

DRAFT

**Supplemental Environmental Assessment for Proposed Amended Habitat
Conservation Plan and Incidental Take Permit**

**The Cardinal Point Wind Project
McDonough and Warren Counties, Illinois**



**U.S. Fish and Wildlife Service
Iowa-Illinois Ecological Services Field Office
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Abbreviations

Applicant	Capital Power Corporation
Cardinal Point	Cardinal Point LLC
CFR	Code of Federal Regulations
Covered Species	Indiana bat, northern long-eared bat, tricolored bat, little brown bat
EA	Environmental Assessment
ESA	Endangered Species Act of 1973, as amended
°F	Degrees Fahrenheit
HCP	Habitat Conservation Plan
ITP	Incidental Take Permit
m/s	meters per second
MidAmerican	MidAmerican Energy Company
MW	megawatt
NEPA	National Environmental Policy Act
NREL	National Renewable Energy Laboratory
OCRU	Ozark-Central Recovery Unit
OSC	optimized smart curtailment
Permit Area	All leased lands associated with the Project where Covered Activities may occur
Project	Cardinal Point Wind Project
SEA	Supplemental Environment Assessment
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
WEST	Western EcoSystems Technology, Inc.
WNS	white-nose syndrome

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1.0 PROJECT OVERVIEW, BACKGROUND, PURPOSE, AND NEED

1.1 INTRODUCTION

The U.S. Fish and Wildlife Service (Service or USFWS) prepared a Final Environmental Assessment (Final 2023 EA) and issued a Finding of No Significant Impact (2023 FONSI) and Incidental Take Permit (2023 ITP) for the Cardinal Point Wind Project (Project) on August 7, 2023 to cover incidental take of federally listed bat species associated with the operation of the Project. The Applicant (see below) has proposed an amendment to their ITP to increase the take authorization for tricolored bats (*Perimyotis subflavus*) because the cumulative take estimate derived from the first year of ITP monitoring is approaching the authorized take limit (Hale et al. 2024). This supplemental Environmental Assessment (SEA) has been prepared by the USFWS pursuant to the National Environmental Policy Act (NEPA) 42 U.S. Code (USC) § 4321 *et seq.* The SEA evaluates the effects of issuing an amended ITP pursuant to Section 10(a)(1)(B) of the federal Endangered Species Act of 1973, as amended (ESA), 16 USC §§1531–1539 for activities associated with the Project (see Section 1.3 for more details).

The Project is owned and operated by Cardinal Point LLC (Cardinal Point), a wholly owned subsidiary of Capital Power Corporation (Applicant). The Project is in an area that supports the federally listed endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), the non-listed little brown bat (*Myotis lucifugus*; under review for federal listing), and the proposed for listing tricolored bat during the spring and fall migratory periods. As stated above, the Applicant obtained an ITP for these species (referred to as “Covered Species” throughout) on August 7, 2023 (2023 ITP) through the development of the *Indiana bat, Northern Long-eared Bat, Little Brown Bat, and Tricolored Bat Habitat Conservation Plan for the Cardinal Point Wind Project* (2023 HCP). The 2023 HCP was developed to ensure that impacts to the Covered Species are minimized and mitigated to the maximum extent practicable in accordance with the requirements of Section 10 of the ESA. The 2023 ITP authorized a specified amount of incidental take of the Covered Species during Project operations and the implementation of mitigation measures for a term of six years.

Following the implementation of the HCP in 2023, eight Indiana bat carcasses were discovered between August 22 and September 29, 2023, and five tricolored bat carcasses were discovered between August 21 and September 11, 2023 (Hale et al. 2024). While the Indiana bat fatalities were in line with projected take and expected to stay within the authorized take levels, the five tricolored bat fatalities were higher than expected and are projected to exceed the authorized take for the species. For this reason, the Applicant has amended their 2023 HCP to ensure that impacts to the Covered Species are minimized and mitigated to the maximum extent practicable in accordance with the requirements of Section 10 of the ESA and is requesting an ITP amendment to increase the take authorized for tricolored bats for the Project. The Service received an application on May 6, 2024 for an amended ITP from the Applicant. The amended ITP, if issued, would authorize a higher level of incidental take for tricolored bats during Project operations and would require implementation of additional mitigation acres for the Project for the remaining five years of the permit term.”

The Service has prepared this SEA to inform the public of the Proposed Action (also referred to as Alternative 2: the HCP Amendment Alternative), the effects of the Proposed Action, and its alternatives, as well as to seek information from the public and to use information collected and analyzed to ensure that information regarding environmental impacts is available to federal decision-makers before a decision is made on amending the 2023 ITP. The scope of this SEA does not cover the entire Project and is limited to the increase in authorized take for tricolored bat and the effects of the additional mitigation

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acres for the purposes of an ITP amendment. This SEA incorporates the environmental analysis from the Final 2023 EA by reference wherever appropriate.

The ESA and its implementing regulations prohibit the take of any fish or wildlife that is designated as a threatened species or endangered species under Section 4 of the ESA (federally listed species) without prior approval pursuant to either Section 7 or Section 10(a)(1)(B) of the ESA. The ESA defines “take” as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” (16 USC §1532(19)). Pursuant to the Code of Federal Regulations (CFR), “incidental taking” means “any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity” (50 CFR 17.3). “Harm” is defined in the CFR as “an act which actually kills or injures [federally listed] wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures [federally listed] wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering” (50 CFR 17.3). “Harass” means “an intentional or negligent act or omission which creates the likelihood of injury to [federally listed] wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering” (50 CFR 17.3).

Issuance of a Section 10 ITP amendment constitutes a discretionary federal action by the Service and is, thus, subject to NEPA, which requires federal agencies to assess the effects of their actions on the human environment by preparing an EA or an Environmental Impact Statement (in this case, an SEA; 23 CFR §§ 771.129 and 771.130) to document the potential effects of the federal action (42 USC § 4332).

Accordingly, the Service has prepared this SEA to evaluate the potential impacts associated with issuance of an amended ITP and implementation of the amended HCP and to evaluate the alternative. One reasonable alternative to the HCP Amendment Alternative was identified for this SEA: a No-Action Alternative. The consequences of these alternatives on various resources are discussed in this SEA, within the scope of the supplemental NEPA review.

1.2 PROPOSED FEDERAL ACTION

The Proposed Action is the issuance of an amended ITP by the Service pursuant to the provisions of Section 10(a)(1)(B) of the ESA, which would authorize additional incidental take of tricolored bats resulting from the operations and implementation of mitigation measures for the Project beyond the level of take authorized in the Project’s 2023 ITP. Under Section 10 of the ESA, applicants may be authorized, through issuance of an ITP, to conduct activities that may result in take of listed species, as long as the take is incidental to, and not the purpose of, otherwise lawful activities. The purpose of the Section 10(a)(1)(B) permit is to ensure that any incidental taking that might occur would be minimized and mitigated to the maximum extent practicable and would not appreciably reduce the likelihood of the survival and recovery of the species in the wild. The Applicant is seeking the amendment to the Project’s 2023 ITP based on tricolored bat fatalities documented at the Project during compliance monitoring in 2023 (see Appendix C of the amended HCP; Hale et al. 2024).

The scope of this SEA does not cover the entire Project, but rather the increase in authorized take and mitigation for tricolored bat for the purpose of an ITP amendment. The Applicant has not proposed any changes to other conservation measures or Project operations established in the Project’s 2023 HCP that would affect the other Covered Species or other environmental resources. The Service will analyze the impacts of increasing authorized take for tricolored bats and increasing mitigation on all elements of the natural and human environment that could be affected, including other wildlife species that occur within the Permit and Mitigation Areas. The Permit Area includes all leased lands associated with the Project where Covered Activities may occur and remains largely unchanged from the Final 2023 EA (Figure 1-1).

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1.3 BACKGROUND

There are no changes to the Project description (60 turbine wind project that has been operational since 2020 on 46,427 acres of privately owned land), expected operational life of the Project, permit duration, Covered Activities, or Covered Species, as described in Section 1.3 of the Final 2023 EA. The Project has been operating for one year under the 2023 HCP and the optimized smart curtailment (OSC) regime that was implemented under the 2023 ITP to reduce collision exposure for the Covered Species by at least 50% (see Section 2.2.2 of the Final 2023 EA). One year of compliance monitoring (including both operational fatality monitoring and acoustic monitoring) has been completed and reported to the USFWS (*Post-construction Monitoring Study for the Cardinal Point Wind Project – Year 1 Incidental Take Permit Report – 2023*; Hale et al. 2024). The Project will continue to use OSC to achieve the minimization goals and objectives described in Section 6.1 of the original HCP.

1.4 PURPOSE AND NEED FOR THE PROPOSED ACTION

As described in Section 1.4 of the Final 2023 EA, the Service is responsible for regulating the incidental taking of listed species under its jurisdiction in part by responding to ITP applications and requested amendments based on issuance criteria established in Section 10(a)(2)(B), as well as compliance with other applicable Federal laws and regulations. The need for the Proposed Action (i.e., issuance of an amended ITP/HCP) was prompted by the finding of five dead tricolored bats at the facility in 2023 and a cumulative take estimate of 16 tricolored bats (Hale et al. 2024). This level of tricolored bat take is approaching the authorized levels in the 2023 ITP (note the Applicant did not trigger adaptive management in Year 1, as the assessment of the median projected take is not planned to occur until Year 3, and the authorized take was not exceeded for any of the Covered Species in Year 1). While authorized take was not exceeded for any of the Covered Species in the first year of the ITP, because the cumulative take estimate of 16 tricolored bats is approaching the authorized take limit of 18 from the 2023 ITP, the Applicant decided to pursue an ITP amendment.

The Service's purpose in considering the Proposed Action is to fulfill our authority under the ESA and Section 10(a)(1)(B). More specifically, the Service's purpose for the Proposed Action is to respond to an application requesting an amended ITP, specifically for increasing incidental take authorized for the tricolored bat, pursuant to ESA Section 10(a)(1)(B) and its implementing regulations and policies. The permit decision should ensure the issuance of the amended ITP and the implementation of the amended HCP provide for the long-term conservation of the Covered Species and their ecosystems in the Permit Area. The permit decision should also ensure the issuance of the amended ITP would not appreciably reduce the likelihood of survival and recovery of the Covered Species in the wild, within the context of the amended ITP and associated amended HCP.

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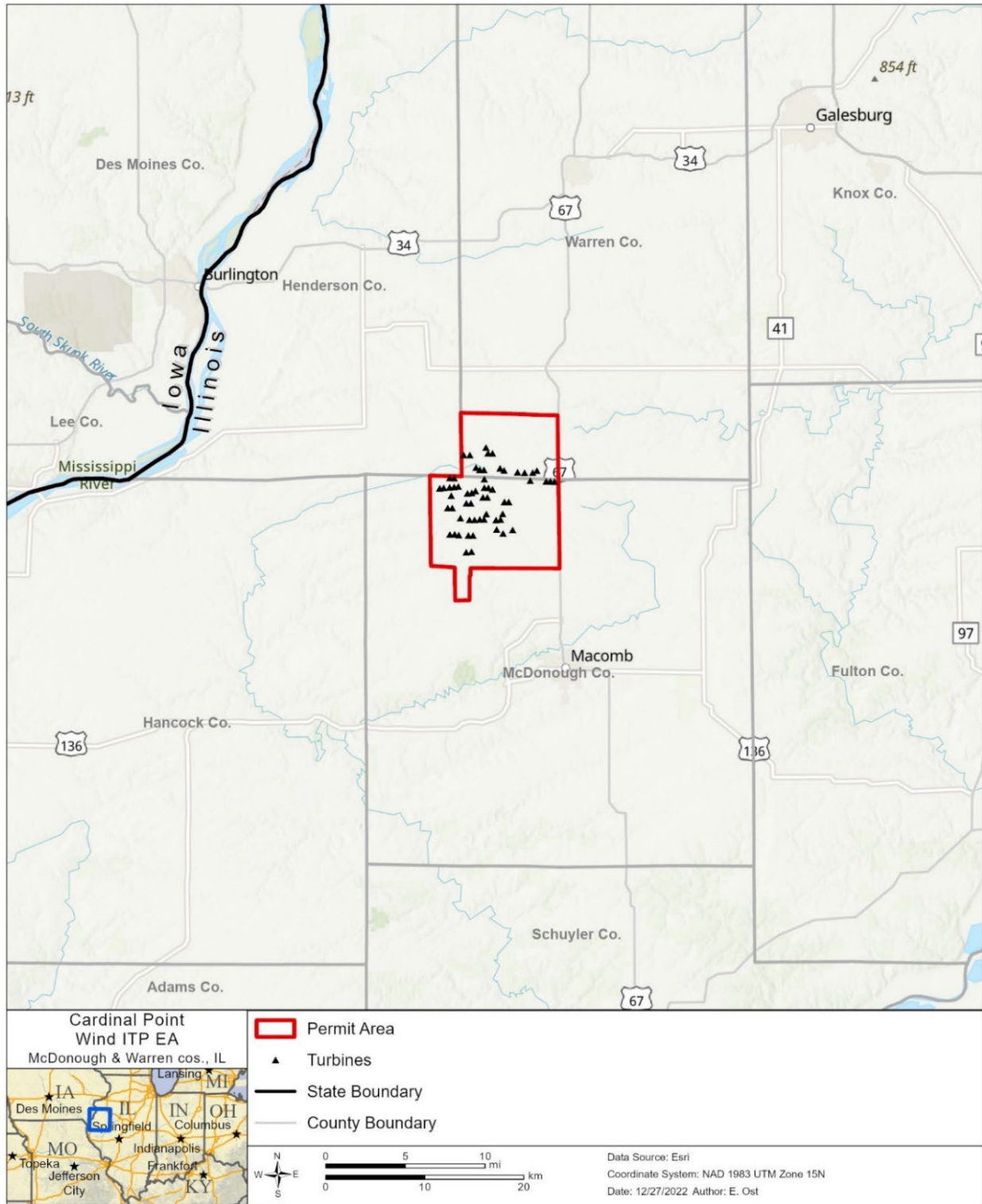


Figure 1-1. Cardinal Point Wind Project Location.

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1.5 DECISION TO BE MADE BY RESPONSIBLE OFFICIAL

The Service must decide whether to issue or deny the proposed amended ITP. The Service shall issue the amended ITP to the Applicant if the issuance criteria and implementing regulations for the ESA and general permitting are met. The issuance criteria are contained in Section 10(a)(2)(B) of the ESA and the implementing regulations for the ESA (50 CFR 17.22(b)(2) and 17.32(b)(2) and 50 CFR 222.307(c)(2)). The Service may decide to issue an amended ITP conditioned upon implementation of the amended HCP as submitted by the Applicant, or to issue an amended ITP conditioned upon implementation of the amended HCP as submitted, together with other measures specified by the Service. We are required to deny the amended ITP if these criteria are not satisfied. Cardinal Point would continue to serve as the permittee under the amended ITP (if issued) and is liable for all obligations assigned to them under the amended ITP and HCP.

1.6 REGULATORY AND POLICY BACKGROUND

There are no changes to the regulatory and policy background outlined in the Final 2023 EA (see Section 1.6 of the Final 2023 EA for the Project). The CEQ issued a proposed rule for amended NEPA regulations on July 28, 2023, and a final rule on May 1, 2024 (effective July 1, 2024); however, the Service is processing this SEA under the 2022 CEQ regulations as the ITP amendment process was initiated prior to the CEQ issuing a final rule and prior to the final rule's effective date.

2.0 ALTERNATIVES

NEPA requires that the environmental documents prepared for a proposed action discuss a range of alternatives. Therefore, this chapter describes the development of reasonable alternatives, alternatives eliminated from detailed study, and then alternatives explored and evaluated in the EA relevant to the Proposed Action (i.e., issuance of an amended ITP by the Service pursuant to the provisions of Section 10(a)(1)(B) of the ESA).

2.1 DEVELOPMENT OF ALTERNATIVES

As stated above in Section 1.1, the scope of this SEA is limited to a review of potential environmental impacts that could occur from the issuance of an amended ITP that would increase authorized take and mitigation for tricolored bats. The scope of reasonable alternatives is defined by the purpose and need for the action and guided by the goals and objectives of the acting agency. Reasonable alternatives include those that meet the purpose and need of a proposed action and are practical or feasible from both a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the Applicant.

2.2 ALTERNATIVES RETAINED FOR DETAILED ANALYSIS

The Service has determined that two alternatives fall within the scope of this SEA: the Proposed Action (HCP Amendment Alternative) and the No-Action Alternative (Table 2-1). Each alternative was evaluated for its ability to meet the purpose and need (see Section 1.4), feasibility to implement, and environmental impacts. See Section 2.0 of the Final 2023 EA for a detailed screening and development of alternatives that were conducted for the original ITP and HCP in 2023.

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Alternatives

Table 2-1. Summary of alternatives.

Alternative	Curtailment Description and Cut-in Speed ¹			Temperature Threshold ²	HCP Implemented	BBCS Implemented
	March 15 to July 14	July 15 to October 1	October 2 to November 15			
Alternative 1 (No-Action)	3.0 m/s blanket curtailment (March 15 to March 31) 6.9 m/s blanket curtailment (April 1 to July 14)	9.0 m/s blanket curtailment	3.0 m/s blanket curtailment	50°F	Yes	Yes
Alternative 2 (HCP Amendment Alternative)	3.0 m/s blanket curtailment	OSC (variable cut-in speed)	3.0 m/s blanket curtailment	Variable under the OSC	Yes	Yes

HCP = Habitat Conservation Plan; BBCS = Bird and Bat Conservation Strategy; °F = degrees Fahrenheit; OSC = optimized smart curtailment.

1. Curtailment means that turbine blades would be “feathered” or pitched into the wind at an 85-degree angle such that they spin at approximately 1–2 rotations per minute when wind speeds are below the specified cut-in speed, from sunset to sunrise. The timing of curtailment changes as part of the OSC algorithm.
2. Temperature thresholds for feathering apply from March 15 – November 15. Turbines will be freewheeling below 3.0 meters per second (m/s) from November 16 – March 14 with no temperature threshold.

2.2.1 Alternative 1: No-Action Alternative

Under the No-Action Alternative, an amended ITP would not be issued, and Cardinal Point would continue to operate the Project under the conditions of the 2023 ITP and HCP. As the cumulative take estimate of 16 tricolored bats from Year 1 is approaching the authorized take levels from the 2023 ITP/HCP (18 tricolored bats), to ensure take of Covered Species would remain below authorized levels, Cardinal Point would need to implement an avoidance regime that would make take of tricolored bats not reasonably certain to occur (should they become listed). Therefore, Cardinal Point would need to feather turbines at the Project from sunset to sunrise below wind speeds of 6.9 meters per second (m/s) during the spring migration and summer seasons (April 1 to July 14), below 9.0 m/s for the fall migration season (July 15 to October 1), and below manufacturer’s cut-in speeds (3.0 m/s) from March 15 to March 31 and October 2 to November 15 to buffer the bat active season that extends from April 1 to October 1 (Table 2-1). This curtailment regime is based on our assessment of risk at the Project, using project-specific data, as detailed below and in Section 2.2.1 of the Final 2023 EA.

Based on available acoustic and mortality data at the Project and/or from other studies, the Service finds that there is the potential for some level of collision risk throughout the bat active season from April 1 to October 1. Project acoustic data indicates a low amount of activity of Covered Species during the spring and summer, while spring and summer mortality data from other studies provides evidence that mortality of Indiana bats, northern long-eared bats, and little brown bats could occur during the same period, although at substantially lower rates than during fall migration (Western EcoSystems Technology, Inc. [WEST] 2021, Pruitt and Reed 2022; Hale et al. 2024). Project-specific acoustic and mortality data indicates both high activity levels and risk of mortality of Covered Species during the fall migration period at high wind speeds (see Sections 2.1 and 3.5.1.3 of the Final 2023 EA).

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At this specific Project, the Service is currently assuming operational curtailment with the elevated cut-in speeds noted above and in Table 2-1 for the No-Action Alternative would be sufficient to make take of northern long-eared bats and tricolored bats not reasonably certain to occur. Take of little brown bats is also not expected but is not currently prohibited based on their listing status. However, a small amount of Indiana bat take may still occur under operational curtailment up to 9.0 m/s in the fall (see below). We base this assumption on an analysis of fall 2022 Project wind speed data and bat acoustic data (an indication of bat activity) and the likelihood that spring and summer collision risk at this Project would be lower than risk in the fall. Although Indiana bats have been taken at 6.9 m/s in the fall at this Project, 6.9 m/s has typically been found sufficient to avoid take at other wind facilities with lower risk. We also know that bat behavior during spring migration and the summer is different than in the fall, and likely results in a lower risk of turbine collisions. Bats that would be present in the Permit Area in spring are expected to be migrating to summer habitat. Bats from spring migration studies have migrated more slowly than in the fall, and made periodic stops to forage on their way to their summer habitat (Roby et al. 2019). Therefore, we are assuming that bats, including Indiana bats, are less likely to migrate at higher wind speeds during the spring, as this may be more energetically demanding after hibernation.

We also assume that 6.9 m/s would be a sufficient cut-in speed for avoidance in the summer given a lower collision risk based on minimal suitable summer habitat near Project turbines (see Section 3.5.1 of the Final 2023 EA), the low pre- and post-construction bat acoustic activity detected in the summer (Stantec 2010; Hale et al. 2024; also see Section 3.5.1.3 of the Final 2023 EA), and the likelihood that summer behavior puts bats at a lower collision risk than fall migration behavior, as indicated by seasonal bat mortality studies (WEST 2021). In conclusion, while spring and summer risk is likely low, there is currently insufficient Project-specific data available to indicate whether spring and summer bat mortalities could occur at the Project. While the HCP Amendment Alternative assumes spring and summer curtailment beyond the manufacturer's cut-in speed would not be needed, adaptive management measures could be implemented in order to ensure permitted take is not exceeded should spring or summer mortalities occur (see Sections 2.2.2 and 2.2.3 of the Final 2023 EA). However, under the No-Action Alternative, no additional tricolored bat take would be permitted beyond what was authorized in the Final 2023 EA. Therefore, including raised curtailment during the spring and summer is a conservative approach to ensure take of tricolored bat is avoided, in lieu of additional information.

As noted above, a high fall mortality risk to the Covered Species is more certain, with an Indiana bat mortality occurring at the Project in August of 2022 under a curtailment regime of 7.5 m/s. Based on an analysis of the fall 2022 bat acoustic data collected at the Project (WEST, unpublished data, 2023), blanket curtailment below 9.0 m/s during fall migration, when Covered Species risk is expected to be highest, would avoid over 90% of little brown bat and tricolored bat activity and approximately 76% of Indiana bat activity (no northern long-eared bat calls were recorded in fall 2022). Also, the Service currently has no records of any of these species being taken at wind speeds of 9.0 m/s. Therefore, we believe that feathering turbines below 9.0 m/s during the fall migration would make take of tricolored bats, little brown bats, and northern long-eared bats not reasonably certain to occur. While some level of Indiana bat take would still be expected when turbines are feathered below wind speeds of 9.0 m/s, this level of take would be expected to be well below the authorized levels outlined in the 2023 ITP/HCP. We note here that the Service has released draft guidance related to avoidance measures for tricolored bats that differ from our assumptions here. Because we have site-specific post-construction acoustic and fatality data at this project to inform our No Action Alternative, we have determined that this draft guidance is not applicable in this specific location.

While blanket curtailment below 9.0 m/s in the fall would avoid over 90% of non-covered bat activity and curtailment below 6.9 m/s in the spring and summer is also likely to reduce non-covered bat fatality risk,

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fatalities of non-covered species could still occur under the No-Action Alternative since they generally have much higher mortality rates and are likely able to forage at higher wind speeds than the Covered Species (see Section 3.5.1.1 of the Final 2023 EA). Because non-covered bat species are not protected under the ESA, fatalities could still occur under a No-Action Alternative without penalty.

Under this alternative, the Project would continue to conduct fatality monitoring as outlined in the 2023 ITP/HCP. If additional Indiana bat, northern long-eared bat, or tricolored bat carcasses are found resulting in exceedance of the authorized take levels in the 2023 ITP/HCP, the Project would shut the turbines down completely at night unless additional information were to be collected regarding an alternative cut-in speed that was protective of listed bat species. If additional data indicates changes in seasonal risk at the Project or if new technologies or operational strategies are developed over the life of the Project that are demonstrated to be equally as effective at avoiding take of the Covered Species new technologies or revised operational strategies could be implemented at the Project through adaptive management, following review and approval by the Service. The same would apply to little brown bats should this species become listed in the future.

If take should still occur with the avoidance measures described above, the Applicant would immediately contact the Service to discuss additional options for avoidance or the renewed need for amending the ITP. Should other bat species become listed at some point during the operational life of the Project, the Applicant would need to reinitiate consultation with the Service to seek take coverage for those species.

2.2.2 Alternative 2: Habitat Conservation Plan Amendment Alternative

Under the HCP Amendment Alternative, the Service would issue an amended ITP to the Applicant authorizing additional tricolored bat take for the Project based on updated Evidence of Absence model runs incorporating the 2023 compliance monitoring data for tricolored bats (see Section 5.1 of Appendix B of the amended HCP). The Applicant would continue to operate the Project while conducting research to identify a long-term operational smart curtailment strategy that would adequately minimize take of Covered Species, as described further below. A smart curtailment regime involves predictively curtailing turbines during periods of expected high bat activity based on bat acoustics, weather data, and power data collected at the Project. The HCP Amendment Alternative would minimize take with its operational strategy, mitigate the effects of take, and conduct monitoring and adaptive management, as described below. The permit term remains unchanged at six years, beginning in 2023 with five years remaining in the permit term.

Minimization through Operations

Cardinal Point would continue to implement and test an operational strategy (via OSC) during the fall migration season (July 15 to October 1) that minimizes Covered Species' collision risk (as approximated by acoustic activity) by at least 50% compared to what would have been approximated under non-curtailed operations, while also maintaining take within permitted levels during the remainder of the 6-year permit term. Different operational strategies may be implemented in different years depending on monitoring results, as described in Section 2.2.2 of the Final 2023 EA and in Section 6.2 and Appendix C of the amended HCP. For the second year of the ITP (2024), the Applicant will implement OSC at the Project according to a study design based on the results of Year 1 and in coordination with the USFWS, with the goal of selecting the best OSC approach for implementation (and potential continued refinement) in the final four years of the ITP. A summary of the minimization plan for years 2–6 is provided below, and additional details can be found in Section 6.2 and Appendix C of the amended HCP.

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Early and Late Season Curtailment

- All Years
 - All turbines would be feathered below 3.0 m/s from sunset to sunrise at temperatures greater than 50 degrees Fahrenheit (°F) from March 15 to July 14 and October 2 to November 15.

Mid-Season Curtailment (Fall Migration)

- Permit Year 2 (2024)
 - The chosen OSC strategy will be based on data from 2022 and 2023, in coordination with the USFWS. Per the previous fatality monitoring results (including the 2023 acoustic and fatality monitoring results summarized in Section 3.5.2 of the amended HCP), OSC will be implemented from July 15 – October 1, 2024.
- Permit Year 3 (2025)
 - The chosen OSC strategy, based on data from 2022, 2023, and 2024 and determined in coordination with the Service, would be implemented at all 60 turbines.
- Permit Years 4–6 (2026–2028)
 - The chosen OSC strategy would be implemented at all 60 turbines, unless data indicates that adjustments are needed. The Applicant would continue to monitor for take compliance and adjust conservation measures as indicated by adaptive management.

Measures to Mitigate the Impact of Taking

There are no changes to the approach to mitigate the impact of Covered Species take for the Project (see Section 2.2.2.2 and Figure 2-1 of the Final 2023 EA). However, the increase in authorized take for tricolored bat would involve up to an additional 16 acres of forested habitat being protected or restored as upfront mitigation for the Covered Species (see Section 6.3 and Appendix C of the amended HCP).

Monitoring and Adaptive Management

There are no changes to the proposed monitoring and adaptive management framework outlined in the 2023 ITP/HCP (see Section 2.2.2.3 of the Final 2023 EA and Sections 6.4 and 6.5 of the amended HCP).

2.3 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

One of the HCP's biological goals and objectives is to test emerging minimization technology by conducting an experiment to compare OSC and blanket curtailment (Goal/Objective 3; see Section 6.1 of the Amended HCP). To help maintain the integrity of the Covered Species populations in Illinois by minimizing mortalities in the Permit Area, the HCP set an annual 50% collision risk reduction target (compared to non-curtailed operations) while the experiment is ongoing during the six-year Permit Term (Goal/Objective 1). A more restrictive alternative to the proposed HCP was analyzed in the Final 2023 EA (Alternative 3). This alternative would have struck the experimental aspect of the proposed operational regime and implemented a single curtailment regime that feathered turbines below wind speeds of 7.0 m/s for the fall migration season from July 15 – October 1, and below the manufacturer's cut-in speed (3.0 m/s) from March 15 – July 14 and October 2 – November 15 (see Section 2.2.3 of the Final 2023 EA). However, this alternative was not selected as the Preferred Alternative because the Service determined that the HCP Alternative would allow the Project to generate more clean energy while

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providing greater mitigation benefit to offset the loss of Covered Species and an opportunity for research and improved understanding of Covered Species activity and risk at wind turbines (see Section 5.0 of the Final 2023 EA).

Given the unanticipated levels of tricolored bat fatalities documented at the Project in 2023, the Service again considered whether a more restrictive alternative should be analyzed in this SEA to ensure the issuance of the amended ITP would not appreciably reduce the likelihood of survival and recovery of the tricolored bat, one of the purposes of the Service's Proposed Action (see Section 1.4). In considering such an alternative, the Service notes that the documented fatalities of tricolored bats have been highly variable at the Project. This variability includes no tricolored bat fatalities detected during post-construction fatality monitoring in the first three years of Project operation, even in 2020 when the Project was operating under a less restrictive curtailment regime than in 2023 (see Section 2.1 of the Final 2023 EA), when five tricolored bat carcasses were discovered (Hale et al. 2024). Therefore, given the variability of tricolored bat fatalities documented at the Project, the short-term nature of the ITP, the uncertainty around the effectiveness of an increased risk reduction target, and to support the long-term conservation of the Covered Species through continued research, a more restrictive alternative was eliminated from further consideration.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 RESOURCES SCREENED FOR CHANGES AND IMPACTS

The affected environment is the area and its resources (i.e., biological, physical, socioeconomic) potentially impacted by the Proposed Action and the No-Action Alternative. The affected environment includes those settings where any Covered Activities (operations and mitigation) would occur, and therefore the NEPA Project Area remains unchanged from the Final 2023 EA, and includes the site of Project operations (Permit Area) and habitat Mitigation Area(s); see Section 3.1.1 of the Final 2023 EA for an overview of the NEPA Project Area.

The changes to the 2023 Proposed Action (i.e., increase in authorized take for tricolored bats and an increase in overall mitigation acreage) were reviewed to determine impacts to the same environmental resources analyzed for the Final 2023 EA: vegetation, avian resources, bat resources, and air quality and climate. Because the Proposed Action does not cover Project design or construction, the Covered Activities under the alternatives are unlikely to have significant effects to insects and non-volant wildlife (including state-listed as threatened and endangered species that may occur within the Permit Area (i.e., the regal fritillary [*Speyeria idalia*] and lined snake [*Tropidoclonion lineatum*]; Illinois Department of Natural Resources 2023), geology and soils, water resources, socioeconomics, environmental justice, land use, visual resources, cultural resources, transportation, and communications. Hence, our review for this SEA does not extend to include detailed analyses of these resources.

The environmental consequences sections analyze the environmental impacts of each of the alternatives analyzed in this SEA. In accordance with 40 CFR §§ 1502.16 and 1508.1, we analyzed direct, indirect, and cumulative impacts on the environment. The analysis of direct, indirect, and cumulative effects in this SEA uses the same approach as the Final 2023 EA (see Section 3.2 of the Final 2023 EA for additional details). Environmental trends and past, present, and reasonably foreseeable actions in the analysis area include other wind energy development, other land development (e.g., industrial, residential), climate

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change, white-nose syndrome (WNS), and conservation projects, as described in Section 3.2.1 of the Final 2023 EA.

The Service determined that the issuance of the 2023 ITP would result in Covered Species take but would not jeopardize the continued existence of the Covered Species. Furthermore, the Service determined that the issuance of the 2023 ITP would have no effect on other federally listed species (USFWS 2023). The Service has reinitiated intra-service Section 7 consultation/conference for the tricolored bat to determine if and how issuance or denial of the permit amendment would affect federally listed, proposed, and candidate species. A final impact determination will be made through the USFWS Section 7 intra-agency consultation/conference process, which is ongoing as of the date of this document and will be presented in the Service’s Biological Opinion for the SEA.

This section provides a description of the affected environment, the environmental consequences, and the cumulative impacts that could result from implementation of the Proposed Action. Table 3-1 identifies resources considered for detailed analysis. Not all of the resources analyzed in the Final 2023 EA would be affected by the Proposed Action because there would either be no impacts or negligible impacts on the resource. Because these resources are not impacted by the revisions to the proposed Project, they have not been evaluated further.

Table 3-1. Summary of resources screened for detailed analysis.

Resource	Changes to the Affected Environment Compared to the Final 2023 EA	Potential Impacts to Resources from Changes to the Proposed Action (Habitat Conservation Plan Amendment Alternative)¹
Vegetation	No Changes	<p>The Proposed Action would involve up to an additional 16 acres of forested habitat being protected or restored as upfront mitigation for the Covered Species; these additional 16 acres were already analyzed in the final 2023 EA, in the form of a potential mitigation true-up, and therefore no additional beneficial effects to forest vegetation would occur beyond what was analyzed in the Final 2023 EA, if no true-up is triggered through adaptive management.</p> <p>However, should a mitigation true-up occur up to the authorized take levels under the Proposed Action, 16 additional acres of forested habitat would be protected or restored as true-up mitigation beyond what was analyzed in the Final 2023 EA (see Section 3.2 of the Final 2023 EA). These additional 16 acres represent 0.004% of the total forested area (387,893 acres [NLCD 2019]) within the lower Illinois watershed (HUC-8 07130011) in which the proposed Mitigation Area would be located. Therefore, additional beneficial impacts to forested vegetation beyond what was analyzed in the Final 2023 EA would be minor, and vegetation impacts are not analyzed further in the SEA.</p>

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Table 3-1. Summary of resources screened for detailed analysis.

Resource	Changes to the Affected Environment Compared to the Final 2023 EA	Potential Impacts to Resources from Changes to the Proposed Action (Habitat Conservation Plan Amendment Alternative)¹
Avian Resources	Minor changes: 90 bird carcasses were recorded during the 2023 post-construction monitoring surveys (beyond the 4, 41, and 27 bird carcasses recorded in 2020, 2021, and 2022, respectively); no federally or state-listed or USFWS Birds of Conservation Concern were recorded as fatalities in 2024 (Hale et al. 2024).	The Proposed Action would not result in any additional impacts than those previously addressed in the Final 2023 EA. Based on the 2023 fatality data, 90 fatalities found at a 150-MW Project results in rough fatality estimates of 0.6 bird/MW/year. Although this range is likely low (i.e., it does not take into account bias correction factors such as searcher efficiency and carcass persistence), it is still well within the range of other wind energy facilities in the state and USFWS Region 3 (0.03–15.92 birds/MW/year) and within the scope of what was analyzed in the Final 2023 EA. Additional beneficial impacts to forest birds from the additional 16 mitigation acres would be minor. Therefore, impacts to avian resources are not analyzed further in this SEA.
Bat Resources	Moderate changes: see Section 3.2 of the SEA, below.	Impacts from the Proposed Action are outlined in Section 3.2 of the SEA, below.
Air Quality and Climate	No Changes	The Proposed Action would not result in any additional impacts than those previously addressed in the Final 2023 EA. Therefore, impacts to air quality and climate are not analyzed further in this SEA.

¹ This table analyzes potential impacts to resources from implementation of the Habitat Conservation Plan Alternative; however, the No-Action Alternative would also result in no new impacts to vegetation, avian resources, or air quality and climate. Furthermore, the No-Action Alternative would not result in any additional impacts to bats beyond what was analyzed for the Proposed Action in the Final 2023 EA.

EA = Environmental Assessment; MW = megawatt; NLCD = National Land Cover Database; SEA = supplemental Environmental Assessment; USFWS = U.S. Fish and Wildlife Service.

3.2 BAT RESOURCES

This section outlines any changes or additions to the affected environment and environmental consequences for bat resources beyond what was analyzed in the Final 2023 EA; see Section 3.5 of the Final 2023 EA for a description of bat resources in general and the existing conditions for bats within the Permit Area.

3.2.1 Affected Environment

3.2.1.1 Status and Environmental Trends of Non-Covered Species

There are no changes to the bat species or trends for the five non-covered species that could occur in the Permit Area as described in Section 3.5.1.1 and Table 3-6 of the Final 2023 EA. However, one additional non-covered bat species, the Seminole bat (*Lasiurus seminolus*) also may occur within the Permit Area, based on 2023 post-construction monitoring data. Newer research suggests that Seminole bats may be migrating further and inhabiting a wider habitat range due to climate change. Seminole bats often roost in pines (*Pinus* sp.) and other tree foliage but can inhabit a range of forest ecosystems. They are active year-round and only hibernate for short periods under leaf litter when temperatures drop below 40°F. Recent records are showing long-distance migration that was not recorded historically (Perry 2018).

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3.2.1.2 Status and Environmental Trends of Covered Bat Species, Including Threatened and Endangered Bats

The listing status and environmental trends for the four Covered Species has not changed (see Section 3.5.1.2 of the Final 2023 EA).

3.2.1.3 Occurrence of Bat Resources in the Permit Area

This section summarizes the new 2023 data for the Covered Species and non-covered bat species within the Permit Area. The data is summarized below in Table 3-2 and includes Seminole bats found outside their historic range (see full data in Post-Construction Monitoring Study for the Cardinal Point Wind Project: Year 1 Incidental Take Permit Report and Section 3.2.1.1, above). There are no changes to data collected before 2023 that was summarized in Section 3.5.1.3 of the Final 2023 EA.

Table 3-2. Summary of pre-construction and post-construction bat surveys at the Cardinal Point Wind Project.

Survey	Summary	HCP Section and Citations
Pre-construction Acoustic	<ul style="list-style-type: none"> • August 18 to October 19, 2009, and April 5 to July 8, 2010 • 1,976 bat calls recorded during stationary surveys and 26 bat calls recorded during mobile surveys representing both high- and low-frequency species. • Of the 105 bat calls recorded within the rotor-swept zone, only 11 were high-frequency calls (<i>Myotis</i> or <i>Perimyotis</i>). • The Covered Species may have been present, due to detection of high-frequency calls that were not identified to species; non-covered bat species were identified as hoary, big brown, eastern red, and silver-haired bats. • Bat activity occurred in the spring, summer, and fall, with a peak in the fall. The highest rate of activity was for low-frequency bats at the 2-meter height in fall (19.5 calls recorded per detector per night). 	HCP Section 3.5.1 (Stantec 2010, 2020)
Post-construction Acoustic	<ul style="list-style-type: none"> • July 15 to September 30, 2022, and March 10 to November 2, 2023 • Eighteen acoustic detectors deployed at sixteen locations throughout the Permit Area in both 2022 and 2023 (six nacelle-mounted and 12 ground-based detectors). • Bat biologist confirmed the presence of Indiana, little brown, and tricolored bat at the Project in both 2022 and 2023. No northern long-eared bat calls were detected in either year. Non-covered species calls were not reported by species. • In both 2022 and 2023, all-bat activity was elevated between mid-July and the end of August. However, while in 2022 all-bat heightened activity persisted through late August, the highest all-bat activity levels in 2023 occurred between July 25 and August 12. Covered Species activity patterns generally followed all-bat activity patterns in both years.. 	Hale et al. 2024

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Table 3-2. Summary of pre-construction and post-construction bat surveys at the Cardinal Point Wind Project.

Survey	Summary	HCP Section and Citations
Post-construction Mortality	<ul style="list-style-type: none"> • Carcass searches were conducted at road and turbine pad plots from July 15 to October 15, 2020; July 12 to October 15, 2021; August 1 to October 13, 2022; and July 15 to October 15, 2023 • 1,322 bat carcasses were found, including five tricolored bats in 2023; three Indiana bats found in 2021; one Indiana bat found in 2022; and eight Indiana bats found in 2023 (<1%). All five non-covered species were found in 2020, 2021, and 2023, however, no evening bats were found in 2022. Five Seminole bats were also found in 2023 at the Project, which is outside their historic range. A total of 1,305 non-covered species have been found at the Project (99%) (see Table 3-3). • No northern long-eared bat or little brown bat fatalities have been recorded at the Project. 	<p style="text-align: center;">HCP Section 3.5.2</p> <p style="text-align: center;">(Stantec 2021; Chodachek et al. 2022, 2023; Hale et al. 2024)</p>

HCP = Habitat Conservation Plan; Stantec = Stantec Consulting Services, Inc.; WEST = Western EcoSystems Technology, Inc.

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Table 3-3. Results of post-construction monitoring at the Cardinal Point Wind Project by species and year.

Species	Bat Carcasses per Year					Percent Composition ⁵
	Fall 2020 ¹	Fall 2021 ²	Fall 2022 ³	Fall 2023 ⁴	Total	
Non-covered Species						
Eastern red bat	97	123	20	572	812	61
Silver-haired bat	20	41	2	98	161	12
Hoary bat	38	40	6	90	174	13
Big brown bat	14	14	2	40	70	5
Evening bat	7	2	0	26	35	3
Unidentified Lasiurus bat	0	0	0	23	23	2
Eastern red or Seminole bat	0	0	0	16	16	1
Unidentified non-myotis	0	0	0	8	8	<1
Seminole bat	0	0	0	5	5	<1
Unidentified	0	0	0	1	1	<1
Covered Species						
Indiana bat	0	3	1	8	12	<1
Tricolored bat	0	0	0	5	5	<1
Little brown bat	0	0	0	0	0	0
Northern long-eared bat	0	0	0	0	0	0
Total⁶	176	223	31	892	1,322	100

1. Stantec 2021. Note: six of the fatalities were found incidentally and were not included in subsequent analysis; turbines were freewheeling at manufacturer’s cut-in speed of 3.0 m/s (i.e., no curtailment).

2. Chodachek et al. 2022. Note: eight of the fatalities were incidental and were not included in subsequent analysis; turbines were feathered up to 4.0 m/s, 6.9 m/s, and 7.5 m/s for portions of the 2021 fall season.

3. Chodachek et al. 2023. Note: 10 of the fatalities were incidental and were not included in subsequent analysis; turbines were feathered up to 7.5 m/s.

4. Hale et al. 2024. Note: 58 of the fatalities were incidental and were not included in subsequent analysis; 20 turbines were feathered up to 5.0 m/s, 20 turbines were feathered up to 7.5 m/s, and 20 turbines were operating under optimized smart curtailment.

5. The sum may not equal the addends due to rounding.

6. Search effort was highest in 2023, followed by 2021, then 2022, and lowest in 2020.

3.2.2 Environmental Consequences

3.2.2.1 Impact Criteria

The following sections analyze potential impacts of each alternative on both Covered Species and non-covered bat species. Major impacts may occur to bats should implementation of an alternative result in a) observed Project mortality rates greatly exceeding the estimated rate for a wind project in the region, b) substantial loss or degradation of habitat, or c) substantial change in habitat conditions producing indirect effects that result in additive reductions in naturally occurring populations.

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Major impacts to covered bats could occur should implementation of an alternative result in naturally occurring populations reduced in numbers below levels for maintaining viability at the local or regional level, or substantial loss or degradation of habitat that causes naturally occurring populations to be reduced in numbers below levels for maintaining viability at local or regional levels.

3.2.2.2 Direct and Indirect Effects to Bats

Disturbance/Displacement

The impact analysis of disturbance/displacement of bats at wind facilities has not changed since the original analysis in Section 3.5.2.2 of the Final 2023 EA.

Turbine Related Fatality

Estimated turbine-related fatality for northern long-eared bats and little brown bats would remain unchanged from prior analysis in Section 3.5.2.2 of the Final 2023 EA. The HCP Amendment Alternative (i.e., an increase in authorized take for tricolored bat) would result in additional impacts to tricolored bats beyond what was analyzed in the Final 2023 EA. The No Action Alternative (avoidance for tricolored bats), would apply a lower cut-in speed than that of the No Action Alternative in the Final 2023 EA. This would avoid mortality of tricolored, northern long-eared, and little brown bats, but could result in take of Indiana bats and increased mortality of non-covered bats. Because fatality rates for northern long-eared bats and little brown bats have not changed from the Final 2023 EA for either alternative, those species are not included in the following sections.

Fatality estimates for the two alternatives were calculated for this analysis, along with a “No Operational Adjustment” scenario that assumes no curtailment or feathering below the manufacturer’s cut-in speed (3.0 m/s) as a basis for comparison (Tables 3-4 and 3-5). Details on impact analysis by alternative, as well as regional impacts associated with turbine fatalities, are provided in the following sections.

Table 3-4. Summary of estimated fatalities for Covered Species by alternative on an annual basis and for the 6-year permit duration.

Species	No Operational Adjustment Scenario ¹		Alternative 1: No-Action Alternative ²		Alternative 2: HCP Amendment Alternative ³	
	Annual	6 Years	Annual	6 Years	Annual	6 Years
Indiana Bat Fatality Estimate	79.82	479	19.16	115	39.91	240
Tricolored Bat Fatality Estimate	50	300	0	0 (16 in Year 1)	25	150
Percent Reduction from No Operational Adjustment Scenario			76–100		50	

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Table 3-4. Summary of estimated fatalities for Covered Species by alternative on an annual basis and for the 6-year permit duration.

Species	No Operational Adjustment Scenario ¹		Alternative 1: No-Action Alternative ²		Alternative 2: HCP Amendment Alternative ³	
	Annual	6 Years	Annual	6 Years	Annual	6 Years

1. This is not an alternative under consideration but is included in the analysis for comparison. Take rates for the No Operational Adjustment scenario were calculated based on the assumption that the authorized take rates from the HCP equate to a 50% reduction in fatality rate from non-curtailed operations for each of the Covered Species.
2. Take rates for the No-Action Alternative assume full avoidance for tricolored bat and a 76% reduction in Indiana bat take from the no operational adjustment scenario based on 2022 acoustic data.
3. Take rates for the Habitat Conservation Plan (HCP) Amendment Alternative are the authorized rates from the amended HCP.

Note: numbers in bold text are changed from the Final 2023 EA, and are the focus of the re-analysis in this SEA.

Table 3-5. Summary of estimated non-covered bat fatalities by alternative on an annual basis and for the 6-year permit duration.

Species	No Operational Adjustment Scenario ^{1,2}		Alternative 1: No-Action Alternative ²		Alternative 2: HCP Amendment Alternative ²	
	Annual	6 Years	Annual	6 Years	Annual	6 Years
Total Bats	8,045	48,272	1,201	7,208	4,479	26,877
Percent Reduction from No Operational Adjustment Scenario ³			17– 91%		17–50%	

1. This is not an alternative under consideration but is included in the analysis for comparison. Fatality estimates for the No Operational Adjustment scenario are based on the estimated total bat fatality rate for the Project from the 2020 post-construction fatality monitoring study (Stantec Consulting Services Inc. 2021).
2. The annual non-covered bat fatality estimates were calculated by taking the total bat fatality estimate for the 2020 fall season (Stantec Consulting Services Inc. 2021), and extrapolating the fatality estimate for each season using the seasonal fatality rate proportions from the MidAmerican post-construction mortality monitoring dataset (MidAmerican 2019).
3. The percent reductions in fatality estimates expected under the various feathering regimes were then applied seasonally based on the equivalent reduction in bat acoustic calls from the fall 2022 Project-specific acoustic data. For the No-Action Alternative, we assumed a 66% reduction during the spring and summer (6.9 meters per second [m/s] cut-in speed), a 91% reduction during the fall (9.0 m/s cut-in speed), and a 17% reduction for the remainder of the season (3.0 m/s cut-in speed). For the Habitat Conservation Plan (HCP) Amendment Alternative, we assumed a 50% reduction in the fall when operational smart curtailment would be implemented and a 17% reduction for the remainder of the season (3.0 m/s cut-in speed).

Note: numbers in bold text are changed from the Final 2023 EA, and are the focus of the re-analysis in this SEA.

No-Action Alternative

Under the No-Action Alternative, we assume full avoidance (i.e., no take) for tricolored bat for the remaining five years of the permit and 16 tricolored bats taken in Year 1; and a 76% reduction in Indiana bat take from the no operational adjustment scenario based on 2022 acoustic data (Table 3-4). Indiana bat take under the No-Action Alternative would be less than under the HCP Amendment Alternative; because the Applicant already obtained sufficient take coverage for Indiana bat under the 2023 HCP/ITP, the smaller amount of Indiana bat take that would be expected to occur under the No-Action Alternative

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would be within the authorized take limits from the 2023 HCP/ITP, and full avoidance for this species would not be needed.

Fatality estimates for non-covered bat species under the No-Action Alternative are assumed to be greater than zero since fatalities could occur at higher wind speeds than Covered Species (see Sections 2.1). The Service has determined that the level of operational minimization under the No-Action Alternative is expected to reduce non-covered bat fatality rates by 66% during spring migration and summer when turbines are feathered below 6.9 m/s, 91% during fall migration when turbines are feathered below 9.0 m/s, and 17% during the remainder of the season when turbines are feathered below 3.0 m/s based on the equivalent percent reductions in bat acoustic calls at the Project in 2022. The calculated reduction in fatalities is based on the assumption that the number of acoustic calls recorded at different wind speeds is directly proportional to the number of fatalities that would occur. This assumption may be supported by the 82% reduction in non-covered bat fatalities between 2020 (when turbines were freewheeling at manufacturer's cut-in speed of 3.0 m/s) and 2022 (when turbines were feathering under 7.5 m/s; see Table 3-5). This reduction is potentially more notable given that fewer non-covered bats were found despite the higher search effort in 2022. This field of study is evolving as the use of acoustics at wind turbines expands. Therefore, we acknowledge here that this assumption may be refined in future NEPA and HCP analyses, but that this correlation represents the best available information at this time.

The annual non-covered bat fatality estimate under the No-Action Alternative was calculated by taking the total bat fatality estimate for the 2020 fall season (Stantec Consulting Services Inc. 2021), and extrapolating the fatality estimate for each active season using the seasonal fatality rate proportions from the MidAmerican Energy Company (MidAmerican) post-construction mortality monitoring dataset (MidAmerican 2019). The percent reductions in fatality estimates expected under the three feathering regimes were then applied seasonally based on the equivalent reduction in bat acoustic calls from the fall 2022 Project-specific acoustic data, as summarized above. Based on these calculations, an estimated 1,201 fatalities of non-covered bats are expected annually (7,208 bats over six years) under the No-Action Alternative (Table 3-5).

Because additional take of tricolored bats is not reasonably certain to occur under the No-Action Alternative, no ITP amendment would be issued, and no additional mitigation would be implemented. If a tricolored bat take were detected (in any season), the Project would implement adaptive management measures (e.g., turbines fully shut down at night) to avoid future take and/or further coordinate with the Service.

No Operational Adjustment

Covered Species take rates for the No Operational Adjustment scenario were calculated by doubling the take rates from the HCP Amendment Alternative (see below), based on an assumption that the authorized take equates to a 50% reduction in fatality rate from non-curtailed operations for each of the Covered Species compared to a No Operational Adjustment.

Conversely, as stated above for the No-Action Alternative, the non-covered species fatality estimate for the No-Operational Adjustment scenario was calculated first from the all-bat fall season fatality estimate from the Project's 2020 fatality data (when turbines were freewheeling under 3.0 m/s). No Covered Species carcasses were found in the 2020 fatality data; therefore, the all-bat fatalities equate to non-covered species fatalities. The fatality estimate for each active season was calculated using the seasonal fatality rate proportions from the MidAmerican post-construction mortality monitoring dataset (MidAmerican 2019).

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HCP Amendment Alternative

Take requests for Indiana bats, northern long-eared bats, and little brown bats remain unchanged from the 2023 HCP/ITP. Under this alternative, the authorized take of the tricolored bat would be limited to 25 tricolored bats per year (150 bats over the 6-year permit term; see Table 3-4).

A summary of expected non-covered bat fatalities is provided in Table 3-5. Up to 4,479 fatalities of non-covered bats would be expected annually, totaling up to 26,877 fatalities over the 6-year permit term. If adaptive management measures should need to be implemented to further reduce Covered Species fatalities, the non-covered bat fatality rates would also likely decrease. The Service would consider potential impacts to non-covered bats that could occur with the implementation of proposed adaptive management measures, and approval would depend on the outcome of that evaluation.

Regional Impact of Turbine Fatality

Based on take estimates provided in Table 3-4, the annual percent impact for each species relative to the species' recovery unit or state population estimates are presented in Table 3-6.

Table 3-6. Impact of annual take at the Cardinal Point Wind Project under each alternative relative to the state or regional population of each Covered Species.

Species Population ¹	Annual Take Percentage of Species' Population		
	No Operational Adjustment Scenario ²	Alternative 1: No-Action Alternative	Alternative 2: HCP Amendment Alternative
Percent of Sodalis Nature Preserve Population of Indiana Bat (212,000)	0.038	0.009	0.019
Percent of Tricolored Bat Population within a 350-mile migration buffer (9,900)	0.505	0.16 (in Year 1) 0 (remaining 5 years)	0.252

¹ See Section 3.2.1.2 and associated footnotes for explanation on population estimates.

² This is not an alternative under consideration but is included in the analysis for comparison.

HCP = Habitat Conservation Plan.

Note: numbers in bold text are changed from the Final 2023 EA, and are the focus of the re-analysis in this SEA.

Effects of Maintenance and Monitoring

Maintenance activities would be required to ensure the safety and operability of the Project under both alternatives being considered. These activities and their effects have not changed from Section 3.5.2.2 of the Final 2023 EA.

Effects of Mitigation

Under both the No-Action Alternative and the HCP Amendment Alternative, forested summer and/or winter habitat mitigation would be still implemented in the Lower Illinois watershed. Under the HCP Amendment Alternative, up to an additional 16 acres of forested habitat may be protected or restored to continue to fully offset the additional tricolored bat take that would be authorized by an amended ITP. These additional 16 acres represent 0.004% of the total forested area (387,893 acres [National Land

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Cover Database 2019]) within the lower Illinois watershed (HUC-8 07130011) in which the proposed Mitigation Area would be located. Therefore, there are effectively no changes to the effects of mitigation on both the Covered Species and non-covered bat species beyond what was analyzed in the Final 2023 EA, because Covered Species take would be fully offset through mitigation under either alternative and the additional 16 acres of forested habitat that may be protected or restored under the HCP Amendment Alternative would provide negligible to minor additional benefits to the non-covered bat species.

Cumulative Effects to Bats

The Final 2023 EA included a reasonable assessment of other past, present, and reasonably foreseeable future cumulative effects to bats including wind energy development, climate change, the spread of WNS, and conservation projects. The Service has concluded that the cumulative effects of climate change, the spread of WNS, and conservation projects on bat species will not change from those analyzed in the Final 2023 EA. Therefore, the scope of the analysis in this SEA is limited to the cumulative effects from wind energy development.

Cumulative effects to northern long-eared bats and little brown bats would remain unchanged from what was analyzed in Section 3.5.2.2 of the Final 2023 EA. To assess cumulative effects on Indiana bats, tricolored bats, and non-covered bats under the No-Action Alternative and HCP Amendment Alternative, we used the analysis areas defined in Section 3.5.1 of the Final 2023 EA; namely, the Ozark Central Recovery Unit (OCRU)¹ for Indiana bats and the USFWS Region 3² for tricolored bats. These spatial scales provide the best available and most reasonable scales to use for population estimates of covered and non-covered bat species since they are the most likely to encompass the populations that could be affected by the Project.

The effects analysis in this SEA continues to use a 6-year timeframe (2023–2028; which includes the remaining 5-year duration of the ITP), and a subsequent 22-year timeframe based on the expected remaining life of the Project (2029–2050). We estimated the cumulative bat mortality rate across relevant regions to quantify impacts from other wind energy facilities to the Indiana bat and tricolored bat populations that would be affected by the Project. While we assess cumulative impacts for non-covered bats for both the 6-year permit term and the remaining 22 years of operations, we do not analyze Project-specific cumulative effects to the Indiana bat or tricolored bat over the remaining 22 years of operations since we assume the Project would operate in accordance with the No-Action Alternative from the Final 2023 EA following the end of the permit term (i.e., effective avoidance for all four Covered Species), as explained in Section 2.1 of the Final 2023 EA. For the purpose of this analysis, we assume bat fatality rates at projected wind energy facilities would fall within the range associated with the American Wind Energy Association (AWEA) Best Management Practice guidelines (i.e., feather all turbines below manufactures' cut-in speeds; AWEA 2015) and the rate associated with feathering turbines at wind speeds below 5.0 m/s (i.e., raised cut-in speeds implemented during the fall migratory period at most USFWS Region 3 facilities with ITPs).

As discussed in Section 3.1.2 of the Final 2023 EA, wind energy development is increasing nation-wide. Based on the analysis of turbine related fatalities described in Section 3.5.2 of the Final 2023 EA, operation of the Project and other wind energy development projects have the potential to kill bats. The Service anticipates that bats will sustain similar effects at all wind projects in the analysis area. In

¹ The Ozark-Central Recovery Unit (OCRU) includes Arkansas, Illinois, Iowa, Missouri, and Oklahoma.

² USFWS Region 3 includes Minnesota, Iowa, Missouri, Wisconsin, Illinois, Indiana, Michigan, and Ohio.

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addition, wind energy development in the region could cumulatively reduce bat forest habitat, although most wind energy development would likely occur in agricultural lands in the region.

Impacts to bats due to direct fatalities at wind energy facilities are discussed separately below for the Indiana bat, tricolored bat, and non-covered bats. See the *Cumulative Effects to Bats* subsection of Section 3.5.2.2 of the Final 2023 EA for additional details on the cumulative effects analysis.

Indiana Bat

Based on the NREL Mid-case scenario, wind energy facilities in the Indiana bat OCRU had an estimated operating capacity of approximately 38,306 MW in 2023 and are projected to have 42,740 MW in 2024 (Gagnon et al. 2022, NREL 2023), 83,683 MW by 2028 (i.e., over the remaining 6-year permit term), and 103,058 MW by 2050 (i.e., the approximate operational life of the Project; see Table 3-1 of the Final 2023 EA; Gagnon et al. 2022, NREL 2023). To determine an Indiana bat fatality rate within the OCRU, we calculated the percent composition of Indiana bat fatalities in the OCRU using a Bayesian approach (Gelman et al. 2004; 0.02% of total bat fatalities). We then applied this percent to the all-bat mortality rate in the OCRU (7.133 bats/MW; WEST 2021), for a take rate of 0.002 bat/MW for Indiana bats in the analysis area (see Table 3-16 of the Final 2023 EA). Applying this fatality rate to the estimated 2023 and 2024 wind energy capacity of 38,306 MW and 42,740 MW yields 77 and 85 Indiana bats taken in the first and second years of the permit within the analysis area, respectively. By 2028, the annual take estimate within the analysis area would increase to approximately 167 Indiana bats based on an increased wind capacity of 83,683 MW. The annual mortality of 167 Indiana bats from wind projects in the analysis area in 2028 would be approximately 0.05% of the projected 2028 adult Indiana bat population in the OCRU (310,282 bats [see Table 3-7 of the Final 2023 EA]), assuming the population remains stable. This estimate assumes no mitigation benefit and that baseline Indiana bat populations remain constant, neither of which are a likely scenario. It also includes an overestimate of wind capacity based on including the full capacity of states that are only partially within the Indiana bat OCRU. However, it represents a worst-case scenario for the purposes of assessing cumulative effects of wind projects and the potential contribution of each alternative to the cumulative impact (see below).

The HCP Amendment Alternative would take an estimated 240 Indiana bats over the duration of the permit, accounting for 26.71% of the estimated cumulative take of 899 Indiana bats from wind energy in the analysis area during the same period (based on projected annual installed wind capacities in the analysis area multiplied by the estimated 0.002 bat/MW Indiana bat fatality rate for each year of the Permit plus Project-specific take; Table 3-7). The No-Action Alternative would take an estimated 115 Indiana bats over the duration of the permit, accounting for 14.86% of the estimated cumulative take of 774 Indiana bats from wind energy in the analysis area during the same period (Table 3-7). It should also be noted that the Applicant would fully offset estimated take associated with both the No-Action Alternative and the HCP Amendment Alternative through summer habitat protection and/or restoration.

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Table 3-7. Comparison of cumulative estimates of Indiana bat fatalities across alternatives during the permit term (2023–2028).

Source of Take	Alternative 1: No-Action Alternative	Alternative 2: HCP Amendment Alternative
Annual Project fatalities	19.16 bats/year	39.91 bat/year
Total Project fatalities through 2028	115 bats	240 bats
Total Analysis area fatalities through 2028 ¹	774 bats	899 bats
Project percent total contribution to Analysis Area fatalities through 2028	14.86%	26.71%

¹ Based on estimated annual installed wind capacity in the Indiana bat analysis area from 2023–2028 (38,306–83,683 megawatts; Table 3-1 of the Final 2023 Environmental Assessment [EA]), and an Indiana bat fatality rate of 0.002 bat per megawatt plus Project-specific take (see Table 3-16 of the Final 2023 EA).

Note: numbers in bold text are changed from the Final 2023 EA, and are the focus of the re-analysis in this SEA.

Tricolored Bat

Wind energy facilities in USFWS Region 3 (the analysis area for tricolored bat) had an estimated operating capacity of approximately 36,032 MW in 2023 and are projected to have 36,811 MW in 2024 (Gagnon et al. 2022, NREL 2023), 74,176 MW by 2028 (i.e., over the 6-year permit term), and 97,485 MW by 2050 (i.e., the approximate operational life of the Project; see Table 3-1 of the Final 2023 EA; Gagnon et al. 2022, NREL 2023). To determine a tricolored bat fatality rate within USFWS Region 3, we calculated the percent composition of tricolored bat fatalities in the analysis area using only post-WNS data and a Bayesian approach (0.06% of total bat fatalities). We then applied this percent to the all-bat mortality rate in the analysis area (11.12 bats/MW; WEST 2021), for a take rate of 0.006 bat/MW for tricolored bats (see Table 3-16 of the Final 2023 EA). Applying this fatality rate to the estimated 2023 and 2024 wind energy capacity of 36,032 MW in 2023 and 36,811 MW in the tricolored bat analysis area yields 216 and 221 tricolored bats taken in the first and second years of the permit within the analysis area, respectively. By 2028, the annual take estimate within the analysis area would increase to approximately 445 tricolored bats based on an increased wind capacity of 74,176 MW. The annual mortality of 445 tricolored bats from wind projects in the analysis area in 2028 would be approximately 4.5% of the projected 2028 tricolored bat population in the analysis area (9,900 bats [see Table 3-10 of the Final 2023 EA]), assuming the population remains stable. This estimate assumes no mitigation benefit and that baseline tricolored bat populations remain constant.

At the end of the permit term, the cumulative estimated take in the analysis area totaled over six years would equal 1,743 tricolored bats, with the Project contributing 16 tricolored bat fatalities (from Year 1 only) to cumulative take under the No-Action Alternative (Table 3-8). The HCP Amendment Alternative would take an estimated 150 tricolored bats over the duration of the permit, accounting for 7.92% of the estimated cumulative take of 1,893 tricolored bats from wind energy in the analysis area during the same period (Table 3-8). It should also be noted that the Applicant would fully offset tricolored bat take associated with the HCP Amendment Alternative through summer habitat protection and/or restoration. Table 3-8 provides a summary of cumulative effects to tricolored bats from each of the analyzed alternatives and from the future installed capacity of wind projects in the analysis area.

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Table 3-8. Comparison of cumulative estimates of tricolored bat fatalities across alternatives during the permit term (2023–2028).

Source of Take	Alternative 1: No-Action Alternative	Alternative 2: HCP Amendment Alternative
Annual Project fatalities	0 bats/year	25 bats/year
Total Project fatalities through 2028	16 bats (in Year 1 only)	150 bats
Total Analysis Area fatalities through 2028 ¹	1,759 bats	1,893 bats
Project percent total contribution to Analysis Area fatalities through 2028	0.91%	7.92%

¹ Based on estimated annual installed wind capacity in the tricolored bat analysis area from 2023–2028 (36,032–74,176 megawatts; Table 3-1 of the Final 2023 Environmental Assessment [EA]), and a tricolored bat fatality rate of 0.006 bat per megawatt plus Project-specific take (see Table 3-16 of the Final 2023 EA).

Note: numbers in bold text are changed from the Final 2023 EA, and are the focus of the re-analysis in this SEA.

Non-covered Bats

To provide context for the cumulative mortality of non-covered bat species over the life of the Project, given the unknowns regarding the long-term effect wind energy facilities will have on non-covered species population sizes, we calculated the cumulative mortality of non-covered bat species at operational years 8, 20, and 30 (2028, 2040, and 2050) by applying the Project and analysis area fatality rates to the projected wind energy capacity for each of these years in the analysis area (Table 3-1 of the Final 2023 EA). These dates provide fatality estimates at the end of the permit term, 12 years thereafter, and at the end of the Project life. In 2028, the Project would be expected to result in approximately 1,201 and 4,479 bat fatalities under Alternatives 1 and 2, respectively. The remaining wind facilities in the analysis area would be expected to result in 671,676 and 674,954 bat fatalities under Alternatives 1 and 2, respectively, with the Project accounting for between 0.18 and 0.66% of the cumulative mortality (Table 3-9).

Cumulative mortality is less certain for the remaining life of the Project from 2029–2050; for context, the Project would be expected to result in 802 non-covered bat fatalities in years 2040 and 2050, compared to 1,057,928 and 881,966 non-covered bat fatalities in the analysis area in 2040 and 2050, respectively (Table 3-9). The Project would, therefore, account for approximately 0.11 and 0.14% of cumulative mortality in the same years, respectively.

The two alternatives do not differ substantially in the extent to which they contribute to cumulative impacts to non-covered bats (i.e., both are less than 1% of the total cumulative mortality within the analysis area in 2028, 2040, and 2050). As stated above, Cardinal Point would fully offset Covered Species mortality associated with both alternatives through summer habitat protection and/or restoration, which would also benefit non-covered bat species.

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Table 3-9. Comparison of cumulative estimates of non-covered bat fatalities across alternatives at the end of the permit term (2028), after 20 Operational Years (2040), and at the end of the Cardinal Point Wind Project Life (2050).

Source of Mortality Estimate	Alternative 1: No-Action Alternative	Alternative 2: HCP Alternative
Operational Year 8 (2028)		
Project fatalities in 2028	1,201 bats	4,479 bats
Analysis Area fatalities in 2028 ¹	671,676 bats	674,954 bats
Project percent total contribution to Analysis Area fatalities in 2028	0.18%	0.66%
Operational Year 20 (2040)		
Project fatalities in 2040	802 bats	802 bats
Analysis Area fatalities in 2040 ²	1,057,928 bats	1,057,928 bats
Project percent total contribution to Analysis Area wind fatalities in 2040	0.11%	0.11%
End of Project Life (2050)		
Project fatalities from in 2050	802 bats	802 bats
Analysis Area fatalities in 2050 ²	881,966 bats	881,966 bats
Project percent total contribution to Analysis Area fatalities in 2050	0.14%	0.14%

¹ Based on estimated annual installed wind capacity in the non-covered bat analysis area in 2028 (36,032 MW; Table 3-1 in the Final 2023 Environmental Assessment [EA]), and a non-covered bat fatality rate of 9.039 bats per megawatt (MW) plus Project-specific mortality.

² Based on estimated annual installed wind capacity in the non-covered bat analysis area in 2040 (116,952 MW; Gagnon et al. 2022, National Energy Laboratory 2023) and 2050 (97,485 MW; Table 3-1 in the Final 2023 EA), and a non-covered bat fatality rate of 9.039 bats per MW plus Project-specific mortality.

Note: numbers in bold text are changed from the Final 2023 EA, and are the focus of the re-analysis in this SEA.

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