary bat	144	carcass search *	70-m uncleared	scavenged	-86.88636	40.63524
8/2/2024	hoary bat	156	carcass search *	100-m road and pad	scavenged	-86.87923	40.68497
8/2/2024	hoary bat	169	carcass search *	70-m cleared	scavenged	-86.84790	40.61489
8/2/2024	hoary bat	169	carcass search *	70-m cleared	scavenged	-86.84800	40.61416
8/2/2024	hoary bat	169	carcass search *	70-m cleared	scavenged	-86.84783	40.61434
8/2/2024	hoary bat	169	carcass search *	70-m cleared	scavenged	-86.84719	40.61437
8/3/2024	big brown bat	124	carcass search	100-m road and pad	scavenged	-86.86893	40.70687
8/3/2024	big brown bat	126	carcass search	100-m road and pad	scavenged	-86.87962	40.70842
8/3/2024	big brown bat	153	carcass search	100-m road and pad	scavenged	-86.83742	40.66760
8/3/2024	big brown bat	170	carcass search	70-m cleared	scavenged	-86.84226	40.61420
8/3/2024	big brown bat	170	carcass search	70-m cleared	scavenged	-86.84165	40.61421
8/3/2024	big brown bat	170	carcass search	70-m cleared	scavenged	-86.84224	40.61419
8/3/2024	eastern red bat	123	carcass search	100-m road and pad	scavenged	-86.86242	40.70680
8/3/2024	eastern red bat	151	carcass search	100-m road and pad	scavenged	-86.85016	40.67009

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/3/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84756	40.61441
8/3/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84203	40.61433
8/3/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84175	40.61410
8/3/2024	hoary bat	117	carcass search	100-m road and pad	scavenged	-86.88990	40.72346
8/3/2024	hoary bat	124	carcass search	100-m road and pad	scavenged	-86.86887	40.70692
8/3/2024	hoary bat	150	carcass search	100-m road and pad	intact	-86.84747	40.68206
8/3/2024	eastern red bat	150	carcass search *	100-m road and pad	scavenged	-86.84690	40.68224
8/3/2024	eastern red bat	153	carcass search *	100-m road and pad	dismembered	-86.83724	40.66763
8/3/2024	eastern red bat	170	carcass search *	70-m cleared	scavenged	-86.84200	40.61394
8/3/2024	hoary bat	124	carcass search *	100-m road and pad	scavenged	-86.86899	40.70683
8/5/2024	big brown bat	145	carcass search	70-m cleared	scavenged	-86.89159	40.63704
8/5/2024	big brown bat	148	carcass search	70-m cleared	scavenged	-86.86546	40.68228
8/5/2024	big brown bat	148	carcass search	70-m cleared	scavenged	-86.86491	40.68177
8/5/2024	big brown bat	165	carcass search	70-m cleared	dismembered	-86.86631	40.63000
8/5/2024	big brown bat	169	carcass search	70-m cleared	scavenged	-86.84743	40.61415
8/5/2024	big brown bat	169	carcass search	70-m cleared	scavenged	-86.84803	40.61387
8/5/2024	eastern red bat	143	carcass search	70-m uncleared	scavenged	-86.87908	40.63534
8/5/2024	eastern red bat	144	carcass search	70-m uncleared	scavenged	-86.88589	40.63544
8/5/2024	eastern red bat	145	carcass search	70-m cleared	scavenged	-86.89185	40.63715
8/5/2024	eastern red bat	149	carcass search	70-m uncleared	scavenged	-86.85344	40.68188
8/5/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.83001	40.66294
8/5/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82943	40.66263
8/5/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84175	40.61413
8/5/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84237	40.61403
8/5/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84196	40.61426
8/5/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84237	40.61458
8/5/2024	hoary bat	148	carcass search	70-m cleared	scavenged	-86.86486	40.68214
8/5/2024	hoary bat	148	carcass search	70-m cleared	scavenged	-86.86477	40.68211
8/5/2024	hoary bat	169	carcass search	70-m cleared	scavenged	-86.84767	40.61439
8/5/2024	hoary bat	169	carcass search	70-m cleared	scavenged	-86.84761	40.61449
8/6/2024	big brown bat	111	carcass search	70-m cleared	dismembered	-86.89342	40.74185
8/6/2024	eastern red bat	111	carcass search	70-m cleared	scavenged	-86.89342	40.74276
8/7/2024	big brown bat	103	carcass search	100-m road and pad	scavenged	-86.96407	40.74688
8/7/2024	eastern red bat	106	carcass search	100-m road and pad	intact	-86.94572	40.74241
8/7/2024	eastern red bat	107	carcass search	100-m road and pad	intact	-86.93940	40.74231
8/7/2024	eastern red bat	134	carcass search	100-m road and pad	intact	-86.93366	40.70841

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/7/2024	eastern red bat	156	carcass search	100-m road and pad	scavenged	-86.87936	40.68517
8/7/2024	hoary bat	116	carcass search	100-m road and pad	intact	-86.89666	40.72497
8/7/2024	hoary bat	119	carcass search	100-m road and pad	intact	-86.87712	40.72288
8/7/2024	hoary bat	130	carcass search	100-m road and pad	scavenged	-86.96213	40.70734
8/7/2024	hoary bat	134	carcass search	100-m road and pad	scavenged	-86.93280	40.70859
8/7/2024	hoary bat	136	carcass search	100-m road and pad	intact	-86.91812	40.70867
8/8/2024	big brown bat	111	carcass search	70-m cleared	scavenged	-86.89323	40.74178
8/8/2024	big brown bat	111	carcass search	70-m cleared	scavenged	-86.89326	40.74201
8/8/2024	big brown bat	111	carcass search	70-m cleared	scavenged	-86.89290	40.74222
8/8/2024	big brown bat	120	carcass search	100-m road and pad	scavenged	-86.86293	40.72488
8/8/2024	big brown bat	121	carcass search	100-m road and pad	scavenged	-86.85571	40.72505
8/8/2024	big brown bat	122	carcass search	100-m road and pad	scavenged	-86.85644	40.70680
8/8/2024	big brown bat	124	carcass search	100-m road and pad	scavenged	-86.86908	40.70682
8/8/2024	big brown bat	145	carcass search	70-m cleared	scavenged	-86.89188	40.63663
8/8/2024	big brown bat	162	carcass search	100-m road and pad	scavenged	-86.83067	40.64589
8/8/2024	eastern red bat	123	carcass search	100-m road and pad	scavenged	-86.86253	40.70678
8/8/2024	eastern red bat	144	carcass search	70-m uncleared	scavenged	-86.88566	40.63537
8/8/2024	eastern red bat	159	carcass search	100-m road and pad	intact	-86.85123	40.64410
8/8/2024	eastern red bat	163	carcass search	100-m road and pad	scavenged	-86.82376	40.64510
8/8/2024	eastern red bat	167	carcass search	100-m road and pad	scavenged	-86.85304	40.62940
8/8/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84833	40.61428
8/8/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84737	40.61373
8/8/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84239	40.61430
8/8/2024	eastern red bat	171	carcass search	100-m road and pad	scavenged	-86.83695	40.61433
8/8/2024	eastern red bat	171	carcass search	100-m road and pad	intact	-86.83717	40.61427
8/8/2024	hoary bat	164	carcass search	100-m road and pad	scavenged	-86.81767	40.64492
8/8/2024	hoary bat	168	carcass search	100-m road and pad	intact	-86.85291	40.61411
8/8/2024	hoary bat	170	carcass search	70-m cleared	scavenged	-86.84159	40.61433
8/8/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84711	40.61445
8/8/2024	tricolored bat	170	carcass search	70-m cleared	scavenged	-86.84148	40.61444
8/8/2024	unidentified lasiurus bat	157	carcass search	100-m road and pad	dismembered	-86.84356	40.65714
8/8/2024	unidentified lasiurus bat	169	carcass search	70-m cleared	scavenged	-86.84805	40.61450
8/9/2024	big brown bat	132	carcass search	70-m cleared	scavenged	-86.94622	40.70832
8/9/2024	big brown bat	146	carcass search	100-m road and pad	injured	-86.87758	40.62211
8/9/2024	big brown bat	154	carcass search	70-m uncleared	scavenged	-86.82937	40.66230
8/9/2024	big brown bat	155	carcass search	70-m uncleared	scavenged	-86.82538	40.65967

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/9/2024	big brown bat	160	carcass search	70-m uncleared	scavenged	-86.84484	40.64396
8/9/2024	big brown bat	165	carcass search	70-m cleared	scavenged	-86.86537	40.63049
8/9/2024	big brown bat	165	carcass search	70-m cleared	scavenged	-86.86558	40.63020
8/9/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91116	40.72464
8/9/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94589	40.70882
8/9/2024	eastern red bat	133	carcass search	70-m cleared	scavenged	-86.94010	40.70893
8/9/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82975	40.66294
8/9/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82978	40.66276
8/9/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82999	40.66273
8/9/2024	eastern red bat	160	carcass search	70-m uncleared	scavenged	-86.84510	40.64368
8/9/2024	eastern red bat	165	carcass search	70-m cleared	scavenged	-86.86644	40.63007
8/9/2024	hoary bat	133	carcass search	70-m cleared	scavenged	-86.93990	40.70862
8/9/2024	hoary bat	140	carcass search	100-m road and pad	dismembered	-86.88265	40.65081
8/9/2024	hoary bat	155	carcass search	70-m uncleared	scavenged	-86.82584	40.65959
8/9/2024	hoary bat	155	carcass search	70-m uncleared	scavenged	-86.82536	40.65936
8/9/2024	hoary bat	160	carcass search	70-m uncleared	scavenged	-86.84474	40.64362
8/9/2024	hoary bat	165	carcass search	70-m cleared	scavenged	-86.86629	40.63003
8/10/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86573	40.68197
8/10/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86465	40.68185
8/10/2024	hoary bat	148	carcass search	70-m cleared	intact	-86.86481	40.68237
8/12/2024	big brown bat	104	carcass search	100-m road and pad	dismembered	-86.95772	40.74759
8/12/2024	big brown bat	111	carcass search	70-m cleared	scavenged	-86.89307	40.74250
8/12/2024	eastern red bat	144	carcass search	70-m uncleared	scavenged	-86.88580	40.63486
8/12/2024	hoary bat	111	carcass search	70-m cleared	scavenged	-86.89297	40.74192
8/12/2024	hoary bat	143	carcass search	70-m uncleared	scavenged	-86.87873	40.63516
8/12/2024	hoary bat	169	carcass search	70-m cleared	scavenged	-86.84762	40.61455
8/13/2024	eastern red bat	162	carcass search	100-m road and pad	dismembered	-86.83050	40.64598
8/13/2024	eastern red bat	171	carcass search	100-m road and pad	dismembered	-86.83693	40.61414
8/13/2024	hoary bat	146	carcass search	100-m road and pad	dismembered	-86.87716	40.62197
8/14/2024	big brown bat	109	carcass search	70-m uncleared	scavenged	-86.91130	40.74317
8/14/2024	big brown bat	131	carcass search	70-m uncleared	scavenged	-86.95308	40.70980
8/14/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91125	40.72491
8/14/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82969	40.66267
8/14/2024	eastern red bat	155	carcass search	70-m uncleared	scavenged	-86.82532	40.65950
8/14/2024	eastern red bat	155	carcass search	70-m uncleared	dismembered	-86.82565	40.65985
8/14/2024	eastern red bat	165	carcass search	70-m cleared	dismembered	-86.86566	40.63010

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/15/2024	big brown bat	165	carcass search	70-m cleared	intact	-86.86576	40.63020
8/15/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84793	40.61416
8/15/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84790	40.61421
8/15/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84802	40.61401
8/15/2024	evening bat	148	carcass search	70-m cleared	scavenged	-86.86483	40.68197
8/15/2024	hoary bat	143	carcass search	70-m uncleared	intact	-86.87973	40.63561
8/15/2024	hoary bat	144	carcass search	70-m uncleared	intact	-86.88569	40.63545
8/15/2024	hoary bat	160	carcass search	70-m uncleared	scavenged	-86.84432	40.64409
8/16/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94618	40.70893
8/16/2024	eastern red bat	133	carcass search	70-m cleared	intact	-86.94027	40.70908
8/19/2024	big brown bat	145	carcass search	70-m cleared	scavenged	-86.89221	40.63706
8/19/2024	big brown bat	160	carcass search	70-m uncleared	dismembered	-86.84500	40.64394
8/19/2024	big brown bat	169	carcass search	70-m cleared	scavenged	-86.84762	40.61471
8/19/2024	eastern red bat	105	carcass search	100-m road and pad	scavenged	-86.95114	40.74344
8/19/2024	eastern red bat	106	carcass search	100-m road and pad	scavenged	-86.94558	40.74244
8/19/2024	eastern red bat	144	carcass search	70-m uncleared	scavenged	-86.88538	40.63505
8/19/2024	eastern red bat	145	carcass search	70-m cleared	scavenged	-86.89222	40.63756
8/19/2024	eastern red bat	145	carcass search	70-m cleared	scavenged	-86.89205	40.63728
8/19/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86497	40.68170
8/19/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86534	40.68163
8/19/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86549	40.68225
8/19/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86527	40.68251
8/19/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82939	40.66301
8/19/2024	eastern red bat	155	carcass search	70-m uncleared	scavenged	-86.82549	40.65946
8/19/2024	eastern red bat	160	carcass search	70-m uncleared	scavenged	-86.84478	40.64427
8/19/2024	eastern red bat	165	carcass search	70-m cleared	intact	-86.86575	40.62974
8/19/2024	eastern red bat	168	carcass search	100-m road and pad	scavenged	-86.85333	40.61412
8/19/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84799	40.61419
8/19/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84783	40.61414
8/19/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84188	40.61372
8/19/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84212	40.61449
8/19/2024	eastern red bat	144	carcass search **	70-m uncleared	scavenged	-86.88493	40.63515
8/19/2024	hoary bat	106	carcass search	100-m road and pad	intact	-86.94523	40.74227
8/19/2024	silver-haired bat	145	carcass search	70-m cleared	scavenged	-86.89191	40.63715
8/20/2024	big brown bat	133	carcass search	70-m cleared	intact	-86.93987	40.70848
8/20/2024	big brown bat	171	carcass search	100-m road and pad	dismembered	-86.83685	40.61434

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/20/2024	eastern red bat	133	carcass search	70-m cleared	scavenged	-86.93993	40.70877
8/20/2024	eastern red bat	133	carcass search	70-m cleared	intact	-86.94002	40.70831
8/20/2024	eastern red bat	147	carcass search	100-m road and pad	scavenged	-86.87340	40.68207
8/20/2024	eastern red bat or Seminole bat	111	carcass search	70-m cleared	scavenged	-86.89327	40.74219
8/20/2024	hoary bat	111	carcass search	70-m cleared	scavenged	-86.89302	40.74263
8/20/2024	hoary bat	132	carcass search	70-m cleared	scavenged	-86.94634	40.70880
8/20/2024	silver-haired bat	131	carcass search	70-m uncleared	dismembered	-86.95241	40.71002
8/20/2024	silver-haired bat	132	carcass search	70-m cleared	intact	-86.94636	40.70850
8/20/2024	silver-haired bat	172	carcass search	100-m road and pad	scavenged	-86.83209	40.61234
8/20/2024	silver-haired bat	172	carcass search	100-m road and pad	scavenged	-86.83264	40.61236
8/22/2024	big brown bat	165	carcass search	70-m cleared	dismembered	-86.86586	40.63024
8/22/2024	eastern red bat	123	carcass search	100-m road and pad	scavenged	-86.86227	40.70675
8/22/2024	eastern red bat	152	carcass search	100-m road and pad	dismembered	-86.84396	40.66985
8/22/2024	eastern red bat	154	carcass search	70-m uncleared	intact	-86.82931	40.66243
8/22/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82946	40.66291
8/22/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82945	40.66262
8/22/2024	eastern red bat	155	carcass search	70-m uncleared	scavenged	-86.82499	40.65997
8/22/2024	eastern red bat	158	carcass search	100-m road and pad	scavenged	-86.85760	40.64506
8/22/2024	eastern red bat	160	carcass search	70-m uncleared	injured	-86.84436	40.64362
8/22/2024	eastern red bat	161	carcass search	100-m road and pad	scavenged	-86.83602	40.64505
8/22/2024	eastern red bat	165	carcass search	70-m cleared	intact	-86.86512	40.62993
8/22/2024	eastern red bat	167	carcass search	100-m road and pad	scavenged	-86.85297	40.62938
8/22/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84214	40.61408
8/22/2024	hoary bat	154	carcass search	70-m uncleared	intact	-86.82919	40.66273
8/22/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88574	40.63480
8/22/2024	silver-haired bat	148	carcass search	70-m cleared	intact	-86.86515	40.68195
8/23/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91133	40.72470
8/23/2024	eastern red bat	131	carcass search	70-m uncleared	scavenged	-86.95283	40.70969
8/23/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89396	40.74195
8/23/2024	silver-haired bat	132	carcass search	70-m cleared	intact	-86.94580	40.70853
8/23/2024	unidentified non-myotis	132	carcass search	70-m cleared	dismembered	-86.94635	40.70878
8/26/2024	big brown bat	143	carcass search	70-m uncleared	scavenged	-86.87927	40.63546
8/26/2024	big brown bat	143	carcass search	70-m uncleared	scavenged	-86.87903	40.63542
8/26/2024	big brown bat	169	carcass search	70-m cleared	scavenged	-86.84792	40.61439
8/26/2024	big brown bat	170	carcass search	70-m cleared	scavenged	-86.84217	40.61431
8/26/2024	eastern red bat	143	carcass search	70-m uncleared	scavenged	-86.87974	40.63537

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Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/26/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86555	40.68213
8/26/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86558	40.68247
8/26/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84765	40.61429
8/26/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84809	40.61433
8/26/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84195	40.61402
8/26/2024	silver-haired bat	138	carcass search	70-m cleared	scavenged	-86.89067	40.70199
8/26/2024	silver-haired bat	145	carcass search	70-m cleared	scavenged	-86.89230	40.63736
8/26/2024	silver-haired bat	170	carcass search	70-m cleared	scavenged	-86.84207	40.61447
8/27/2024	big brown bat	103	carcass search	100-m road and pad	scavenged	-86.96379	40.74700
8/27/2024	big brown bat	105	carcass search	100-m road and pad	scavenged	-86.95078	40.74345
8/27/2024	big brown bat	108	carcass search	100-m road and pad	intact	-86.93297	40.74305
8/27/2024	big brown bat	127	carcass search	100-m road and pad	scavenged	-86.90395	40.70364
8/27/2024	big brown bat	137	carcass search	100-m road and pad	scavenged	-86.91072	40.70866
8/27/2024	eastern red bat	105	carcass search	100-m road and pad	scavenged	-86.95044	40.74344
8/27/2024	eastern red bat	106	carcass search	100-m road and pad	scavenged	-86.94578	40.74230
8/27/2024	eastern red bat	111	carcass search	70-m cleared	intact	-86.89338	40.74215
8/27/2024	eastern red bat	114	carcass search	70-m uncleared	intact	-86.91154	40.72506
8/27/2024	eastern red bat	132	carcass search	70-m cleared	intact	-86.94607	40.70868
8/27/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94557	40.70907
8/27/2024	eastern red bat	133	carcass search	70-m cleared	scavenged	-86.94017	40.70867
8/27/2024	hoary bat	111	carcass search	70-m cleared	intact	-86.89321	40.74239
8/27/2024	silver-haired bat	102	carcass search	100-m road and pad	scavenged	-86.97288	40.74698
8/27/2024	silver-haired bat	105	carcass search	100-m road and pad	scavenged	-86.95109	40.74340
8/27/2024	silver-haired bat	108	carcass search	100-m road and pad	scavenged	-86.93305	40.74295
8/27/2024	silver-haired bat	131	carcass search	70-m uncleared	intact	-86.95229	40.70944
8/28/2024	big brown bat	162	carcass search	100-m road and pad	scavenged	-86.83043	40.64516
8/28/2024	big brown bat	168	carcass search	100-m road and pad	intact	-86.85310	40.61422
8/28/2024	big brown bat	172	carcass search	100-m road and pad	scavenged	-86.83217	40.61255
8/28/2024	eastern red bat	120	carcass search	100-m road and pad	scavenged	-86.86289	40.72490
8/28/2024	eastern red bat	121	carcass search	100-m road and pad	scavenged	-86.85588	40.72499
8/28/2024	eastern red bat	124	carcass search	100-m road and pad	scavenged	-86.86888	40.70689
8/28/2024	eastern red bat	124	carcass search	100-m road and pad	scavenged	-86.86887	40.70675
8/28/2024	eastern red bat	157	carcass search	100-m road and pad	scavenged	-86.84366	40.65713
8/28/2024	hoary bat	150	carcass search	100-m road and pad	scavenged	-86.84721	40.68205
8/28/2024	hoary bat	167	carcass search	100-m road and pad	scavenged	-86.85295	40.62996
8/28/2024	silver-haired bat	124	carcass search	100-m road and pad	scavenged	-86.86900	40.70718

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/28/2024	silver-haired bat	125	carcass search	100-m road and pad	scavenged	-86.87443	40.70688
8/28/2024	silver-haired bat	162	carcass search	100-m road and pad	scavenged	-86.83068	40.64607
8/28/2024	unidentified lasiurus bat	168	carcass search	100-m road and pad	dismembered	-86.85325	40.61419
8/29/2024	big brown bat	154	carcass search	70-m uncleared	scavenged	-86.82939	40.66276
8/29/2024	big brown bat	170	carcass search	70-m cleared	scavenged	-86.84256	40.61450
8/29/2024	eastern red bat	144	carcass search	70-m uncleared	scavenged	-86.88541	40.63526
8/29/2024	eastern red bat	160	carcass search	70-m uncleared	scavenged	-86.84455	40.64403
8/29/2024	eastern red bat	165	carcass search	70-m cleared	intact	-86.86554	40.63028
8/29/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84804	40.61433
8/29/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84754	40.61445
8/29/2024	hoary bat	148	carcass search	70-m cleared	intact	-86.86507	40.68210
8/29/2024	hoary bat	155	carcass search	70-m uncleared	scavenged	-86.82521	40.65979
8/29/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82564	40.65971
8/30/2024	big brown bat	111	carcass search	70-m cleared	scavenged	-86.89322	40.74259
8/30/2024	big brown bat	111	carcass search	70-m cleared	scavenged	-86.89346	40.74249
8/30/2024	big brown bat	133	carcass search	70-m cleared	scavenged	-86.93983	40.70916
8/30/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94610	40.70884
8/30/2024	silver-haired bat	133	carcass search	70-m cleared	scavenged	-86.94015	40.70863
9/2/2024	big brown bat	148	carcass search	70-m cleared	scavenged	-86.86571	40.68203
9/2/2024	big brown bat	160	carcass search	70-m uncleared	dismembered	-86.84444	40.64376
9/2/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82959	40.66322
9/2/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82943	40.66294
9/2/2024	eastern red bat or Seminole bat	154	carcass search	70-m uncleared	scavenged	-86.82962	40.66255
9/2/2024	hoary bat	145	carcass search	70-m cleared	scavenged	-86.89167	40.63672
9/2/2024	hoary bat	148	carcass search	70-m cleared	intact	-86.86458	40.68216
9/2/2024	hoary bat	149	carcass search	70-m uncleared	intact	-86.85346	40.68231
9/2/2024	hoary bat	165	carcass search	70-m cleared	intact	-86.86508	40.63009
9/2/2024	silver-haired bat	148	carcass search	70-m cleared	dismembered	-86.86556	40.68189
9/2/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82934	40.66257
9/2/2024	silver-haired bat	165	carcass search	70-m cleared	intact	-86.86511	40.63012
9/2/2024	unidentified lasiurus bat	145	carcass search	70-m cleared	scavenged	-86.89225	40.63751
9/3/2024	big brown bat	132	carcass search	70-m cleared	scavenged	-86.94606	40.70896
9/3/2024	eastern red bat	113	carcass search	100-m road and pad	intact	-86.91425	40.72990
9/3/2024	eastern red bat	118	carcass search	100-m road and pad	dismembered	-86.88308	40.72362
9/3/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94625	40.70849
9/3/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94605	40.70897

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/3/2024	hoary bat	105	carcass search	100-m road and pad	scavenged	-86.95117	40.74343
9/3/2024	hoary bat	112	carcass search	100-m road and pad	scavenged	-86.92098	40.73099
9/3/2024	hoary bat	112	carcass search	100-m road and pad	scavenged	-86.92098	40.73117
9/3/2024	hoary bat	132	carcass search	70-m cleared	scavenged	-86.94598	40.70908
9/3/2024	hoary bat	133	carcass search	70-m cleared	scavenged	-86.93936	40.70844
9/3/2024	silver-haired bat	131	carcass search	70-m uncleared	intact	-86.95231	40.70969
9/3/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94604	40.70856
9/4/2024	eastern red bat	101	carcass search	100-m road and pad	scavenged	-86.97790	40.74735
9/4/2024	eastern red bat	124	carcass search	100-m road and pad	dismembered	-86.86872	40.70696
9/4/2024	hoary bat	101	carcass search	100-m road and pad	scavenged	-86.97783	40.74710
9/4/2024	silver-haired bat	123	carcass search	100-m road and pad	scavenged	-86.86246	40.70680
9/5/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86525	40.68168
9/5/2024	eastern red bat	149	carcass search	70-m uncleared	scavenged	-86.85357	40.68222
9/5/2024	eastern red bat	155	carcass search	70-m uncleared	scavenged	-86.82579	40.65951
9/5/2024	eastern red bat or Seminole bat	160	carcass search	70-m uncleared	scavenged	-86.84502	40.64373
9/5/2024	hoary bat	138	carcass search	70-m cleared	intact	-86.89159	40.70224
9/5/2024	hoary bat	148	carcass search	70-m cleared	scavenged	-86.86473	40.68243
9/5/2024	hoary bat	154	carcass search	70-m uncleared	scavenged	-86.82924	40.66277
9/5/2024	hoary bat	154	carcass search	70-m uncleared	scavenged	-86.82959	40.66258
9/5/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88549	40.63482
9/5/2024	silver-haired bat	145	carcass search	70-m cleared	scavenged	-86.89183	40.63710
9/5/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82912	40.66232
9/6/2024	big brown bat	132	carcass search	70-m cleared	scavenged	-86.94598	40.70903
9/9/2024	big brown bat	145	carcass search	70-m cleared	scavenged	-86.89164	40.63729
9/9/2024	eastern red bat	165	carcass search	70-m cleared	scavenged	-86.86605	40.62969
9/9/2024	eastern red bat	165	carcass search	70-m cleared	scavenged	-86.86628	40.63034
9/9/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87905	40.63541
9/9/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88509	40.63523
9/9/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82893	40.66313
9/9/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82985	40.66265
9/9/2024	silver-haired bat	165	carcass search	70-m cleared	scavenged	-86.86568	40.63055
9/9/2024	silver-haired bat	165	carcass search	70-m cleared	scavenged	-86.86581	40.63003
9/10/2024	big brown bat	106	carcass search	100-m road and pad	scavenged	-86.94542	40.74231
9/10/2024	big brown bat	154	carcass search	70-m uncleared	scavenged	-86.83016	40.66297
9/10/2024	eastern red bat	110	carcass search	100-m road and pad	intact	-86.89948	40.74220
9/10/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86535	40.68260

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/10/2024	hoary bat	155	carcass search	70-m uncleared	scavenged	-86.82529	40.65926
9/10/2024	silver-haired bat	117	carcass search	100-m road and pad	scavenged	-86.89025	40.72339
9/10/2024	silver-haired bat	139	carcass search	100-m road and pad	injured	-86.88120	40.67072
9/10/2024	silver-haired bat	147	carcass search	100-m road and pad	scavenged	-86.87320	40.68221
9/10/2024	silver-haired bat	149	carcass search	70-m uncleared	scavenged	-86.85338	40.68209
9/10/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82938	40.66248
9/11/2024	eastern red bat	132	carcass search	70-m cleared	scavenged	-86.94662	40.70829
9/11/2024	hoary bat	111	carcass search	70-m cleared	dismembered	-86.89326	40.74237
9/11/2024	hoary bat	151	carcass search	100-m road and pad	scavenged	-86.85008	40.66991
9/11/2024	silver-haired bat	111	carcass search	70-m cleared	dismembered	-86.89329	40.74201
9/11/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89325	40.74259
9/11/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89344	40.74177
9/11/2024	silver-haired bat	114	carcass search	70-m uncleared	intact	-86.91168	40.72507
9/11/2024	silver-haired bat	150	carcass search	100-m road and pad	scavenged	-86.84740	40.68205
9/11/2024	silver-haired bat	167	carcass search	100-m road and pad	scavenged	-86.85319	40.62946
9/11/2024	silver-haired bat	168	carcass search	100-m road and pad	scavenged	-86.85323	40.61414
9/12/2024	big brown bat	169	carcass search	70-m cleared	scavenged	-86.84779	40.61492
9/12/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86558	40.68212
9/12/2024	eastern red bat	155	carcass search	70-m uncleared	scavenged	-86.82487	40.65932
9/12/2024	eastern red bat	165	carcass search	70-m cleared	scavenged	-86.86513	40.63010
9/12/2024	eastern red bat or Seminole bat	155	carcass search	70-m uncleared	scavenged	-86.82544	40.65956
9/12/2024	hoary bat	144	carcass search	70-m uncleared	scavenged	-86.88616	40.63545
9/12/2024	silver-haired bat	145	carcass search	70-m cleared	scavenged	-86.89249	40.63696
9/12/2024	silver-haired bat	160	carcass search	70-m uncleared	scavenged	-86.84492	40.64424
9/12/2024	silver-haired bat	165	carcass search	70-m cleared	dismembered	-86.86551	40.63063
9/12/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84825	40.61435
9/12/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84842	40.61427
9/12/2024	unidentified non-myotis	155	carcass search	70-m uncleared	dismembered	-86.82529	40.65932
9/13/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91193	40.72451
9/13/2024	eastern red bat	114	carcass search	70-m uncleared	intact	-86.91179	40.72467
9/13/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82892	40.66311
9/13/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82944	40.66275
9/13/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82951	40.66258
9/13/2024	silver-haired bat	170	carcass search	70-m cleared	scavenged	-86.84227	40.61464
9/13/2024	silver-haired bat	170	carcass search	70-m cleared	scavenged	-86.84228	40.61483
9/16/2024	big brown bat	148	carcass search	70-m cleared	scavenged	-86.86561	40.68193

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/16/2024	big brown bat	149	carcass search	70-m uncleared	dismembered	-86.85348	40.68223
9/16/2024	big brown bat	149	carcass search	70-m uncleared	scavenged	-86.85378	40.68166
9/16/2024	big brown bat	169	carcass search	70-m cleared	scavenged	-86.84797	40.61463
9/16/2024	eastern red bat	143	carcass search	70-m uncleared	scavenged	-86.87936	40.63551
9/16/2024	eastern red bat or Seminole bat	148	carcass search	70-m cleared	dismembered	-86.86587	40.68229
9/16/2024	hoary bat	138	carcass search	70-m cleared	intact	-86.89120	40.70230
9/16/2024	hoary bat	148	carcass search	70-m cleared	scavenged	-86.86535	40.68177
9/16/2024	hoary bat	160	carcass search	70-m uncleared	intact	-86.84466	40.64396
9/16/2024	hoary bat	160	carcass search	70-m uncleared	scavenged	-86.84497	40.6438
9/16/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87969	40.63502
9/16/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87963	40.63486
9/16/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87990	40.63506
9/16/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88597	40.63512
9/16/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88626	40.63504
9/16/2024	silver-haired bat	148	carcass search	70-m cleared	scavenged	-86.86544	40.68241
9/16/2024	silver-haired bat	148	carcass search	70-m cleared	scavenged	-86.86564	40.68178
9/16/2024	silver-haired bat	149	carcass search	70-m uncleared	scavenged	-86.85372	40.68194
9/16/2024	silver-haired bat	149	carcass search	70-m uncleared	scavenged	-86.85390	40.68184
9/16/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82592	40.65980
9/16/2024	silver-haired bat	155	carcass search	70-m uncleared	intact	-86.82587	40.65923
9/16/2024	silver-haired bat	160	carcass search	70-m uncleared	scavenged	-86.84433	40.64384
9/16/2024	silver-haired bat	165	carcass search	70-m cleared	scavenged	-86.86615	40.63004
9/17/2024	big brown bat	105	carcass search	100-m road and pad	scavenged	-86.95124	40.74333
9/17/2024	big brown bat	116	carcass search	100-m road and pad	intact	-86.89628	40.72500
9/17/2024	big brown bat	118	carcass search	100-m road and pad	dismembered	-86.88283	40.72383
9/17/2024	eastern red bat	135	carcass search	70-m cleared	scavenged	-86.92477	40.70863
9/17/2024	hoary bat	129	carcass search	100-m road and pad	scavenged	-86.96743	40.70721
9/17/2024	silver-haired bat	110	carcass search	100-m road and pad	scavenged	-86.89924	40.74237
9/17/2024	silver-haired bat	129	carcass search	100-m road and pad	scavenged	-86.96755	40.70712
9/17/2024	silver-haired bat	131	carcass search	70-m uncleared	scavenged	-86.95277	40.70946
9/17/2024	silver-haired bat	131	carcass search	70-m uncleared	scavenged	-86.95273	40.70943
9/17/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94636	40.70871
9/18/2024	big brown bat	114	carcass search	70-m uncleared	intact	-86.91155	40.72470
9/18/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91153	40.72466
9/18/2024	silver-haired bat	101	carcass search	100-m road and pad	intact	-86.97781	40.74710
9/18/2024	silver-haired bat	114	carcass search	70-m uncleared	intact	-86.91167	40.72465

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/19/2024	big brown bat	148	carcass search	70-m cleared	scavenged	-86.86523	40.68204
9/19/2024	big brown bat	149	carcass search	70-m uncleared	scavenged	-86.85352	40.68214
9/19/2024	big brown bat	154	carcass search	70-m uncleared	scavenged	-86.82985	40.66259
9/19/2024	big brown bat	154	carcass search	70-m uncleared	dismembered	-86.82942	40.66238
9/19/2024	eastern red bat	149	carcass search	70-m uncleared	scavenged	-86.85372	40.68233
9/19/2024	hoary bat	160	carcass search	70-m uncleared	scavenged	-86.84489	40.64372
9/19/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87963	40.63555
9/19/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.8798	40.63549
9/19/2024	silver-haired bat	148	carcass search	70-m cleared	scavenged	-86.86582	40.68178
9/19/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82986	40.66287
9/19/2024	silver-haired bat	160	carcass search	70-m uncleared	scavenged	-86.84513	40.64426
9/19/2024	silver-haired bat	165	carcass search	70-m cleared	scavenged	-86.86570	40.63007
9/19/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84812	40.61468
9/20/2024	big brown bat	109	carcass search	70-m uncleared	dismembered	-86.91092	40.74321
9/20/2024	big brown bat	114	carcass search	70-m uncleared	intact	-86.91136	40.72481
9/20/2024	silver-haired bat	109	carcass search	70-m uncleared	intact	-86.91108	40.74324
9/20/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89369	40.74231
9/20/2024	silver-haired bat	133	carcass search	70-m cleared	scavenged	-86.94020	40.70889
9/21/2024	big brown bat	122	carcass search	100-m road and pad	scavenged	-86.85603	40.70683
9/21/2024	big brown bat	123	carcass search	100-m road and pad	intact	-86.86267	40.70676
9/21/2024	big brown bat	151	carcass search	100-m road and pad	scavenged	-86.85007	40.67026
9/21/2024	big brown bat	152	carcass search	100-m road and pad	scavenged	-86.84412	40.67021
9/21/2024	eastern red bat	123	carcass search	100-m road and pad	intact	-86.86267	40.70673
9/21/2024	eastern red bat	125	carcass search	100-m road and pad	scavenged	-86.87441	40.70673
9/21/2024	hoary bat	126	carcass search	100-m road and pad	scavenged	-86.87949	40.70827
9/21/2024	hoary bat	151	carcass search	100-m road and pad	scavenged	-86.8501	40.67009
9/21/2024	silver-haired bat	123	carcass search	100-m road and pad	scavenged	-86.86248	40.70683
9/21/2024	silver-haired bat	140	carcass search	100-m road and pad	scavenged	-86.88248	40.65071
9/21/2024	silver-haired bat	141	carcass search	100-m road and pad	scavenged	-86.88869	40.65080
9/21/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82573	40.65956
9/21/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82546	40.65955
9/21/2024	silver-haired bat	164	carcass search	100-m road and pad	scavenged	-86.81761	40.64506
9/23/2024	eastern red bat	145	carcass search	70-m cleared	scavenged	-86.89204	40.63682
9/23/2024	eastern red bat	148	carcass search	70-m cleared	scavenged	-86.86558	40.68241
9/23/2024	eastern red bat	160	carcass search	70-m uncleared	intact	-86.84436	40.64398
9/23/2024	silver-haired bat	138	carcass search	70-m cleared	scavenged	-86.89112	40.70280

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/23/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88550	40.63514
9/23/2024	silver-haired bat	149	carcass search	70-m uncleared	dismembered	-86.85410	40.68249
9/23/2024	silver-haired bat	160	carcass search	70-m uncleared	intact	-86.84437	40.64405
9/23/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84816	40.61469
9/24/2024	big brown bat	132	carcass search	70-m cleared	scavenged	-86.94663	40.70866
9/24/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94643	40.70870
9/25/2024	eastern red bat or Seminole bat	168	carcass search	100-m road and pad	scavenged	-86.85295	40.61428
9/25/2024	silver-haired bat	130	carcass search	100-m road and pad	scavenged	-86.96225	40.70731
9/25/2024	silver-haired bat	153	carcass search	100-m road and pad	scavenged	-86.83726	40.66763
9/25/2024	silver-haired bat	157	carcass search	100-m road and pad	scavenged	-86.84398	40.65714
9/25/2024	silver-haired bat	161	carcass search	100-m road and pad	scavenged	-86.83578	40.64527
9/25/2024	silver-haired bat	161	carcass search	100-m road and pad	scavenged	-86.83594	40.64525
9/26/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84706	40.61394
9/26/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84197	40.61459
9/26/2024	hoary bat	145	carcass search	70-m cleared	scavenged	-86.89170	40.63707
9/26/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87923	40.63498
9/26/2024	silver-haired bat	144	carcass search	70-m uncleared	scavenged	-86.88517	40.63487
9/26/2024	silver-haired bat	148	carcass search	70-m cleared	scavenged	-86.86544	40.68185
9/26/2024	silver-haired bat	148	carcass search	70-m cleared	dismembered	-86.86564	40.68222
9/26/2024	unidentified lasiurus bat	165	carcass search	70-m cleared	dismembered	-86.86494	40.63045
9/27/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89365	40.74227
9/27/2024	silver-haired bat	111	carcass search	70-m cleared	dismembered	-86.89375	40.74230
9/27/2024	silver-haired bat	131	carcass search	70-m uncleared	scavenged	-86.95269	40.70952
9/27/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94589	40.70858
9/28/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91220	40.72478
9/28/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91141	40.72490
9/28/2024	hoary bat	114	carcass search	70-m uncleared	scavenged	-86.91150	40.72531
9/30/2024	big brown bat	148	carcass search	70-m cleared	injured	-86.86579	40.68193
9/30/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84722	40.61379
9/30/2024	hoary bat	148	carcass search	70-m cleared	scavenged	-86.86517	40.68226
9/30/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87942	40.63515
9/30/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84791	40.61415
9/30/2024	silver-haired bat	170	carcass search	70-m cleared	scavenged	-86.84206	40.61432
10/1/2024	eastern red bat	111	carcass search	70-m cleared	scavenged	-86.89351	40.74159
10/1/2024	eastern red bat	132	carcass search	70-m cleared	intact	-86.94608	40.70867
10/1/2024	eastern red bat	156	carcass search	100-m road and pad	scavenged	-86.87905	40.68498

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
10/1/2024	silver-haired bat	106	carcass search	100-m road and pad	intact	-86.94574	40.74221
10/1/2024	silver-haired bat	108	carcass search	100-m road and pad	intact	-86.93290	40.74295
10/1/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89372	40.74257
10/1/2024	silver-haired bat	113	carcass search	100-m road and pad	scavenged	-86.91449	40.73017
10/1/2024	silver-haired bat	113	carcass search	100-m road and pad	scavenged	-86.91448	40.73036
10/1/2024	silver-haired bat	127	carcass search	100-m road and pad	intact	-86.90424	40.70359
10/1/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94563	40.70842
10/2/2024	eastern red bat	114	carcass search	70-m uncleared	scavenged	-86.91152	40.72514
10/2/2024	eastern red bat	131	carcass search	70-m uncleared	intact	-86.95258	40.70946
10/2/2024	eastern red bat	161	carcass search	100-m road and pad	intact	-86.83642	40.64494
10/2/2024	eastern red bat	164	carcass search	100-m road and pad	scavenged	-86.81759	40.64462
10/2/2024	eastern red bat	164	carcass search	100-m road and pad	scavenged	-86.81751	40.64451
10/2/2024	silver-haired bat	109	carcass search	70-m uncleared	scavenged	-86.91134	40.74279
10/2/2024	silver-haired bat	114	carcass search	70-m uncleared	scavenged	-86.91142	40.72491
10/2/2024	silver-haired bat	124	carcass search	100-m road and pad	scavenged	-86.86898	40.70682
10/2/2024	silver-haired bat	131	carcass search	70-m uncleared	scavenged	-86.95235	40.70929
10/2/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82539	40.65942
10/2/2024	silver-haired bat	159	carcass search	100-m road and pad	scavenged	-86.85069	40.64396
10/2/2024	silver-haired bat	166	carcass search	100-m road and pad	scavenged	-86.85905	40.63002
10/3/2024	eastern red bat	149	carcass search	70-m uncleared	scavenged	-86.85402	40.68224
10/3/2024	silver-haired bat	134	carcass search	100-m road and pad	scavenged	-86.93328	40.70847
10/3/2024	silver-haired bat	149	carcass search	70-m uncleared	scavenged	-86.85403	40.68192
10/3/2024	silver-haired bat	160	carcass search **	70-m uncleared	scavenged	-86.84416	40.64330
10/4/2024	silver-haired bat	131	carcass search	70-m uncleared	scavenged	-86.95297	40.70944
10/4/2024	silver-haired bat	133	carcass search	70-m cleared	scavenged	-86.93992	40.70862
10/5/2024	eastern red bat	114	carcass search	70-m uncleared	intact	-86.91139	40.72498
10/7/2024	eastern red bat	106	carcass search	100-m road and pad	intact	-86.94501	40.74225
10/7/2024	eastern red bat	119	carcass search	100-m road and pad	scavenged	-86.87617	40.72253
10/7/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84761	40.61492
10/7/2024	eastern red bat	170	carcass search	70-m cleared	scavenged	-86.84217	40.61428
10/7/2024	silver-haired bat	104	carcass search	100-m road and pad	scavenged	-86.95770	40.74818
10/7/2024	silver-haired bat	105	carcass search	100-m road and pad	scavenged	-86.95123	40.74339
10/7/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94631	40.70856
10/7/2024	silver-haired bat	132	carcass search	70-m cleared	scavenged	-86.94590	40.70863
10/7/2024	silver-haired bat	138	carcass search	70-m cleared	intact	-86.89068	40.70247
10/7/2024	silver-haired bat	148	carcass search	70-m cleared	intact	-86.86542	40.68167

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Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
10/7/2024	silver-haired bat	165	carcass search	70-m cleared	scavenged	-86.86616	40.63038
10/7/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84747	40.61391
10/7/2024	silver-haired bat	169	carcass search	70-m cleared	scavenged	-86.84720	40.61434
10/7/2024	silver-haired bat	170	carcass search	70-m cleared	scavenged	-86.84211	40.61447
10/8/2024	eastern red bat	115	carcass search	100-m road and pad	scavenged	-86.90375	40.72483
10/8/2024	eastern red bat	131	carcass search	70-m uncleared	scavenged	-86.95246	40.71010
10/8/2024	eastern red bat	131	carcass search	70-m uncleared	intact	-86.95252	40.70954
10/8/2024	eastern red bat	141	carcass search	100-m road and pad	scavenged	-86.88862	40.65081
10/8/2024	eastern red bat	155	carcass search	70-m uncleared	dismembered	-86.82611	40.65978
10/8/2024	silver-haired bat	122	carcass search	100-m road and pad	scavenged	-86.85632	40.70695
10/8/2024	silver-haired bat	131	carcass search	70-m uncleared	intact	-86.95260	40.70942
10/8/2024	silver-haired bat	151	carcass search	100-m road and pad	scavenged	-86.84991	40.67019
10/8/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82914	40.66258
10/8/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82931	40.66219
10/8/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82545	40.65994
10/8/2024	silver-haired bat	155	carcass search	70-m uncleared	scavenged	-86.82558	40.65922
10/8/2024	silver-haired bat	159	carcass search	100-m road and pad	scavenged	-86.85062	40.64412
10/8/2024	silver-haired bat	155	carcass search **	70-m uncleared	scavenged	-86.82493	40.66029
10/10/2024	eastern red bat	149	carcass search	70-m uncleared	dismembered	-86.85361	40.68255
10/10/2024	eastern red bat	154	carcass search	70-m uncleared	scavenged	-86.82985	40.66281
10/10/2024	eastern red bat	169	carcass search	70-m cleared	scavenged	-86.84809	40.61433
10/10/2024	silver-haired bat	138	carcass search	70-m cleared	scavenged	-86.89123	40.70304
10/10/2024	silver-haired bat	138	carcass search	70-m cleared	scavenged	-86.89114	40.70198
10/10/2024	silver-haired bat	138	carcass search	70-m cleared	scavenged	-86.89088	40.70297
10/10/2024	silver-haired bat	143	carcass search	70-m uncleared	scavenged	-86.87941	40.63551
10/10/2024	silver-haired bat	149	carcass search	70-m uncleared	scavenged	-86.85349	40.68154
10/10/2024	silver-haired bat	154	carcass search	70-m uncleared	scavenged	-86.82881	40.66286
10/11/2024	silver-haired bat	111	carcass search	70-m cleared	intact	-86.89328	40.74216
10/11/2024	silver-haired bat	131	carcass search	70-m uncleared	scavenged	-86.95302	40.70941
10/14/2024	eastern red bat	108	carcass search	100-m road and pad	intact	-86.93261	40.74287
10/14/2024	eastern red bat	130	carcass search	100-m road and pad	intact	-86.96182	40.70743
10/14/2024	eastern red bat	165	carcass search	70-m cleared	scavenged	-86.86572	40.63018
10/14/2024	silver-haired bat	106	carcass search	100-m road and pad	scavenged	-86.94543	40.74241
10/15/2024	eastern red bat	166	carcass search **	100-m road and pad	scavenged	-86.85925	40.63025
10/15/2024	silver-haired bat	111	carcass search	70-m cleared	scavenged	-86.89274	40.74244

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Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
Bird Carcasses							
4/1/2024	red-tailed hawk	121	carcass search	100-m road and pad	intact	-86.85627	40.72500
4/10/2024	Canada goose	105	carcass search	100-m road and pad	dismembered	-86.95041	40.74419
4/12/2024	golden-crowned kinglet	142	carcass search	100-m road and pad	scavenged	-86.87356	40.64477
4/16/2024	unidentified sparrow	120	carcass search	100-m road and pad	scavenged	-86.86294	40.72493
4/17/2024	brown-headed cowbird	129	carcass search	100-m road and pad	intact	-86.96739	40.70722
4/17/2024	northern flicker	129	carcass search	100-m road and pad	scavenged	-86.96682	40.70734
4/18/2024	red-headed woodpecker	172	carcass search	100-m road and pad	intact	-86.83234	40.61250
5/6/2024	European starling	166	carcass search	100-m road and pad	scavenged	-86.85885	40.63019
5/9/2024	Baltimore oriole	129	carcass search	100-m road and pad	scavenged	-86.96744	40.70717
5/9/2024	red-eyed vireo	136	carcass search	100-m road and pad	scavenged	-86.91878	40.70852
5/10/2024	red-winged blackbird	172	carcass search	100-m road and pad	dismembered	-86.83218	40.61252
5/13/2024	red-eyed vireo	111	carcass search	100-m road and pad	intact	-86.89254	40.74237
6/7/2024	indigo bunting	119	incidental	NA	scavenged	-86.87651	40.72267
6/10/2024	mallard	129	incidental	NA	intact	-86.96750	40.70727
7/30/2024	cedar waxwing	149	carcass search	70-m uncleared	scavenged	-86.85325	40.68223
7/30/2024	cliff swallow	165	carcass search	70-m cleared	scavenged	-86.86613	40.63020
8/1/2024	barn swallow	119	carcass search	100-m road and pad	scavenged	-86.87663	40.72299
8/1/2024	turkey vulture	112	carcass search	100-m road and pad	scavenged	-86.92063	40.73119
8/2/2024	American robin	145	carcass search	70-m cleared	scavenged	-86.89192	40.63746
8/2/2024	cliff swallow	133	carcass search	70-m cleared	scavenged	-86.94008	40.70901
8/2/2024	cliff swallow	145	carcass search	70-m cleared	scavenged	-86.89156	40.63728
8/2/2024	cliff swallow	145	carcass search	70-m cleared	scavenged	-86.89243	40.63696
8/2/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84792	40.61425
8/2/2024	killdeer	145	carcass search	70-m cleared	scavenged	-86.89173	40.63708
8/2/2024	unidentified swallow	132	carcass search	70-m cleared	scavenged	-86.94598	40.70885
8/2/2024	unidentified swallow	145	carcass search	70-m cleared	scavenged	-86.89159	40.63671
8/2/2024	unidentified swallow	145	carcass search	70-m cleared	scavenged	-86.89148	40.63750
8/5/2024	American robin	143	carcass search	70-m uncleared	scavenged	-86.87960	40.63548
8/5/2024	barn swallow	144	carcass search	70-m uncleared	scavenged	-86.88535	40.63547
8/5/2024	barn swallow	169	carcass search	70-m cleared	scavenged	-86.84817	40.61419
8/5/2024	horned lark	145	carcass search	70-m cleared	scavenged	-86.89215	40.63732
8/5/2024	killdeer	138	carcass search	70-m cleared	dismembered	-86.89026	40.70259
8/5/2024	red-winged blackbird	144	carcass search	70-m uncleared	scavenged	-86.88540	40.63548
8/5/2024	unidentified small bird	144	carcass search	70-m uncleared	scavenged	-86.88523	40.63559
8/6/2024	cliff swallow	131	carcass search	70-m uncleared	scavenged	-86.95250	40.70942

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Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/6/2024	horned lark	111	carcass search	70-m cleared	feather spot	-86.89370	40.74196
8/6/2024	horned lark	131	carcass search	70-m uncleared	scavenged	-86.95206	40.70956
8/6/2024	killdeer	114	carcass search	70-m uncleared	scavenged	-86.91190	40.72515
8/6/2024	unidentified swallow	131	carcass search	70-m uncleared	scavenged	-86.95207	40.70977
8/8/2024	European starling	170	carcass search	70-m cleared	scavenged	-86.84255	40.61456
8/8/2024	European starling	170	carcass search	70-m cleared	scavenged	-86.84257	40.61448
8/8/2024	unidentified small bird	143	carcass search	70-m uncleared	scavenged	-86.87890	40.63531
8/9/2024	cliff swallow	133	carcass search	70-m cleared	scavenged	-86.93975	40.70906
8/9/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86607	40.63014
8/9/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86618	40.62998
8/9/2024	horned lark	160	carcass search	70-m uncleared	scavenged	-86.84525	40.64414
8/9/2024	killdeer	140	carcass search	100-m road and pad	scavenged	-86.88240	40.65053
8/9/2024	killdeer	165	carcass search	70-m cleared	scavenged	-86.86588	40.62966
8/9/2024	unidentified passerine	135	carcass search	70-m cleared	feather spot	-86.92425	40.70892
8/9/2024	unidentified small bird	155	carcass search	70-m uncleared	scavenged	-86.82545	40.65979
8/9/2024	unidentified small bird	165	carcass search	70-m cleared	feather spot	-86.86618	40.63005
8/9/2024	yellow-billed cuckoo	155	carcass search	70-m uncleared	scavenged	-86.82517	40.65892
8/10/2024	Blackburnian warbler	138	carcass search	70-m cleared	scavenged	-86.89118	40.70223
8/10/2024	magnolia warbler	138	carcass search	70-m cleared	scavenged	-86.89131	40.70230
8/10/2024	mourning dove	138	carcass search	70-m cleared	feather spot	-86.89123	40.70296
8/12/2024	cliff swallow	130	carcass search	100-m road and pad	intact	-86.96231	40.70721
8/12/2024	cliff swallow	130	carcass search	100-m road and pad	intact	-86.96233	40.70751
8/12/2024	horned lark	145	carcass search	70-m cleared	scavenged	-86.89165	40.63742
8/12/2024	mourning dove	143	carcass search	70-m uncleared	intact	-86.87937	40.63541
8/12/2024	unidentified small bird	144	carcass search	70-m uncleared	scavenged	-86.88561	40.63504
8/14/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86624	40.63006
8/15/2024	brown-headed cowbird	165	carcass search	70-m cleared	feather spot	-86.86622	40.63014
8/15/2024	cliff swallow	145	carcass search	70-m cleared	scavenged	-86.89184	40.63726
8/15/2024	horned lark	165	carcass search	70-m cleared	feather spot	-86.86510	40.63007
8/15/2024	killdeer	160	carcass search	70-m uncleared	feather spot	-86.84411	40.64416
8/16/2024	unidentified small bird	133	carcass search	70-m cleared	feather spot	-86.93993	40.70829
8/19/2024	Baltimore oriole	148	carcass search	70-m cleared	scavenged	-86.86497	40.68190
8/19/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86618	40.63004
8/19/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86596	40.63037
8/19/2024	horned lark	143	carcass search	70-m uncleared	feather spot	-86.87887	40.63558
8/19/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84746	40.61416

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
8/19/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84774	40.61447
8/19/2024	horned lark	170	carcass search	70-m cleared	scavenged	-86.84155	40.61445
8/19/2024	horned lark	170	carcass search	70-m cleared	scavenged	-86.84254	40.61407
8/19/2024	horned lark	170	carcass search	70-m cleared	scavenged	-86.84270	40.61418
8/19/2024	unidentified swallow	145	carcass search	70-m cleared	scavenged	-86.89264	40.63688
8/20/2024	Cooper's hawk	133	carcass search	70-m cleared	scavenged	-86.93977	40.70934
8/22/2024	cliff swallow	164	carcass search	100-m road and pad	scavenged	-86.81777	40.64491
8/22/2024	horned lark	143	carcass search	70-m uncleared	scavenged	-86.87999	40.63544
8/22/2024	rock pigeon	165	carcass search	70-m cleared	feather spot	-86.86622	40.63009
8/22/2024	ruby-throated hummingbird	121	carcass search	100-m road and pad	scavenged	-86.85599	40.72498
8/22/2024	unidentified swallow	144	carcass search	70-m uncleared	scavenged	-86.88599	40.63497
8/26/2024	barn swallow	170	carcass search	70-m cleared	scavenged	-86.84224	40.61463
8/26/2024	rock pigeon	165	carcass search	70-m cleared	feather spot	-86.86616	40.63008
8/27/2024	American goldfinch	118	carcass search	100-m road and pad	scavenged	-86.88275	40.72379
8/27/2024	eastern meadowlark	114	carcass search	70-m uncleared	scavenged	-86.91113	40.72512
8/27/2024	horned lark	111	carcass search	70-m cleared	scavenged	-86.89322	40.74181
8/29/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86623	40.63004
8/29/2024	European starling	165	carcass search	70-m cleared	dismembered	-86.86620	40.63007
8/29/2024	horned lark	148	carcass search	70-m cleared	intact	-86.86556	40.68246
8/29/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84766	40.61404
8/29/2024	unidentified passerine	145	carcass search	70-m cleared	scavenged	-86.89145	40.63669
8/30/2024	horned lark	114	carcass search	70-m uncleared	dismembered	-86.91127	40.72521
8/30/2024	killdeer	133	carcass search	70-m cleared	feather spot	-86.94025	40.70891
9/2/2024	horned lark	138	carcass search	70-m cleared	feather spot	-86.89110	40.70208
9/2/2024	horned lark	148	carcass search	70-m cleared	scavenged	-86.86496	40.68161
9/2/2024	prothonotary warbler	165	carcass search	70-m cleared	scavenged	-86.86515	40.63002
9/2/2024	Tennessee warbler	145	carcass search	70-m cleared	scavenged	-86.89179	40.63662
9/2/2024	Tennessee warbler	148	carcass search	70-m cleared	scavenged	-86.86520	40.68189
9/3/2024	chimney swift	115	carcass search	100-m road and pad	scavenged	-86.90455	40.72485
9/3/2024	European starling	133	carcass search	70-m cleared	scavenged	-86.94011	40.70863
9/3/2024	European starling	133	carcass search	70-m cleared	intact	-86.93988	40.70875
9/3/2024	horned lark	111	carcass search	70-m cleared	scavenged	-86.89324	40.74180
9/3/2024	killdeer	135	carcass search	70-m cleared	scavenged	-86.92427	40.70891
9/3/2024	ovenbird	119	carcass search	100-m road and pad	scavenged	-86.87642	40.72258
9/4/2024	red-eyed vireo	121	carcass search	100-m road and pad	scavenged	-86.85662	40.72511
9/4/2024	red-eyed vireo	124	carcass search	100-m road and pad	scavenged	-86.86880	40.70701

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/5/2024	horned lark	145	carcass search	70-m cleared	scavenged	-86.89169	40.63722
9/5/2024	horned lark	148	carcass search	70-m cleared	scavenged	-86.86520	40.68182
9/5/2024	horned lark	148	carcass search	70-m cleared	scavenged	-86.86521	40.68218
9/5/2024	horned lark	148	carcass search	70-m cleared	scavenged	-86.86490	40.68222
9/5/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84760	40.61461
9/5/2024	horned lark	170	carcass search	70-m cleared	scavenged	-86.84223	40.61440
9/5/2024	horned lark	170	carcass search	70-m cleared	scavenged	-86.84198	40.61442
9/5/2024	killdeer	160	carcass search	70-m uncleared	scavenged	-86.84524	40.64413
9/5/2024	killdeer	169	carcass search	70-m cleared	scavenged	-86.84808	40.61423
9/5/2024	magnolia warbler	149	carcass search	70-m uncleared	scavenged	-86.85298	40.68240
9/5/2024	red-eyed vireo	145	carcass search	70-m cleared	scavenged	-86.89232	40.63647
9/6/2024	horned lark	135	carcass search	70-m cleared	feather spot	-86.92456	40.70892
9/6/2024	Tennessee warbler	132	carcass search	70-m cleared	scavenged	-86.94612	40.70841
9/7/2024	horned lark	111	carcass search	70-m cleared	scavenged	-86.89324	40.74210
9/7/2024	Tennessee warbler	111	carcass search	70-m cleared	scavenged	-86.89305	40.74177
9/9/2024	European starling	165	carcass search	70-m cleared	scavenged	-86.86613	40.63030
9/9/2024	horned lark	165	carcass search	70-m cleared	feather spot	-86.86631	40.63004
9/9/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84806	40.6138
9/9/2024	horned lark	169	carcass search	70-m cleared	scavenged	-86.84781	40.61417
9/9/2024	Philadelphia vireo	148	carcass search	70-m cleared	scavenged	-86.86563	40.68207
9/9/2024	ruby-throated hummingbird	144	carcass search	70-m uncleared	scavenged	-86.88593	40.63554
9/9/2024	Tennessee warbler	145	carcass search	70-m cleared	scavenged	-86.89211	40.63670
9/9/2024	Tennessee warbler	165	carcass search	70-m cleared	scavenged	-86.86517	40.62995
9/10/2024	European starling	112	carcass search	100-m road and pad	dismembered	-86.92115	40.73113
9/10/2024	Tennessee warbler	154	carcass search	70-m uncleared	scavenged	-86.82958	40.66333
9/11/2024	horned lark	111	carcass search	70-m cleared	scavenged	-86.89350	40.74208
9/11/2024	horned lark	111	carcass search	70-m cleared	feather spot	-86.89348	40.74242
9/11/2024	Swainson's thrush	146	carcass search	100-m road and pad	intact	-86.87710	40.62222
9/11/2024	wood thrush	133	carcass search	70-m cleared	intact	-86.93956	40.70863
9/12/2024	European starling	165	carcass search	70-m cleared	feather spot	-86.86614	40.63002
9/12/2024	horned lark	148	carcass search	70-m cleared	scavenged	-86.86503	40.68234
9/13/2024	horned lark	132	carcass search	70-m cleared	scavenged	-86.94621	40.70852
9/13/2024	killdeer	135	carcass search	70-m cleared	feather spot	-86.92454	40.70830
9/13/2024	ruby-throated hummingbird	154	carcass search	70-m uncleared	scavenged	-86.82956	40.66258
9/17/2024	European starling	116	carcass search	100-m road and pad	scavenged	-86.89667	40.72481
9/17/2024	magnolia warbler	106	carcass search	100-m road and pad	scavenged	-86.94559	40.74246

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
9/17/2024	red-eyed vireo	135	carcass search	70-m cleared	scavenged	-86.92526	40.70916
9/17/2024	ruby-throated hummingbird	133	carcass search	70-m cleared	scavenged	-86.94035	40.70865
9/17/2024	turkey vulture	131	carcass search	70-m uncleared	scavenged	-86.95310	40.70968
9/17/2024	unidentified gull	135	carcass search	70-m cleared	feather spot	-86.92511	40.70914
9/18/2024	red-winged blackbird	142	carcass search	100-m road and pad	intact	-86.87405	40.64460
9/19/2024	chimney swift	144	carcass search	70-m uncleared	scavenged	-86.88574	40.63580
9/19/2024	horned lark	148	carcass search	70-m cleared	feather spot	-86.86517	40.68150
9/19/2024	red-eyed vireo	154	carcass search	70-m uncleared	scavenged	-86.82964	40.66220
9/19/2024	unidentified flycatcher	143	carcass search	70-m uncleared	scavenged	-86.88017	40.63509
9/20/2024	European starling	109	carcass search	70-m uncleared	scavenged	-86.91121	40.74287
9/21/2024	horned lark	164	carcass search	100-m road and pad	scavenged	-86.81752	40.64442
9/21/2024	ruby-throated hummingbird	125	carcass search	100-m road and pad	scavenged	-86.87458	40.70711
9/23/2024	European starling	155	carcass search	70-m uncleared	scavenged	-86.82530	40.65960
9/24/2024	horned lark	132	carcass search	70-m cleared	dismembered	-86.94598	40.70888
9/24/2024	unidentified warbler	131	carcass search	70-m uncleared	scavenged	-86.95258	40.70948
9/24/2024	unidentified warbler	132	carcass search	70-m cleared	scavenged	-86.94651	40.70860
9/24/2024	unidentified warbler	111	carcass search	70-m cleared	scavenged	-86.89429	40.74239
9/25/2024	magnolia warbler	134	carcass search	100-m road and pad	intact	-86.93301	40.70851
9/26/2024	Baltimore oriole	145	carcass search	70-m cleared	scavenged	-86.89193	40.63682
9/26/2024	black-throated green warbler	148	carcass search	70-m cleared	scavenged	-86.86504	40.68168
9/26/2024	horned lark	148	carcass search	70-m cleared	scavenged	-86.86498	40.68201
9/27/2024	horned lark	111	carcass search	70-m cleared	dismembered	-86.89327	40.74216
9/27/2024	horned lark	132	carcass search	70-m cleared	dismembered	-86.94614	40.70868
9/27/2024	killdeer	111	carcass search	70-m cleared	feather spot	-86.89319	40.74184
9/27/2024	magnolia warbler	132	carcass search	70-m cleared	scavenged	-86.94525	40.70857
9/27/2024	red-eyed vireo	131	carcass search	70-m uncleared	scavenged	-86.95267	40.70973
9/30/2024	killdeer	170	carcass search	70-m cleared	scavenged	-86.84197	40.61405
9/30/2024	unidentified warbler	154	carcass search	70-m uncleared	scavenged	-86.82928	40.66242
10/1/2024	golden-crowned kinglet	136	carcass search	100-m road and pad	scavenged	-86.91803	40.70870
10/1/2024	prairie warbler	119	carcass search	100-m road and pad	scavenged	-86.87696	40.72269
10/1/2024	unidentified hummingbird	111	carcass search	70-m cleared	scavenged	-86.89385	40.74210
10/2/2024	Tennessee warbler	161	carcass search	100-m road and pad	intact	-86.83617	40.64519
10/3/2024	European starling	160	carcass search	70-m uncleared	scavenged	-86.84521	40.64428
10/3/2024	unidentified kingbird	170	carcass search	70-m cleared	scavenged	-86.84277	40.61374
10/7/2024	golden-crowned kinglet	117	carcass search	100-m road and pad	intact	-86.88923	40.72344
10/7/2024	golden-crowned kinglet	143	carcass search	70-m uncleared	scavenged	-86.87994	40.63507

Appendix A. Carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Found Date	Common Name	Turbine	Search Type	Plot Type	Physical Condition	Latitude	Longitude
10/7/2024	golden-crowned kinglet	145	carcass search	70-m cleared	scavenged	-86.89183	40.63671
10/7/2024	golden-crowned kinglet	160	carcass search	70-m uncleared	scavenged	-86.84480	40.64427
10/7/2024	Tennessee warbler	145	carcass search	70-m cleared	scavenged	-86.89195	40.63713
10/7/2024	unidentified warbler	145	carcass search	70-m cleared	scavenged	-86.89266	40.63725
10/7/2024	white-throated sparrow	170	carcass search	70-m cleared	scavenged	-86.84202	40.61386
10/8/2024	brown creeper	122	carcass search	100-m road and pad	scavenged	-86.85694	40.70698
10/8/2024	brown creeper	155	carcass search	70-m uncleared	dismembered	-86.82636	40.65929
10/8/2024	red-eyed vireo	155	carcass search	70-m uncleared	scavenged	-86.82531	40.65958
10/10/2024	brown creeper	154	carcass search	70-m uncleared	scavenged	-86.82999	40.66281
10/10/2024	golden-crowned kinglet	148	carcass search	70-m cleared	dismembered	-86.86568	40.68248
10/10/2024	ruby-crowned kinglet	148	carcass search	70-m cleared	scavenged	-86.86536	40.68196
10/10/2024	sharp-shinned hawk	170	carcass search	70-m cleared	intact	-86.84196	40.61406
10/10/2024	Tennessee warbler	154	carcass search	70-m uncleared	scavenged	-86.82940	40.66250
10/10/2024	unidentified small bird	149	carcass search	70-m uncleared	feather spot	-86.85328	40.68263
10/10/2024	unidentified warbler	144	carcass search	70-m uncleared	scavenged	-86.88488	40.63519
10/11/2024	golden-crowned kinglet	160	carcass search	70-m uncleared	scavenged	-86.84503	40.64351
10/14/2024	brown creeper	119	carcass search	100-m road and pad	intact	-86.87681	40.72315
10/14/2024	golden-crowned kinglet	143	carcass search	70-m uncleared	scavenged	-86.87887	40.63540
10/14/2024	golden-crowned kinglet	143	carcass search	70-m uncleared	scavenged	-86.87884	40.63501
10/15/2024	killdeer	122	carcass search	100-m road and pad	intact	-86.85619	40.70684

* Carcass estimated time of death outside of the study period.

** Carcass was found outside the search area.

m = meters; N/A = not applicable.

Appendix B. Searcher Efficiency, Carcass Persistence, and Truncated Weighted Likelihood Area Adjustment Estimate Model Fitting Results

Appendix B1. Searcher efficiency models for 100-meter roads and pads at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Covariates	*k* Value	AICc	Delta AICc
Season	0.67	51.53	0
No covariates	0.67	52.15	0.62*

* Selected model.

AICc is corrected Akaike Information Criterion; Delta AICc is the difference between the AICc of a given model and the lowest AICc value.

Appendix B2. Searcher efficiency models for 70-meter plots at the Indiana Crossroads Wind Farm, White County, Indiana, August 1 – October 15, 2024.

Covariates	*k* Value	AICc	Delta AICc
No covariates	0.67	56.85	0*
Plot type	0.67	58.95	2.10

* Selected model.

AICc is corrected Akaike Information Criterion; Delta AICc is the difference between the AICc of a given model and the lowest AICc value.

Appendix B3. Number of carcass persistence trials placed by season for the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Season	Plot Type	Number of Carcasses Placed
Spring	100-meter (m) road and pad	15
Fall	100-m road and pad	15
Fall	70-m cleared plots	17
Fall	70-m uncleared plots	16

Appendix B4. Carcass persistence models with covariates and distributions for 70-meter plots at the Indiana Crossroads Wind Farm, White County, Indiana, August 1 – October 15, 2024.

Location Covariates	Scale Covariates	Distribution	AICc	Delta AICc
No Covariates	No Covariates	Weibull	117.04	0*
No Covariates	No Covariates	lognormal	117.09	0.05
No Covariates	No Covariates	loglogistic	117.23	0.19
Plot Type	No Covariates	Weibull	118.62	1.58
Plot Type	No Covariates	lognormal	118.87	1.83
Plot Type	No Covariates	loglogistic	118.91	1.87
No Covariates	Plot Type	lognormal	119.36	2.32
No Covariates	Plot Type	Weibull	119.47	2.43
No Covariates	Plot Type	loglogistic	119.52	2.48
Plot Type	Plot Type	Weibull	121.19	4.15
Plot Type	Plot Type	lognormal	121.24	4.2
Plot Type	Plot Type	loglogistic	121.33	4.29
No Covariates	–	exponential	130.68	13.64
Plot Type	–	exponential	131.54	14.5

* Selected model.

AICc is corrected Akaike Information Criterion; Delta AICc is the difference between the AICc of a given model and the lowest AICc value.

Appendix B5. Carcass persistence models with covariates and distributions for 100-meter roads and pads at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Location Covariates	Scale Covariates	Distribution	AICc	Delta AICc
Season	–	exponential	124.58	0
No Covariates	–	exponential	125.51	0.93*
Season	No Covariates	Weibull	126.37	1.79
No Covariates	No Covariates	Weibull	126.60	2.02
Season	Season	Weibull	127.31	2.73
No Covariates	Season	Weibull	127.87	3.29
Season	No Covariates	lognormal	127.99	3.41
Season	No Covariates	loglogistic	128.12	3.54
No Covariates	No Covariates	lognormal	129.40	4.82
No Covariates	No Covariates	loglogistic	129.41	4.83
Season	Season	lognormal	129.66	5.08
Season	Season	loglogistic	129.74	5.16
No Covariates	Season	loglogistic	131.03	6.45
No Covariates	Season	lognormal	131.12	6.54

* Selected model.

AICc is corrected Akaike Information Criterion; Delta AICc is the difference between the AICc of a given model and the lowest AICc value.

Note: Model output is clipped to display the top 10 selected models.

Appendix B6. Carcass persistence top models with covariates, distributions, and model parameters for the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Plot Type	Distribution*	Estimated Median Removal Times (days)	Parameter 1	Parameter 2
70-meter cleared plots	Weibull	6.18	0.439[1]	14.253[3]
100-meter roads and pads	exponential	4.06	0.171[2]	–

* Parameterization follows the base R parameterization for this distribution.

[1] Parameter 1 for the Weibull distribution is shape.

[2] Parameter 1 for exponential distribution is rate.

[3] Parameter 2 for the Weibull distribution is scale.

Appendix B7. Number and percent (%) of bat carcasses found at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

	Included in Area Correction		Outside Search Area*		Outside Study Period*		Total	
Species	**Total**	**%**	**Total**	**%**	**Total**	**%**	**Total**	**%**
eastern red bat	182	33.0	2	40	17	31.5	201	33.0
silver-haired bat	184	33.4	2	40	1	1.9	187	30.7
big brown bat	94	17.1	1	20	14	25.9	109	17.9
hoary bat	73	13.2	0	0	19	35.2	92	15.1
eastern red bat or Seminole bat	6	1.1	0	0	0	0.0	6	1.0
unidentified Lasiurus bat	5	0.9	0	0	1	1.9	6	1.0
evening bat	4	0.7	0	0	2	3.7	6	1.0
unidentified non-Myotis	2	0.4	0	0	0	0	2	0.3
tricolored bat	1	0.2	0	0	0	0	1	0.2
Total	**551**	**100**	**5**	**100**	**54**	**100**	**610**	**100**

* Carcasses not included in analysis.

Sums may not equal totals shown due to rounding.

Appendix B8. Search area adjustment models for bats from the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Distribution	AICc	DeltaAICc
Weibull	23,064.64	0*
normal	23,091.66	27.01
gamma	23,107.44	42.79
Gompertz	23,182.23	117.58

* Selected model.

AICc is corrected Akaike Information Criterion; Delta AICc is the difference between the AICc of a given model and the lowest AICc value.

Appendix B9. Truncated weighted maximum likelihood search area adjustment estimates for the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Plot Type	Number of Bats	Area Correction	Distribution	Parameter 1	Parameter 2
100-meter (m) road and pads	188	0.23	Weibull	1.7329	49.1352
70-m cleared and uncleared plots	363	0.86	Weibull	1.7329	49.1352

Appendix C. Inputs for Single Class and Multiple Class Modules in Evidence of Absence

Appendix C1. Inputs needed to run Evidence of Absence (EoA): Single Class Module for the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Season	Plot Type	Search Interval (*I*)	Number of searches	Spatial Coverage (*a*)	Searcher Efficiency		Carcass Persistence[1]			
					Carcasses Available	Carcasses Found	Shape (α)	Scale (β)	Scale Lower Limit (β)	Scale Upper Limit (β)
spring	100-m road and pad	7.0	7	0.23	45	34	–	5.86	4.01	8.57
fall	70-m cleared	3.5	22	0.86	42	27	0.44	14.25	5.23	38.82
fall	70-m uncleared	3.5	21	0.86	42	27	0.44	14.25	5.23	38.82
fall	100-m road and pad	7.0	12	0.23	45	34	–	5.86	4.01	8.57

[1.] An exponential distribution was used for the road and pad and cleared and uncleared plot carcass persistence distribution.

Note: Values for temporal coverage (*v*) were set to 1, and arrival proportions were accounted for in the Multiple Class Module.

m = meters.

Appendix C2. Inputs needed to run Evidence of Absence: Multiple Class Module for within season plot type detection probabilities at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Season	Plot Type	Ba	Bb	Within-Season Sampling Fraction	Within-Season Relative Operations	Within Season Weights (ρ)
spring	100-m road and pad	52.45	448.68	1.00	1.00	1.00
fall	70-m cleared	36.84	39.86	0.14	1.00	0.14
fall	70-m uncleared	36.84	39.93	0.13	1.00	0.13
fall	100-m road and pad	52.39	446.38	0.74	1.00	0.74

Ba and Bb are the parameters for the beta distribution used to characterize the probability of detection.

m = meter.

Appendix C3. Inputs needed to run Evidence of Absence: Multiple Class Module for seasonal detection probabilities at the Indiana Crossroads Wind Farm, White County, Indiana, April 1 – May 15 and August 1 – October 15, 2024.

Season	Plot Type	Ba	Bb	Relative Operations	Temporal Coverage (*v*)	Weights (ρ)
spring	100-m road and pad	52.45	448.68	1	0.11	0.11
fall	100-m road and pad and 70-m plots	154.59	603.14	1	0.89	0.89

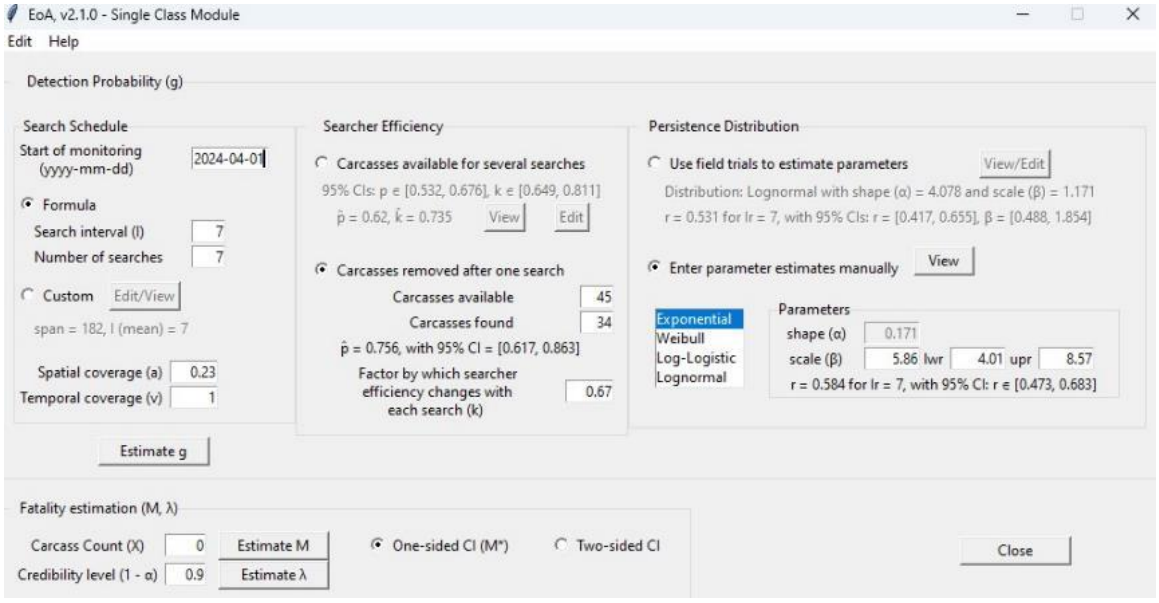
Ba and Bb are the parameters for the beta distribution used to characterize the probability of detection.

m = meter.

Appendix C4. Inputs needed to run Evidence of Absence: Multiple Years Module for the Indiana Crossroads Wind Farm, White County, Indiana, from 2022–2024.

Year	*g*	95% Credible Interval	Ba	Bb	Weights (ρ)
2022	0.20	0.17–0.23	122.09	485.40	0.84
2023	0.28	0.26–0.30	444.49	1161.19	1.00
2024	0.19	0.17–0.22	174.92	731.01	1.00
Overall	**0.22**	**0.21–0.24**	**655.37**	**2,258.43**	

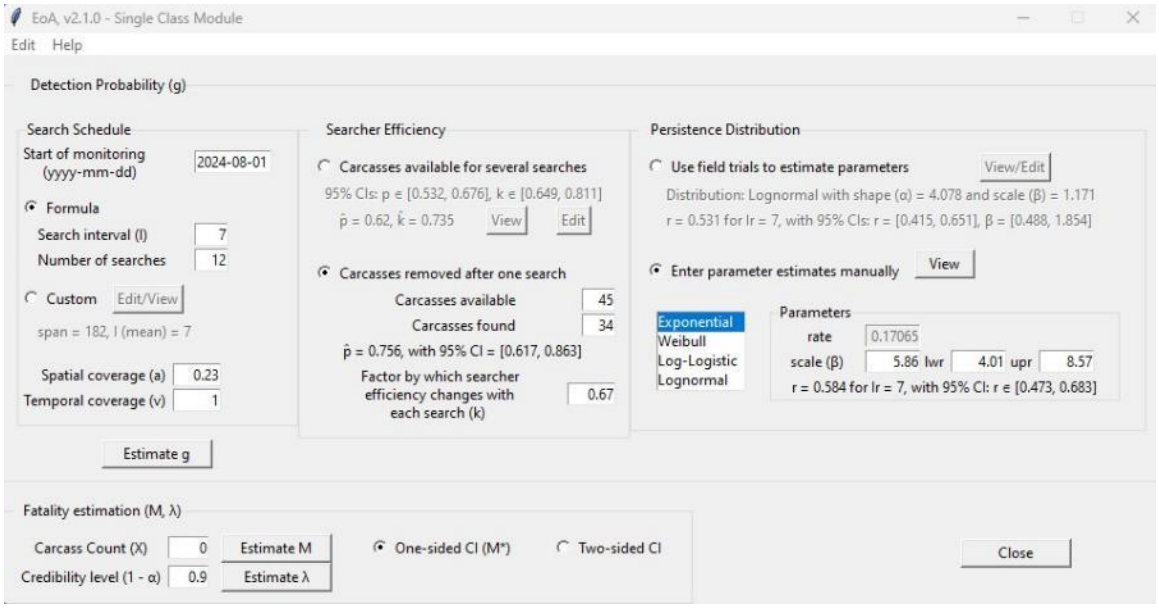
Ba and Bb are the parameters for the beta distribution used to characterize the probability of detection.



Estimated detection probability (g)

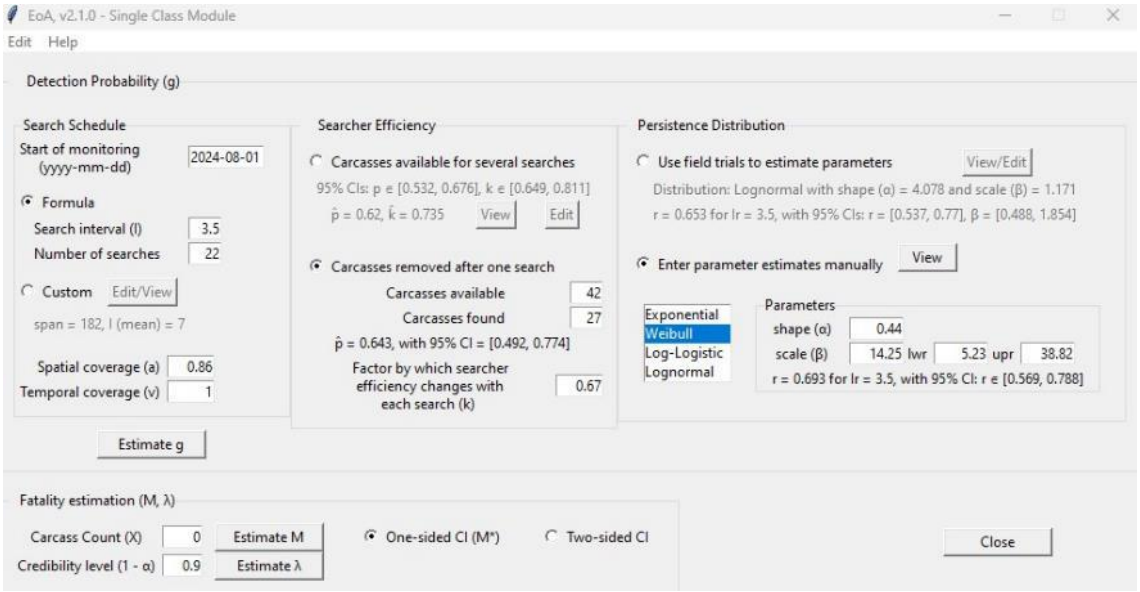
```
Summary statistics for estimation of detection probability (g)
================================================================================
Results:

Full site for full year
   Estimated g = 0.105, 95% CI = [0.0806, 0.133]
   Fitted beta distribution parameters for estimated g: Ba = 54.9946, Bb = 466.5162


Full site for monitored period, 01-Apr-2024 through 20-May-2024
   Estimated g = 0.105, 95% CI = [0.0806, 0.133]
   Fitted beta distribution parameters for estimated g: Ba = 54.9946, Bb = 466.5162
   Temporal coverage (within year) = 1


Searched area for monitored period, 01-Apr-2024 through 20-May-2024
   Estimated g = 0.458, 95% CI = [0.346, 0.573]
   Fitted beta distribution parameters for estimated g: Ba = 33.5339, Bb = 39.6082

================================================================================
Input:
Search parameters
   trial carcasses placed = 45, carcasses found = 34
   estimated searcher efficiency: p = 0.756, 95% CI = [0.617, 0.863]
   k = 0.67
   Search schedule: Search interval (I) = 7, number of searches = 7, span = 49
     spatial coverage: 0.23     temporal coverage: 1
--------------------------------------------------------------------------------
Carcass persistence:
   Exponential persistence distribution
     scale (β) = 5.86
     95% CI β = [4.01, 8.57] and r = 0.584 for Ir = 7 with 95% CI = [0.473, 0.683]
     Parameters entered manually
   Uniform arrivals
```

Appendix C5. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Single Class Module inputs for Spring 2024, 100-meter road and pad searches at 72 4.2-megawatt turbines, searched at a 7-day interval.



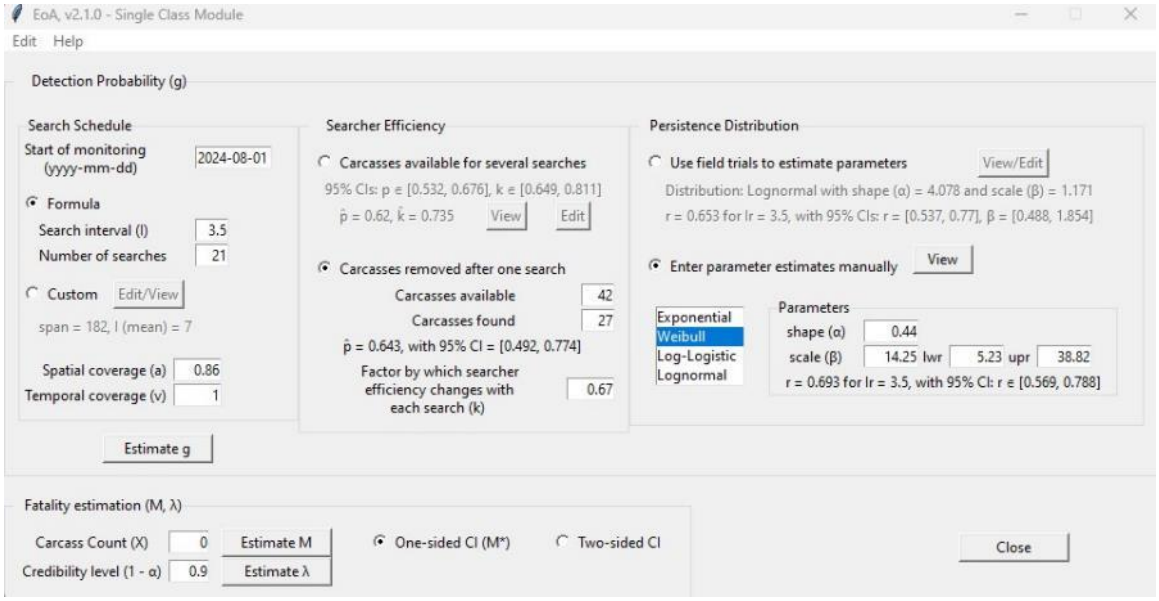

```
Summary statistics for estimation of detection probability (g)
================================================================================
Results:

Full site for full year
   Estimated g = 0.106, 95% CI = [0.0802, 0.134]
   Fitted beta distribution parameters for estimated g: Ba = 52.7564, Bb = 447.1957


Full site for monitored period, 01-Aug-2024 through 24-Oct-2024
   Estimated g = 0.106, 95% CI = [0.0802, 0.134]
   Fitted beta distribution parameters for estimated g: Ba = 52.7564, Bb = 447.1957
   Temporal coverage (within year) = 1


Searched area for monitored period, 01-Aug-2024 through 24-Oct-2024
   Estimated g = 0.459, 95% CI = [0.344, 0.575]
   Fitted beta distribution parameters for estimated g: Ba = 32.1007, Bb = 37.8675

================================================================================
Input:
Search parameters
   trial carcasses placed = 45, carcasses found = 34
   estimated searcher efficiency: p = 0.756, 95% CI = [0.617, 0.863]
   k = 0.67
   Search schedule: Search interval (I) = 7, number of searches = 12, span = 84
     spatial coverage: 0.23     temporal coverage: 1
________________________________________________________________________________
Carcass persistence:
   Exponential persistence distribution
     scale (β) = 5.86
     95% CI β = [4.01, 8.57] and r = 0.584 for Ir = 7 with 95% CI = [0.473, 0.683]
     Parameters entered manually
   Uniform arrivals
________________________________________________________________________________
```

Appendix C6. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Single Class Module inputs for fall 2024, 100-meter road and pad searches at 53 4.2-megawatt turbines searched at a 7-day interval.



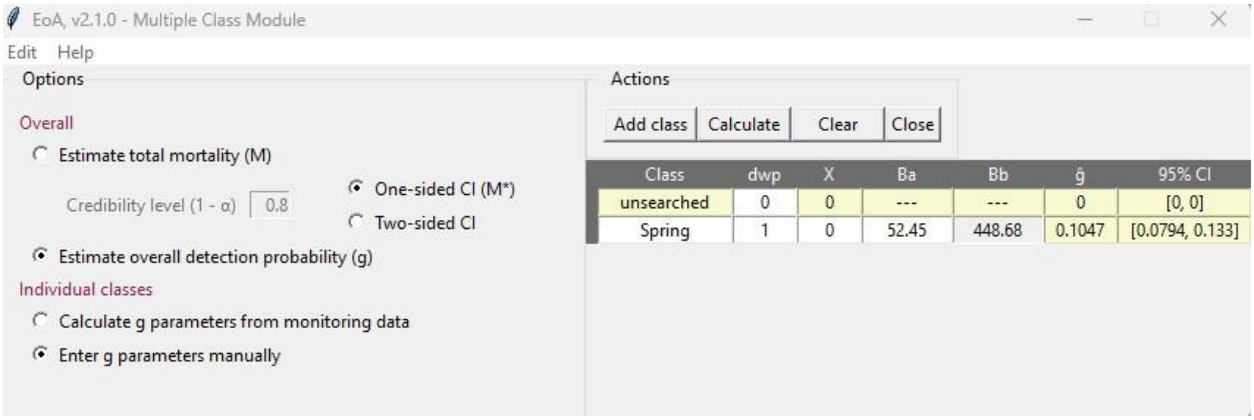

```
Summary statistics for estimation of detection probability (g)
================================================================================
Results:

Full site for full year
   Estimated g = 0.482, 95% CI = [0.372, 0.593]
   Fitted beta distribution parameters for estimated g: Ba = 37.0221, Bb = 39.789


Full site for monitored period, 01-Aug-2024 through 17-Oct-2024
   Estimated g = 0.482, 95% CI = [0.372, 0.593]
   Fitted beta distribution parameters for estimated g: Ba = 37.0221, Bb = 39.789
   Temporal coverage (within year) = 1


Searched area for monitored period, 01-Aug-2024 through 17-Oct-2024
   Estimated g = 0.56, 95% CI = [0.43, 0.687]
   Fitted beta distribution parameters for estimated g: Ba = 31.37, Bb = 24.6015

================================================================================
Input:
Search parameters
   trial carcasses placed = 42, carcasses found = 27
   estimated searcher efficiency: p = 0.643, 95% CI = [0.492, 0.774]
   k = 0.67
   Search schedule: Search interval (I) = 3.5, number of searches = 22, span = 77
     spatial coverage: 0.86     temporal coverage: 1
--------------------------------------------------------------------------------
Carcass persistence:
   Weibull persistence distribution
     shape (α) = 0.44 and scale (β) = 14.25
     95% CI β = [5.23, 38.82]
     r = 0.693 for Ir = 3.5 with 95% CI = [0.569, 0.788]
     Parameters entered manually
   Uniform arrivals
--------------------------------------------------------------------------------
```

Appendix C7. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Single Class Module inputs for fall 2024, 70-meter cleared plot searches at 10 4.2-megawatt turbines searched at a 3.5-day interval.



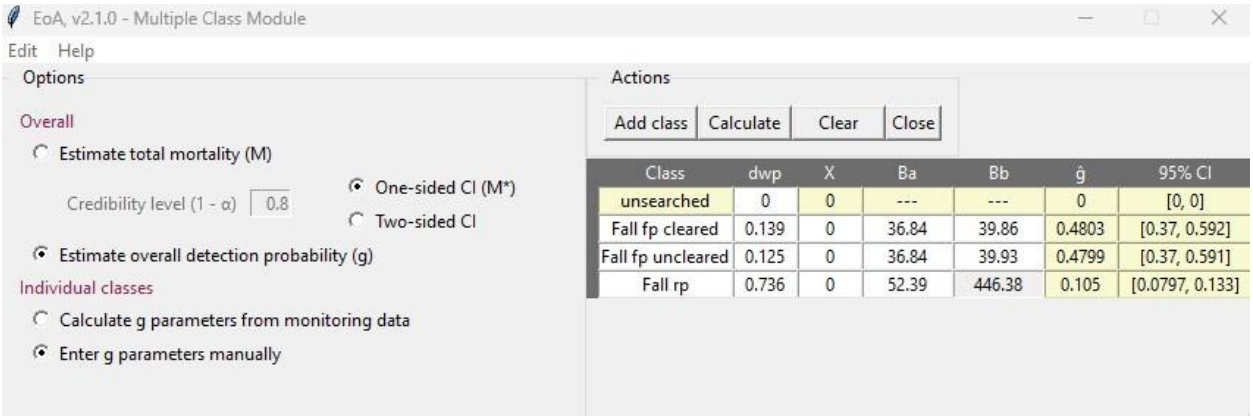

```
Summary statistics for estimation of detection probability (g)
================================================================================
Results:

Full site for full year
   Estimated g = 0.481, 95% CI = [0.37, 0.594]
   Fitted beta distribution parameters for estimated g: Ba = 36.2676, Bb = 39.0749


Full site for monitored period, 01-Aug-2024 through 13-Oct-2024
   Estimated g = 0.481, 95% CI = [0.37, 0.594]
   Fitted beta distribution parameters for estimated g: Ba = 36.2676, Bb = 39.0749
   Temporal coverage (within year) = 1


Searched area for monitored period, 01-Aug-2024 through 13-Oct-2024
   Estimated g = 0.56, 95% CI = [0.428, 0.687]
   Fitted beta distribution parameters for estimated g: Ba = 30.7452, Bb = 24.182

================================================================================
Input:
Search parameters
   trial carcasses placed = 42, carcasses found = 27
   estimated searcher efficiency: p = 0.643, 95% CI = [0.492, 0.774]
   k = 0.67
   Search schedule: Search interval (I) = 3.5, number of searches = 21, span = 73.5
     spatial coverage: 0.86     temporal coverage: 1

--------------------------------------------------------------------------------
Carcass persistence:
   Weibull persistence distribution
     shape (α) = 0.44 and scale (β) = 14.25
     95% CI β = [5.23, 38.82]
     r = 0.693 for Ir = 3.5 with 95% CI = [0.569, 0.788]
     Parameters entered manually
   Uniform arrivals
```

Appendix C8. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Single Class Module inputs for fall 2024, 70-meter uncleared plot searches at nine 4.2-megawatt turbines searched at a 3.5-day interval.



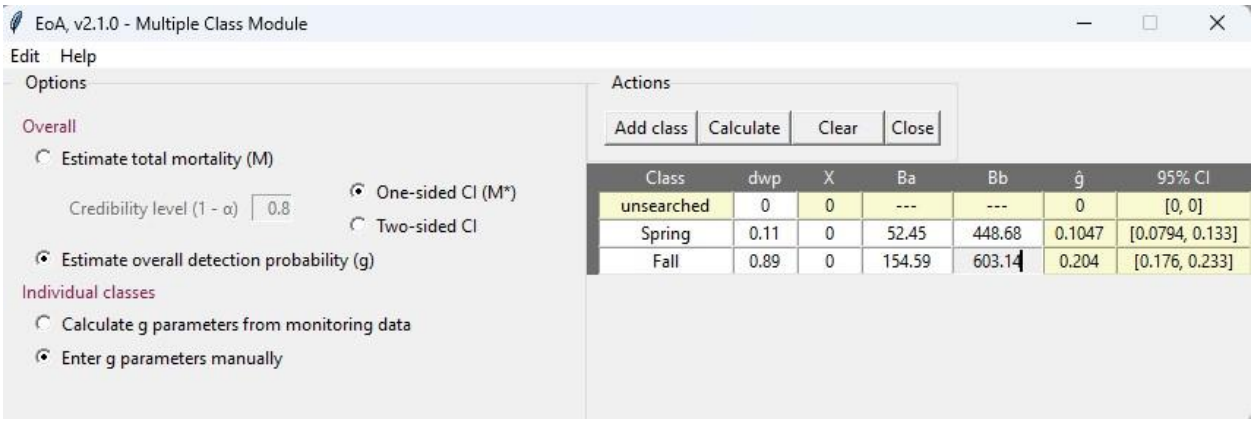

```
Summary statistics for multiple class estimate
================================================================================
Input: Detection probability, by search class
  Search coverage = 1

  Class          DWP     X    Ba     Bb    ghat    95% CI
  unsearched       0     0   ---    ---     0   [    0,     0]
  Spring           1     0  52.45  448.7 0.105 [0.079, 0.133]
================================================================================
Results for full site
--------------------------------------------------------------------------------

Detection probability
  Estimated g = 0.105, 95% CI = [0.079, 0.133]
  Fitted beta distribution parameters for estimated g: Ba = 52.45, Bb = 448.68

Mortality

Test of assumed relative weights (rho)
  Class          Assumed   Fitted (95% CI)
  unsearched       0.000      NA
  Spring           1.000    [1.000, 1.000]
  p = 1 for likelihood ratio test of H0: assumed rho = true rho
```

Appendix C9. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Multiple Class Module inputs for spring 2024 turbine types (n = 72) searched at a 7-day interval.



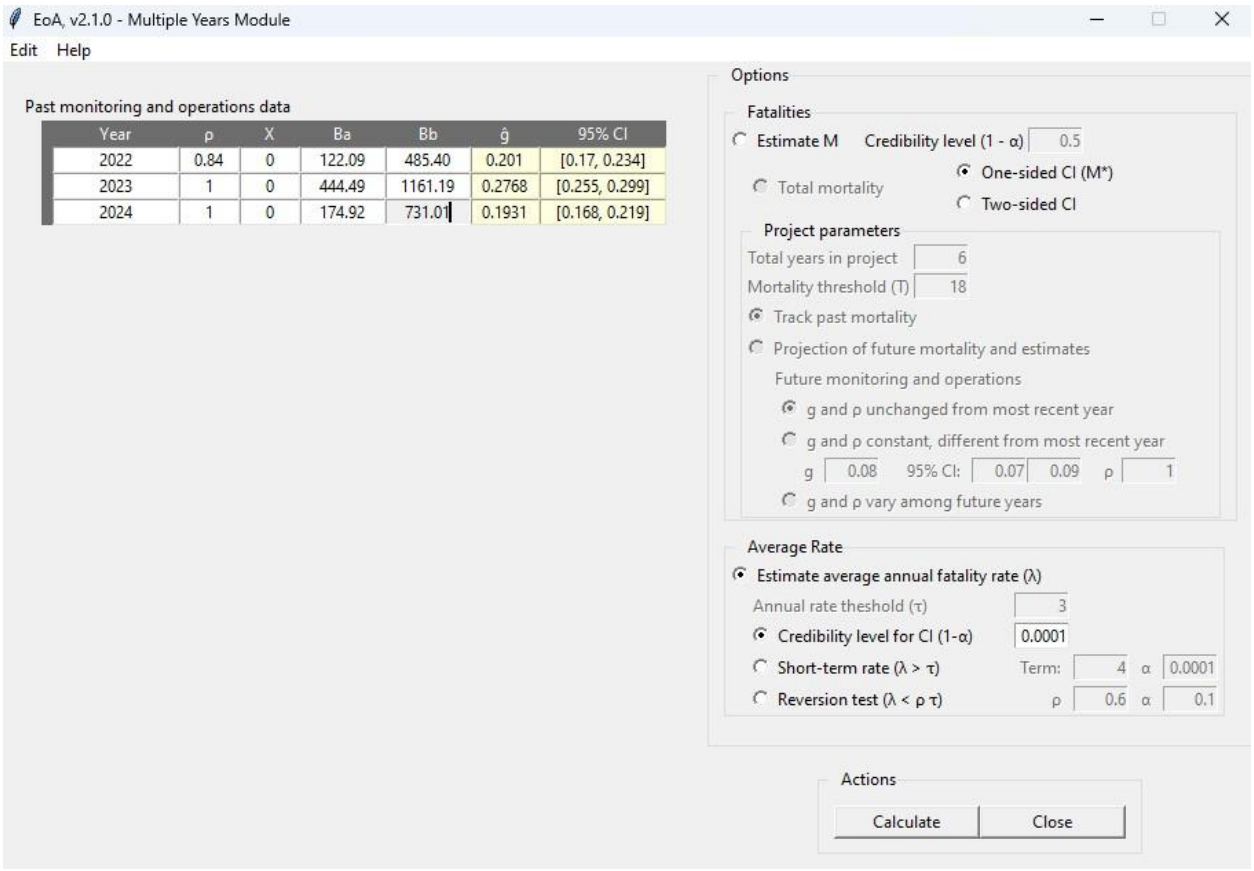

```
Summary statistics for multiple class estimate
================================================================================
Input: Detection probability, by search class
  Search coverage = 1

  Class                DWP     X    Ba     Bb   ghat    95% CI
  unsearched             0     0   ---    ---    0   [    0,     0]
  Fall fp cleared    0.139     0  36.84  39.86 0.480 [0.370, 0.592]
  Fall fp uncleared  0.125     0  36.84  39.93 0.480 [0.370, 0.591]
  Fall rp            0.736     0  52.39  446.4 0.105 [0.080, 0.133]
================================================================================
Results for full site
________________________________________________________________________________

Detection probability
  Estimated g = 0.204, 95% CI = [0.176, 0.233]
  Fitted beta distribution parameters for estimated g: Ba = 154.5885, Bb = 602.9899

Mortality

Test of assumed relative weights (rho)
  Class                Assumed   Fitted (95% CI)
  unsearched             0.000      NA
  Fall fp cleared        0.139    [0.001, 0.870]
  Fall fp uncleared      0.125    [0.001, 0.900]
  Fall rp                0.736    [0.014, 0.989]
  p = 1 for likelihood ratio test of H0: assumed rho = true rho
```

Appendix C10. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Multiple Class Module inputs for fall 2023 plot types and turbine types (n =72) searched at a 7-day interval for 100-meter roads and pads, and a 3.5-day interval for 70-meter plots.




```
Summary statistics for multiple class estimate
================================================================================
Input: Detection probability, by search class
  Search coverage = 1

  Class          DWP     X    Ba     Bb   ghat    95% CI
  unsearched       0     0   ---    ---    0   [    0,     0]
  Spring        0.11     0  52.45  448.7 0.105 [0.079, 0.133]
  Fall          0.89     0  154.6  603.1 0.204 [0.176, 0.233]
================================================================================
Results for full site
--------------------------------------------------------------------------------

Detection probability
  Estimated g = 0.193, 95% CI = [0.168, 0.219]
  Fitted beta distribution parameters for estimated g: Ba = 174.9239, Bb = 731.0031

Mortality

Test of assumed relative weights (rho)
  Class          Assumed   Fitted (95% CI)
  unsearched       0.000      NA
  Spring           0.110    [0.008, 0.998]
  Fall             0.890    [0.002, 0.992]
  p = 1 for likelihood ratio test of H0: assumed rho = true rho
```

Appendix C11. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Multiple Class Module inputs for seasonal detection probabilities 2024 (n = 72 turbines in spring, 72 in fall) searched at a 7-day interval in the spring, a 7-day interval in the fall for 100-meter roads and pads, and a 3.5-day interval in the fall for 70-meter plots.




```
Estimation of mortality rate (stochastic) over 3 years
Years: 2022 - 2024
================================================================================
Results
Total number of carcasses recovered: 0
Estimated overall detection probability, g = 0.225, 95% CI = [0.21, 0.24]
   Ba = 655.01, Bb = 2257.4

Estimated annual fatality rate:
 lambda = 0.742 with 0.01% CI = [0.337, 0.338]
```

```
Input
Threshold for short-term rate (tau) =  3  per year

Year (or period) rel_wt  X    Ba     Bb   ghat    95% CI
2022             0.840   0  122.1  485.4 0.201 [0.170, 0.234]
2023             1.000   0  444.5   1161 0.277 [0.255, 0.299]
2024             1.000   0  174.9    731 0.193 [0.168, 0.219]
```

Appendix C12. Screen shot of Evidence of Absence (v2.1.0) graphical user interface, Multiple Years Module inputs for estimation of annual fatality rate (λ) for Indiana bats and northern long-eared bats for 2022 – 2024. The Evidence of Absence graphical user interface by default produced the mean annual fatality rate; the credible interval converges on the median annual fatality rate when α is near 0. By setting the credibility to 0.0001, the upper and lower bounds of the credible interval produced the median annual fatality rate