

**WRITTEN RE-EVALUATION OF THE 2022 FINAL ENVIRONMENTAL
ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT/RECORD OF
DECISION FOR ZIPLINE INTERNATIONAL INC. DRONE PACKAGE DELIVERY
OPERATIONS IN PEA RIDGE, ARKANSAS AND SURROUNDING AREA
AND
RECORD OF DECISION**

**ZIPLINE INTERNATIONAL INC. AMENDMENT TO OPERATIONS
SPECIFICATIONS**

Introduction and Background

Introduction

This Written Re-evaluation/Record of Decision (WR/ROD) evaluates whether supplemental environmental analysis is needed to support the Federal Aviation Administration (FAA) Office of Safety Standards, Flight Standards Service decision to amend Zipline International Inc.'s (Zipline) Operations Specifications (OpSpec) to allow for the following changes to operations in Pea Ridge, Arkansas and surrounding area:

1. An increase in operations under 14 Code of Federal Regulations (CFR) Part 135 from 20 operations per day to 100 operations per day,
2. Holiday operations, and
3. Operations from 0700 (7:00 AM) to 2200 (10:00 PM) local time. The addition of nighttime operations will be from 1730 to 2200 hours.

The FAA's issuance of an amended OpSpec is a major federal action subject to the requirements of the National Environmental Policy Act of 1969 (NEPA). As such, the FAA must assess the potential environmental impacts of issuing the amended OpSpec. FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* provides that the FAA may prepare a WR/ROD to determine whether the contents of a previously prepared environmental document remain substantially valid or whether significant changes to a previously analyzed proposed action require the preparation of a supplemental environmental assessment (EA) or environmental impact statement (EIS). The affected environment and environmental impacts of Zipline drone package delivery in Pea Ridge, Arkansas and surrounding area were analyzed in the 2022 *Final Environmental Assessment, Zipline International Inc. Drone Package Delivery Operations in Pea Ridge, Arkansas and Surrounding Area* (2022 EA). The FAA's Finding of No Significant Impact (FONSI) and Record of Decision (ROD) were issued for this action on July 14, 2022. This WR/ROD evaluates whether supplemental environmental analysis is needed to support the FAA's decision to amend Zipline's OpSpec.

In accordance with Paragraph 9-2.c of FAA Order 1050.1F, the preparation of a new or supplemental EA is not necessary when the following can be documented:

1. The proposed action conforms to plans or projects for which a prior EA and FONSI have been issued or a prior EIS has been filed and there are no substantial changes in the action that are relevant to environmental concerns;
2. Data and analyses contained in the previous EA and FONSI or EIS are still substantially valid and there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts; and
3. Pertinent conditions and requirements of the prior approval have been, or will be, met in the current action.

This WR/ROD analyzes whether the three factors above have been met and provides the FAA's determination regarding whether the contents of the 2022 EA remain valid.

Background

The 2022 EA analyzed the potential environmental impacts of Zipline conducting commercial package delivery from one hub or "nest" location in Pea Ridge, Arkansas (depicted in Figure 1). The 2022 EA assessed up to 20 delivery flights per day during daylight hours up to seven days per week, with no flights on holidays. The 2022 EA did not consider nighttime operations. The FAA published a Notice of Availability (NOA) for the draft 2022 EA on June 13, 2022. The FAA received six comment submissions during the 14-day public comment period. These comments were addressed in the final EA. On July 14, 2022, the FAA published a NOA for the final EA and FONSI/ROD.

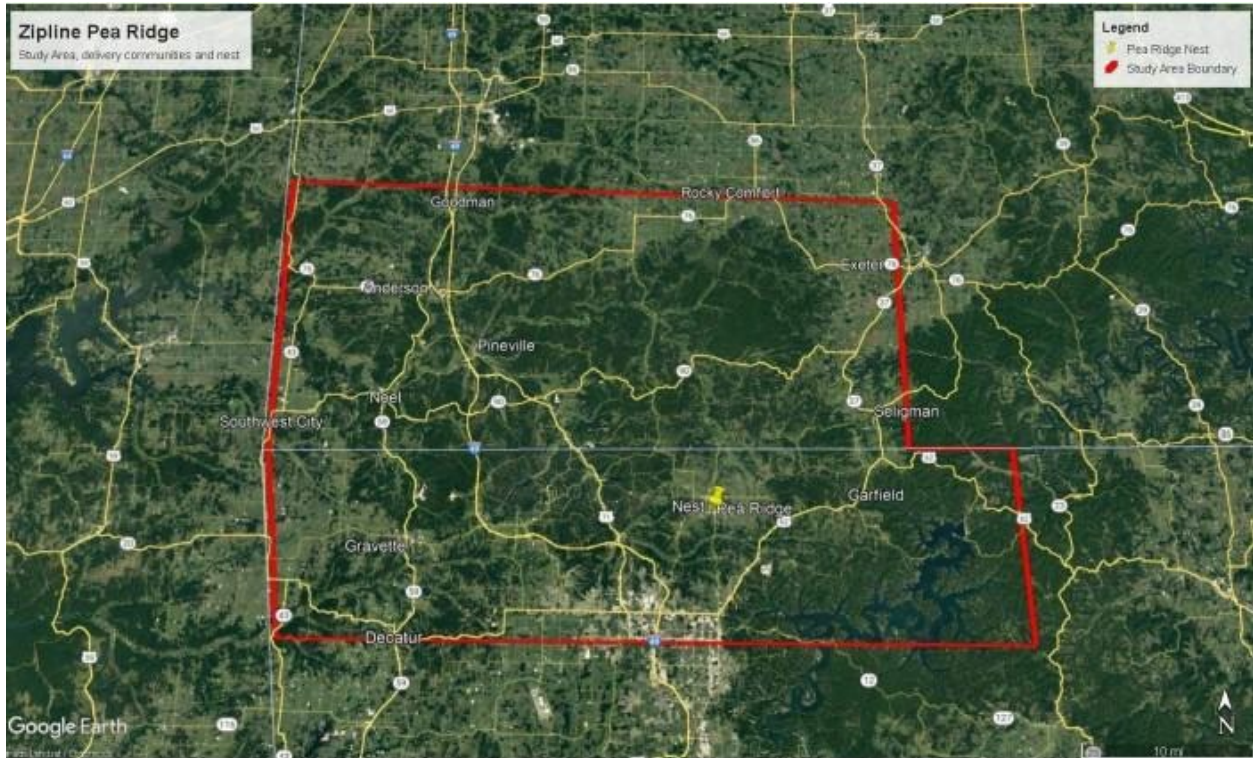


Figure 1. Zipline Operating Area in Arkansas and Missouri

The Zipline unmanned aircraft (UA or “drone”) used for delivery operations has a maximum takeoff weight less than 55 pounds, including a maximum payload of approximately 4 pounds. The fixed wing flight platform uses electric power from rechargeable lithium-ion batteries and is launched from the central nest location via a launching system. Returning drones are retrieved using a wire capture line on a recovery system. The aircraft includes a parachute safety system that can be deployed in cases of emergency.

After launch, Zipline’s UA rises to a cruising altitude between 130 feet and 400 feet above ground level (AGL) and follows a preplanned route to its delivery site. Aircraft typically fly en-route between 250 feet and 400 feet AGL and always stay above 130 feet AGL, except when descending to drop a package (or respond to an emergency scenario). The aircraft descends into its delivery loop and releases a package from approximately 60 feet AGL. Packages are carried internally in the aircraft’s fuselage and are dropped by opening a set of payload doors on the aircraft. Packages descend to the delivery site under a small parachute. Zipline’s aircraft does not touch the ground in any other place than the nest (except during emergency landings), since it remains aerial while conducting deliveries.

Proposed Action

Zipline has requested an OpSpec amendment to increase the scope of its operations to include the following:

1. An increase in operations from 20 delivery flights per day to 100 delivery flights per day,
2. Delivery flights on holidays, and
3. Delivery flights from 0700 (7:00 AM) to 2200 (10:00 PM) local time which increases the flight times from 1730 to 2200 hours.

All other aspects of the action analyzed in the 2022 EA remain the same, including the UA, flight profile, and operating area (refer to Chapter 2 of the 2022 EA). Under Part 107, Zipline has been operating seven days a week in the Pea Ridge operating area, including some holidays, with flights approximately 10 minutes in duration up to 90 flights per day. Under the proposed action, Zipline intends to transition existing operations under Part 107 to Part 135.

Affected Environment

The affected environment under the proposed action remains largely the same as discussed in the 2022 EA. No substantial changes or alterations have occurred to the environmental impact categories or the study area. Thus, the EA remains a valid discussion of the affected environment for the proposed action.

Under Part 107, Zipline has been operating seven days a week in the Pea Ridge operating area, including some holidays, with flights approximately 10 minutes in duration up to 90 flights per day. The FAA issued Zipline a Part 107 waiver ¹in March 2022, which authorized Zipline to operate at night. To date, Zipline has flown over 690 nighttime flights under Part 107 in the Pea Ridge operating area.

Zipline intends to transition all current operations in Pea Ridge, Arkansas, and surrounding area from Part 107 to Part 135 and to be implemented as described by the proposed action.

Re-evaluation of Environmental Consequences

Resources Not Analyzed in Detail

The following environmental impact categories were reviewed and dismissed from detailed analysis in the 2022 EA: air quality; climate; coastal resources; farmlands; hazardous materials, solid waste, and pollution prevention; land use; natural resources and energy supply; socioeconomics (excluded

¹ On June 28, 2016, the FAA published Part 107, which allowed people to begin conducting routine, civil small UAS operations (Operation and Certification of Small Unmanned Aircraft Systems, 81 FR 42064). On January 15, 2021, the FAA published a final rule amending Part 107 to permit routine small UAS operations at night or over people under certain conditions (Operation of Small Unmanned Aircraft Systems over People, 86 Fed. Reg. 4314). The FAA applied a Categorical Exclusion to the Part 107 Rule and the Part 107 Amendments to satisfy its compliance with NEPA and other special purpose environmental laws.

environmental justice); children's environmental health and safety risks; visual effects (light emissions only); and water resources (wetlands, floodplains, and groundwater). Refer to Section 3.1 of the 2022 EA for the rationale for dismissing these impact categories.

The changes to the action analyzed in the 2022 EA—increasing daily operations, operating on holidays, and operating during some hours of darkness—does not change the rationale for dismissing those impact categories, other than light emissions. Therefore, all impact categories originally dismissed, other than visual effects, are not re-evaluated in this WR/ROD. The impact categories that were analyzed in detail in the 2022 EA are re-evaluated below in the context of the changes to the action.

Biological Resources (including Fish, Wildlife, and Plants)

Potential impacts to biological resources under the proposed action would be comparable to those impacts described in the 2022 EA. The study area the FAA analyzed for biological resources in the 2022 EA would not change under the proposed action.

The FAA determined the action assessed in the 2022 EA would have *no effect* on species listed by the Endangered Species Act (ESA). Furthermore, Zipline established a half-mile buffer around Crystal Cave in Bella Vista, AR from March 15 to October 1 to avoid disturbance to roosting gray bats (*Myotis grisescens*).

As described in the 2022 EA, adverse impacts to migratory birds are not expected; some birds may be briefly disturbed by UA operations but would not experience adverse energy expenditure or stress outside the range of natural variation. Zipline has also agreed to a monitoring plan for bald eagle nests that integrates multiple strategies and resources, including iNaturalist observations. If Zipline identifies a bald eagle nest or is notified of the presence of a nest, Zipline will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. This avoidance area will be maintained until the end of the breeding season (September 1 through July 31 in the study area) or until a qualified biologist indicates the nest has been vacated.

As described in the 2022 EA, Zipline's operations do not involve ground construction or habitat modification, as the landing and takeoff location is in lot that is already developed. No impacts to fish, reptiles, or terrestrial mammal species are expected. All UA operations would occur within airspace, and typically well above the tree line and away from sensitive habitats. Given the altitude of the flights and low recurrence of delivery operations at any individual location within the approximately 1,200-square mile operating area, UA operations are not expected to significantly affect wildlife.

The changes to the action analyzed in the 2022 EA—increasing daily operations, operating on holidays, and operating during some hours of darkness—would not substantially change the potential impacts on biological resources. Increased nest operations would produce marginally greater levels of noise, light, and human activity at the existing nest location. However, the nest is located in a Walmart parking lot and is surrounded by low quality, edge habitat. Any common, urban species in the vicinity of the nest site are likely habituated to human disturbance and would not be

adversely affected by increased nest operations. Similarly, increased frequency of operations would likely only marginally increase UA-related disturbance to biological resources. Due to the large size of the study area, individual locations within the 1,200-square mile operating area would only experience marginally increased overflights. Biological resources within the operating area would not experience a substantially greater number of overflights; any additional disturbance caused by overflights would not increase stress, reduce reproductive success, or induce injury or mortality outside the range of natural variation for any species.

While the addition of nighttime delivery flights would involve emission of additional lighting for aircraft identification and safety, these lights are not expected to substantially impact biological resources. Zipline's UAs are equipped with two lights on each wing tip, directional red and green center lights, and a strobe. These lights are automatically powered during operations after civil twilight and are visible from three statute miles to allow other aircraft to identify operating UAs in low-light conditions. Prolonged exposure to artificial lighting can affect foraging, susceptibility to predation, activity rates, and behavior of many wildlife species (Beier 2006). However, given the relatively low frequency of overflight of any given area and the large size of the operating area, operation of safety lights would not substantially alter the light environment for biological resources or induce behavioral changes in any exposed species. Any temporary disturbance from safety light exposure would only last the duration of the overflight and would not alter energy expenditure or reproductive success outside the range of natural variation.

As described above, Zipline has been operating under Part 107 in the study area at a frequency much higher than the 20 daytime flights per day that was analyzed in the 2022 EA. Under Part 107, Zipline has been operating seven days a week, including some holidays, with up to 90 flights per day in the Pea Ridge operating area. To date, Zipline has flown over 690 nighttime flights under Part 107 in the Pea Ridge operating area. Thus, the proposed action is similar to existing conditions and is not expected to result in impacts that are dramatically different than those potential impacts described in the 2022 EA.

The FAA reviewed the U.S. Fish and Wildlife Service (USFWS's) Information for Planning and Consultation (IPaC) online system on November 7, 2023, to determine if any additional species have been listed under the ESA for the study area (Attachment 1). The IPaC report includes two additional species, both of which are proposed for federal listing: 1) tricolored bat (*Perimyotis subflavus*), proposed endangered, and 2) alligator snapping turtle (*Macrochelys temminckii*), proposed threatened. Although these species may occur within the study area, neither species would be affected by the proposed action. As stated in the 2022 EA, research suggests that drones only minimally impact bat behavior and at most may cause bats low levels of disturbance in the form of altered flight paths (August and Moore 2019). Similarly, alligator snapping turtles reside in freshwater streams and lakes and are unlikely to experience perceptible visual or acoustic disturbance as a result of UA operations above the tree line. Any small amount of stress or disturbance experienced by either species would be well within the range of natural variation. As such, the FAA has determined the changes to the action would have *no effect* on the tri-colored bat and alligator snapping turtle.

Accordingly, the data and analyses contained in the 2022 EA remain substantially valid, and the proposed action is not expected to have a significant impact on biological resources.

Department of Transportation Act Section 4(f)

Impacts on Section 4(f) properties under the proposed action would be comparable to those impacts described in the 2022 EA. As described in the 2022 EA, the FAA identified many properties that could meet the definition of a Section 4(f) property, including public parks, recreation areas, and historic sites. Potential Section 4(f) resources within the operating area include, but are not limited to, the Charlie Craig State Fish Hatchery, Indian Creek Park, Memorial Park, Tanyard Creek Nature Trail, Pea Ridge National Military Park, Buffalo Hills Natural Area, Big Sugar Creek State Park, Flag Spring Conservation Area, and Huckleberry Ridge Conservation Area. No wildlife refuges were identified within the operating area. The 2022 EA determined the proposed action would not result in a physical or constructive use (i.e., substantial impairment) to any of the potential Section 4(f) resources or properties in the operating area.

Under the proposed action, there would be no change to the study area that was reviewed in the 2022 EA, and no new Section 4(f) resources that would require further analysis. The changes to the action analyzed in the 2022 EA—increasing daily operations, operating on holidays, and operating during some hours of darkness—would not substantially change the impacts on potential Section 4(f) properties. Although the proposed action would increase the frequency of operations, it is highly unlikely that any given Section 4(f) property would experience a substantial increase in overflights given their dispersion throughout the 1,200-square mile operating area. Furthermore, Zipline already operates seven days a week, including some holidays, with up to 90 flights per day in the Pea Ridge operating area under Part 107. To date, Zipline has flown over 690 nighttime flights. Thus, the proposed action is similar to existing conditions and is not expected to result in impacts that are dramatically different than those potential impacts described in the 2022 EA. There are no substantial changes in the proposed action relevant to environmental findings in the 2022 EA, and there are no significant new circumstances or information relevant to environmental concerns under the current action. Accordingly, the data and analyses contained in the 2022 EA remain substantially valid, and the proposed action is not expected to have a significant impact on Section 4(f) properties.

Historical, Architectural, Archeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resource impacts under the proposed action would be comparable to those impacts described in the 2022 EA. The study area, as well as the Area of Potential Effects (APE) defined as part of National Historic Preservation Act Section 106 consultation with State Historic Preservation Officers (SHPOs), previously analyzed in the 2022 EA, would not change under the proposed action.

The FAA previously consulted the Arkansas and Missouri SHPOs and six Tribal Historic Preservation Officers (THPOs) for tribes that may potentially attach religious or cultural significance to resources in the APE for specific sample routes from the Pea Ridge nest instead of a broader area approval contemplated in the 2022 EA. The previous consultation included a letter to the Arkansas SHPO on

June 15, 2021, where the Arkansas SHPO responded on July 7, 2021, concurring with FAA's determination that no historic properties would be adversely affected by the proposed project. The previous consultation also included a letter to the Missouri SHPO on June 15, 2021, where the Missouri SHPO responded on June 28, 2021, concurring with the FAA's determination of *no historic properties affected*.

Additionally, in June 2021, the FAA consulted with the Apache Tribe, Caddo Nation, Delaware Nation, Delaware Tribe of Indians, Osage Nation, and Seneca-Cayuga THPOs and did not receive any responses or objections. While the SHPO and THPO outreach the FAA conducted in 2021 was for specific sample routes from the Pea Ridge nest instead of a broader area approval, the UA flight characteristics and approximate number of operations will not be significantly different under the proposed action that was the subject of the 2022 EA; however, there would be more routes as Zipline conducts operations to approved delivery locations in 12 communities across the operating area. The UA flight characteristics and approximate number of operations will not be significantly different under the proposed action compared to the action previously consulted on; instead, the operations will be dispersed over a larger area and via more routes.

Based on the nature of potential UA effects on historic properties—namely limited to non-physical, reversible impacts from visual presence and noise of transiting UAs—and the limited number of daily flights in conjunction with the FAA's noise exposure analysis, the FAA has determined this undertaking does not change the previous determination and does not require reinitiating consultation. Additionally, there would be no known effect on cultural resources from this action. Therefore, the action will not have a significant impact to historic, architectural, archaeological, or cultural resources. While not required under 36 CFR § 800.3(a)(1), the FAA notified the Arkansas and Missouri SHPOs of the availability of the draft EA on June 13, 2022. Although concurrence is not required under 36 CFR § 800.3(a)(1), on June 27, 2022, the Arkansas SHPO responded to the FAA's notice stating the SHPO "still concurs with the finding of no adverse effect to historic properties pursuant to 36 CFR § 800.5(b)(1) as a result of this undertaking." Accordingly, the data and analyses contained in the 2022 EA remain substantially valid, and the proposed action is not expected to have a significant impact on historical, architectural, archaeological, and cultural resources.

Noise and Noise-Compatible Land Use

Impacts related to noise and noise-compatible land use under the proposed action would be comparable to those impacts described in the 2022 EA.² During the preparation of the 2022 EA, the FAA initiated an analysis of potential noise exposure in the area that could result from implementation of the proposed action. The FAA's Office of Environment and Energy approved the use of this noise methodology as detailed in the 2022 EA and concurred with continued use of this methodology for this WR/ROD (see Attachment 1).

²The FAA has issued requirements for assessing aircraft noise in FAA Order 1050.1F, Appendix B. The FAA's required noise metric for aviation noise analysis is the yearly Day-Night Average Sound Level (DNL) metric. A significant noise impact is defined in Order 1050.1F as an increase in noise of DNL 1.5 decibel (dB) or more at or above DNL 65 dB DNL noise exposure or a noise exposure at or above the 65 dB level due to a DNL 1.5 dB or greater increase. The compatibility of existing and planned land uses with an aviation proposal is usually associated with noise impacts.

The Day-Night Average Sound Level (DNL) noise exposure analysis concluded that for all flight phases, and even in areas with the highest noise exposure (i.e., the nest), noise levels would still be well below FAA's DNL 65 decibel (dB) threshold at noise-sensitive receivers.

When considering the noise levels associated with Zipline's level of operations combined with existing aircraft noise levels in these areas, noise levels would not increase by DNL 1.5 dB within areas of existing aviation noise exposure of DNL 65 dB or newly expose an area to DNL 65 dB as a result of a DNL 1.5 dB increase.

Accordingly, the data and analyses contained in the 2022 EA remain substantially valid. There are no substantial changes in the proposed action that are relevant to noise impact findings in the 2022 EA, and there are no significant new circumstances or information relevant to environmental concerns under the current action. The proposed action considered in this WR/ROD would not have a significant impact on noise.

Environmental Justice

Impacts related to environmental justice under the proposed action would be comparable to impacts described in the 2022 EA. There would be no changes to the study area under the proposed action. The 2022 EA analyzed potential effects across multiple impact categories that could occur as a result of Zipline's proposed operations throughout the study area. As described in the 2022 EA, the FAA determined the percentage of minorities residing within the study area was not meaningfully greater than the percentage of minorities residing within the reference community. The proposed action will not result in adverse impacts in any environmental resource category. In particular, the UA's noise emissions will stay well below the level determined to constitute a significant impact. The changes to the action analyzed in the 2022 EA—increasing daily operations, operating on holidays, and operating during some hours of darkness—are comparable and within the scope of the impacts analyzed in the previous 2022 EA. Accordingly, the data and analyses contained in the 2022 EA remain substantially valid, and the proposed action is not expected to result in significant impacts related to environmental justice.

Visual Effects (including Light Emissions)

The 2022 EA addressed visual resources and visual character but did not address potential visual effects from light emissions, because the proposal did not include nighttime operations. This WR/ROD considers light emissions because the proposed action includes operations during darkness.

Visual effects under the proposed action would be comparable to those emissions and impacts described in the 2022 EA, including the no action alternative. Zipline's UAs are equipped with two lights on each wing tip, directional red and green center lights, and a strobe. These lights are automatically powered during operations after civil twilight and are visible for three statute miles to allow other aircraft to identify operating UAs in low-light conditions. Given the relatively low frequency of overflight of any given area and the large size of the operating area, operation of safety lights would not substantially alter the light environment. Furthermore, Zipline has already been

operating at night under Part 107 and has conducted 690 flights after civil twilight. As such, the proposed action does not represent a substantial change to current lighting conditions already present within the operating area.

The proposed action makes no changes to any landforms, or land uses, thus there would be no effect to the visual character of the area. The proposed action involves airspace operations that could result in visual impacts to sensitive areas where the visual setting is an important resource of the property. However, Zipline has confirmed to the FAA that it will generally not conduct operations over potentially sensitive properties during the scope of operations covered by this proposed action. Some of these properties are certain types of resources that could be valued for aesthetic, including visual, attributes, such as schools, sports arenas, outdoor recreation areas, and playgrounds. Further, the short duration that each UA flight could be seen from any particular resource in the operating area combined with the low number of proposed flights per day minimizes any potential for significant impacts. Accordingly, the data and analyses contained in the 2022 EA remain substantially valid, and the proposed action is not expected to have a significant impact related to visual effects (including light emissions).

Water Resources (including Surface Waters, Wild and Scenic Rivers,)

Impacts related to surface waters under the proposed action would be comparable to those impacts described in the 2022 EA. There would be no changes to the study area under the proposed action and no construction activities that could impact surface waters (including waters of the United States and wild and scenic rivers). As noted in the 2022 EA, there are no wild and scenic rivers in the study area. There are three river segments that are on the Nationwide Rivers Inventory (NRI) in the southwest Missouri section of the study area: Shoal Creek, Big Sugar Creek, and Elk River. As stated in the 2022 EA, Zipline's delivery flights will not overfly NRI river segments at an intensity that could cause any detrimental impacts to the values of these resources. Currently, UA operations can occur over these river segments under existing regulatory authorities. During preparation of the 2022 EA, the FAA contacted the National Park Service (NPS) Regional Rivers Coordinator in April 2022 for assistance in determining whether Zipline's overflights could potentially affect the recreational values of these three NRI segments. The NPS Regional Rivers Coordinator responded in May 2022 and confirmed the action will not preclude the listed NRI segments from being considered for inclusion in the National Wild and Scenic Rivers System. The FAA's outreach letter and NPS response letter are included in Appendix G of the EA.

The changes to the action analyzed in the 2022 EA—increasing daily operations, operating on holidays, and operating during some hours of darkness—would not substantially change the impacts on surface waters, including NRI river segments. There are no substantial changes in the proposed action that are relevant to environmental findings, and there are no significant new circumstances or information relevant to environmental concerns under the current action. Accordingly, the data and analyses contained in the 2022 EA remain substantially valid, and the proposed action is not expected to have a significant impact on water resources.

Cumulative Impacts

The 2022 EA was prepared in accordance with the 2020 Council on Environmental Quality (CEQ) regulations, which did not require an analysis of cumulative impacts. The May 2022 CEQ regulations reinstated several regulatory provisions that were in effect before enactment of the 2020 rule, including the requirement to analyze cumulative impacts. Therefore, an assessment of cumulative impacts is provided below to determine if the proposed action, along with the potential environmental impacts of past, present, and reasonably foreseeable actions, would result in significant cumulative impacts.

The incremental noise impacts from increasing daily operations under Zipline's proposed drone package delivery operations in the operating area are not anticipated to be significant. Drone operations, outside of Zipline's operations, conducted in accordance with 14 CFR Part 107, as well as recreational drone operations, may occur within the proposed operating area, but such operations would be infrequent and are not expected to combine with the proposed action to result in significant cumulative impacts to any environmental impact category.

As summarized above and described in the 2022 EA, most of the direct and indirect environmental impacts from Zipline's proposal to conduct package delivery operations in the operating area are minimal and result from noise emissions of operating drones. Although other drone operations are not currently planned or foreseeable within the operating areas, other common sources of noise such as ground vehicle traffic, air traffic, and construction could contribute additive noise-related effects. However, given the short duration of drone flights and the large scale of the operating area, it is highly unlikely that drone operations included in the proposed action would noticeably contribute to the cumulative noise environment of the study area. Therefore, Zipline operations, when considered in conjunction with other past, present, and reasonably foreseeable actions, would not produce cumulative noise impacts.

Given the proposed action's expected minimal environmental impacts and limited potential and duration to overlap with environmental impacts from other past, present, and reasonably foreseeable actions, the proposed action is not expected to result in significant cumulative impacts.

Findings

The FAA prepared this WR/ROD to determine whether Zipline International Inc.'s request for an amendment to its OpSpec for commercial drone package delivery operations conforms to the prior environmental documentation and the data contained in the 2022 EA remains substantially valid, there are no significant environmental changes, and all pertinent conditions and requirements of the prior approval have been met or will be met in the current action.

The areas evaluated in this WR included biological resources; Department of Transportation Act, Section 4(f); historical, architectural, archeological, and cultural resources; noise and noise-compatible land use; visual effects; and water resources.

Based on the above review and in accordance with FAA Order 1050.1F, paragraphs 9-2(c) and 9-3, the FAA has determined that preparation of a supplemental or new EA or EIS is not necessary.

Decision and Order

The FAA recognizes its responsibilities under NEPA, CEQ regulations, and its own directives. Recognizing these responsibilities, I have carefully considered the FAA's goals and objectives in reviewing the environmental aspects of the current proposed action to approve Zipline's request to amend Zipline's OpSpec to allow changes to its UA commercial package delivery operations in Pea Ridge, Arkansas and the surrounding area.

This WR/ROD considered the original 2022 EA and FONSI/ROD, which included the purpose and need to be served by the proposed action, alternatives to achieving them, the environmental impacts of these alternatives, and conditions to preserve and enhance the human environment. The attached WR/ROD provides a fair and full discussion of the impacts of the current proposed action. The NEPA process included appropriate consideration for avoidance and minimization of impacts, as required by NEPA, the CEQ regulations, and other special purpose environmental laws, and appropriate FAA environmental orders and guidance. The FAA believes that, with respect to the proposed action, the NEPA requirements have been met.

Having carefully considered and being properly advised as to the anticipated environmental impacts of the current proposed action, as re-evaluated with respect to the 2022 EA and FONSI/ROD, under the authority delegated by the Administrator of the FAA, I find the OpSpec amendment, and other approvals necessary to enable Zipline's requested operations in Pea Ridge, Arkansas and the surrounding area is consistent with existing national environmental policies and objectives as set forth in Section 101 of NEPA and other applicable environmental requirements, and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(C) of NEPA. I further find that the action is the type of action that does not require an Environmental Impact Statement under NEPA.

Responsible FAA Official: _____

Derek Hufty
Manager, General Aviation and Commercial Operations Branch
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Right of Appeal

This WR/ROD constitutes a final agency action and a final order taken pursuant to 49 U.S.C. §§ 40101 et seq., and constitutes a final order of the FAA Administrator, which is subject to exclusive

judicial review by the Courts of Appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110. Any party having substantial interest in this order may apply for a review of the decision by filing a petition for review in the appropriate U.S. Court of Appeals no later than 60 days after the order is issued in accordance with the provisions of 49 U.S.C. § 46110.

References

Beir, P. 2006. Effects of Artificial Night Lighting on Terrestrial Mammals. Ecological consequences of night lighting on terrestrial mammals, 19-42.

August, T. and T. Moore. 2019. Autonomous drones are a viable tool for acoustic bat surveys. BioRxiv. Available: <https://www.biorxiv.org/content/10.1101/673772v1.full.pdf>.



Federal Aviation Administration

Memorandum

Date: November 16, 2023

To: David Senzig, Manager (Acting), Noise Division, Office of Environment and Energy (AEE-100)

From: Adam Scholten, Noise Division, Office of Environment and Energy (AEE-100)

Subject: Review of Written Re-evaluation (WR) Noise Analysis Methodology for Zipline International Inc. Proposed Amended Sparrow/P-1 UA Operations in Pea Ridge, AR and Surrounding Area

The Office of Environment and Energy, Noise Division (AEE-100), is assisting the Office of Flight Standards, General Aviation and Commercial Branch (AFS-752) with the noise analysis for the Written Re-evaluation (WR) of the 2022 Final Environmental Assessment (EA), Finding of No Significant Impact, and Record of Decision (FONSI/ROD) for Zipline International Inc. (Zipline) proposed amended operations using the Sparrow/P-1 unmanned aircraft (UA) in Pea Ridge, Arkansas (AR) and the surrounding area to provide package delivery services as a 14 CFR Part 135 operator.

The Proposed Action is for Zipline to expand existing operations using the Sparrow/P-1 UA in Pea Ridge and the surrounding area to deliver packages from a single central distribution center, referred to as a “nest”, connecting to a supporting route network to deliver packages to potential delivery locations (“delivery sites”) such as medical centers, health facilities, and private homes within the operating area to twelve surrounding communities. Typical operations of the UA consist of departure from the nest via launch by catapult and a climb to an approximate en route altitude between 250-400 feet above ground level (AGL). The UA then navigates along a defined path from the nest to the intended delivery site. Approaching the delivery site, the UA will fly a pattern near the delivery point, descend to 60 feet AGL, and drop a package via parachute within a pre-defined drop zone. Following delivery, the UA will climb back to en route altitude, fly along a defined path back to the nest, and then be recovered at the nest via a cable driven arrestor system.

Under the scope of the Proposed Action Zipline has submitted an adjustment to their existing approved Operations Specifications (OpSpecs) and referenced in OpSpec B050, Authorized Areas of En Route Operations, Limitations, and Provisions. This adjustment reflects expanding hours of operations to reflect operating from 7 AM to 10 PM local time, allowing for operations to occur on holidays, and increasing the number of daily delivery operations from a single nest from a maximum of 20 per day to 100 per day distributed among twelve communities within the previously approved operating area. Under the Proposed Action Zipline does not propose conducting deliveries during acoustical nighttime hours, which are defined as the period between 10 PM and 7 AM local time. Approval of a Federal Action amending Zipline’s OpSpecs is required before these expanded operations can occur.

As the FAA does not currently have a standard approved noise model for assessing UA, and in accordance with FAA Order 1050.1F, all non-standard noise analysis in support of the noise impact analysis for the National Environmental Policy Act (NEPA) must be approved by AEE. A prior noise analysis methodology was approved by AEE for evaluating Zipline's initial package delivery operations in Pea Ridge, AR with the Sparrow/P-1 UA as detailed in Appendix C of the July 2022 EA¹. However, since the completion of that EA, preliminary supplemental noise measurements for the Sparrow/P-1 UA were provided to AEE in May 2022 in conjunction with noise certification tests². Notably, the supplemental noise measurements indicate differences in the measured noise levels for some flight phases of the Sparrow/P-1 UA relative to the measurements used in the previously approved noise analysis methodology.

Upon further analysis of the supplemental noise measurements and comparison to the previously approved noise analysis methodology, as well as consideration of the scope of the Proposed Action, AEE believes continued use of the previously approved noise analysis methodology from the July 2022 EA is warranted for this WR. As detailed in the previously approved methodology, if Zipline were to increase operations of the Sparrow/P-1 UA up to as many as 500 daily deliveries from a single nest the resulting noise levels would be at or below DNL 45 dB for the en route and delivery flight phases. For the nest, noise levels of DNL 65 dB or greater would only occur within 25 feet of the nest infrastructure, and DNL 60 dB within 50 feet of the nest infrastructure, respectively. Considering the Pea Ridge nest and surrounding operating area, the extents of these noise levels would remain entirely on the Walmart Neighborhood Market property, would not infringe on the locations of noise sensitive receivers, and would not be expected to add DNL 1.5 dB within DNL 65 dB of airport noise contours or become DNL 65 dB with an increase of DNL 1.5 dB for those airports located within the Pea Ridge operating area. Therefore, even at an operations level of 500 daily deliveries from a single nest, they would not generate a significant impact.

Under the scope of the Proposed Action, Zipline is proposing to increase operations from a maximum of 20 to 100 delivery operations per day at the Pea Ridge nest and surrounding operating area during daytime hours (7 AM to 10 PM local time). Although there are differences in the preliminary supplemental noise measurements relative to those utilized in the previously approved noise analysis methodology, these differences would not be of the magnitude equivalent to a 25-fold increase in operations as represented by increasing daily deliveries from 20 to 500 within the operating area. This level of operations is also far beyond the scope of 100 daily deliveries as detailed in the Proposed Action. Therefore, AEE does not believe use of an updated noise analysis methodology incorporating the preliminary supplemental noise measurement data would change the conclusions reached for the noise analysis relative to the July 2022 EA and concurs with continued use of the previously approved noise analysis for this WR.

Please understand that this concurrence is limited to this particular WR, location, vehicle, and circumstances associated with the Proposed Action for Zipline to increase operations from a maximum of 20 to 100 delivery operations per day at the Pea Ridge nest and surrounding operating area during daytime hours. Any additional projects using this or other methodologies or variations in the vehicle will require separate approval.

¹ Final Environmental Assessment and Finding of No Significant Impact/Record of Decision Zipline International Inc. Drone Package Delivery Operations in Pea Ridge, Arkansas and Surrounding Area, FAA, July 2022, https://www.faa.gov/sites/faa.gov/files/2022-07/FONSI-ROD_and_Final_EA_Zipline_Pea-Ridge-and-Surrounding-Area_7-14-22_signed_508.pdf

² J R Engineering Document JR394 IR, Noise Compliance Report: Zipline Sparrow, J R Engineering, May 11, 2022