Bat Conservation Strategy for the State of Arkansas

(2025, v1.0)

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INTRODUCTION

In accordance with the Endangered Species Act of 1973 (ESA)(16 U.S.C. 1531 et seq.), the U.S. Fish and Wildlife Service (Service) Arkansas Field Office (AFO) has developed this Conservation Strategy (Strategy) as a suggested framework for Federal agencies and project proponents (collectively referred to as "proponents") to account for the loss of forested habitat important for certain federally listed, forest-dwelling bat species in the State of Arkansas. In situations where its authorities apply, the AFO will implement the Strategy as a means of enhancing the conservation and recovery of the Indiana bat (*Myotis sodalis)* and northern long-eared bat (*Myotis septentrionalis*) in Arkansas, hereinafter referred to as the covered species. The Strategy provides proponents with the flexibility to address adverse effects from their projects and facilitates meaningful conservation and recovery actions for the covered species in Arkansas. The Strategy also establishes, via a section 7 nexus and the associated programmatic biological opinion, recovery-focused conservation options that a proponent can voluntarily select and use to help recover the species, enable sustainable development, and efficiently comply with section 7(a)(2) of the ESA.

An explanation of terms relevant to this document is provided in Appendix A. The Service's authorities for developing and implementing this Strategy are found in Appendix B.

COVERAGE AREA

The coverage area for the Strategy is the entire State of Arkansas and a 20-mile buffer into the surrounding states of Louisiana, Texas, Oklahoma, Missouri, Tennessee and Mississippi. Including this buffer in the coverage area helps account for potential swarming impacts associated with caves or known maternity colonies close to or overlapping state lines. It also helps address effects from interstate projects that propose impacts to forested habitat important for the covered species. Use of the Strategy for adverse effects within the 20-mile buffer must be acceptable to the proponent and the Service field office(s) in the adjacent state(s).

COVERED SPECIES AND LIFE HISTORY TIMEFRAMES[1]

Indiana Bat (*Myotis sodalis*)
Northern Long-eared Bat (*Myotis septentrionalis*)

Hibernation	Spring Staging and Migration	Summer Occupancy	Pup Season	Fall Migration and Swarming
November 16 – March 14	March 15 – April 30	March 15 – September 30	May 15 – July 31	August 16 – November 15

[1] Life history timeframes will follow those found in the most recent version of the Range-Wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines

STATUS OF COVERED SPECIES

In Arkansas, the covered species are dependent upon caves and cave-like features for winter hibernation and primarily use trees for summer roosts. Although the species share these general life history characteristics, the known distributions of each species and specific habitats they occupy vary.

See Appendix C for a summary of the status of the Indiana bat within the coverage area.
See Appendix D for a summary of the status of the northern long-eared bat within the coverage area.

CONSERVATION PRIORITIES

The Indiana bat is the only covered species for which the Service has prepared a recovery plan (in draft form), though recovery planning is underway for the northern long-eared bat. We adopt the recovery actions for the Indiana bat (i.e., conservation of hibernacula, conservation of summer habitat, conduct essential research, and implementation of public information/outreach programs) as the conservation goals of this Strategy. Based on these goals, we have established Priority Conservation Areas for Arkansas. While based on the goals of the draft Indiana bat recovery plan, we expect that northern long-eared bats, as well as other bat species, will benefit from implementation of the conservation priorities described below.

Arkansas Conservation Priorities

Based on its review of the best scientific and commercial data that is currently available, the AFO has identified the following conservation priorities for the covered species:

- Conserve hibernacula via perpetual protection of the hibernacula and foraging range and/or prevention of human disturbance within the hibernacula;
- Conserve swarming habitat via perpetual protection of the swarming site and foraging range and/or prevention of human disturbance of the swarming site;
- Conserve occupied summer habitat via perpetual protection.
- Conserve summer habitat that is of high quality and/or is associated with or connects other bat conservation areas via perpetual protection.

Service Areas

Impacts to covered species will be tracked by service area (see Appendix E) using a standardized process. This will allow the AFO to:

(a) Track incidental take of each listed bat species within the portion of the state where effects occur, using habitat as the surrogate for quantifying and tracking such take.
(b) Identify and implement conservation efforts in each service area with partners, directly addressing impacts to covered species by restoring and/or maintaining suitable bat habitat and supporting the conservation priorities identified previously in this section.
(c) Promote higher levels of consistency among conservation banks, in-lieu fee programs, and proponent-responsible mitigation providers.

Service areas were identified by the AFO using over four decades of data specific to the covered species related to hibernation, spring staging, migration, and summer and fall swarming habitat use within and adjacent to Arkansas. Based on over two decades of working with proponents on covered species consultations, the AFO expects impacts to continue to occur and, therefore, opportunities for conservation will also be available throughout the coverage area.

Priority Conservation Areas

Arkansas' Priority Conservation Areas (PCAs) (see Appendix E) were identified specifically to support the conservation priorities identified in the previous section and represent areas that:

- Contain protected public or private lands that are known to support populations of the covered species;
- Currently support populations of the covered species that are expected to support long-term recovery and conservation efforts;
- Contain adequate suitable habitat for the covered species that will support recovery and conservation efforts;
- Provide opportunities for future conservation efforts for the covered species, especially restoration, enhancement, and/or creation of additional summer and/or winter bat habitat; and/or
- Contain conditions, as determined by the AFO, that generally are expected to contribute to the persistence of covered species populations and habitat into the future.

Collectively, PCAs are key landscapes for conservation and recovery of the covered species in Arkansas and will be where most conservation efforts will be undertaken. Conservation efforts will be directed to the PCAs within the same service area where impacts occur or to those that best mitigate the specific impact(s).

The AFO expects, however, that efforts may also be undertaken or attempted at locations outside of the PCAs in circumstances where the conservation and/or recovery benefits to a covered species can be clearly identified and justified. The merits of conservation efforts outside of PCAs will be determined on a case-by-case basis in coordination with the AFO and will depend on a variety of factors including, but not necessarily limited to: (a) location of the site; (b) the type and quality of the conservation opportunities available; and (c) new information that justifies the conservation effort.

The AFO encourages mitigation providers and those considering project-specific mitigation efforts to prioritize the PCAs in their site selection such that the collective efforts are amplified for the greatest conservation benefit to the covered species. We encourage early coordination with the AFO to ensure appropriate siting and timely approvals.

ESA COMPLIANCE

In this section, we discuss several options available to proponents seeking ESA compliance. The Strategy is designed to provide flexibility for proponents in meeting their project needs and

regulatory requirements under the ESA, while also providing conservation benefits for the covered species. The ESA compliance options discussed in this section are applicable when a project will remove suitable forested habitat for one or more of the covered species in a manner that is reasonably certain to cause adverse effects to a covered species.

With technical assistance from a AFO biologist, proponents will select a compliance option to use based on one or more of the following factors:

1. The proponent performed an initial review using the Service's Information for Planning and Consultation (IPaC) website, and one or more of the covered species were identified in the IPaC species list, but use of the determination keys resulted in a "may affect" determination for one or more covered species. After further coordination with the AFO, it is determined that the project is "likely to adversely affect" a covered species.
2. The proponent chooses to self-evaluate potential effects to listed species rather than utilize the determination keys and makes a determination of "may affect, likely to adversely affect" for one or more covered species.
3. The proponent cannot or chooses not to conduct a presence/absence survey based on timing, cost, or other factors. Instead, at their discretion, the proponent presumes presence of a covered species within their action area and makes a determination of "may affect, likely to adversely affect" for the covered species.
4. The proponent chooses not to develop a biological assessment and seek formal consultation with the lead Federal agency and the AFO due to timing, budget, or other factors affecting their project. Instead, at their discretion, the proponent presumes presence of a covered species within their action area and makes a determination of "may affect, likely to adversely affect" for the covered species.

Election of a compliance option is at the proponent's discretion based on the specific needs or circumstances of their project. Proponents should coordinate with the AFO when determining which option best fits their needs prior to taking any irreversible action or making a final decision. A brief description for each available option is provided below.

Traditional ESA Options

Project-Specific Formal Consultation

Formal consultation only applies when Federal agencies are involved and may be best suited for larger Federal actions, though this option is applicable to any project that anticipates adverse effects to a listed species or critical habitat. During formal consultation, the Federal agency and Service share information about the proposed project and the species or critical habitat likely to be affected. The Federal agency makes an effects determination, and the Service prepares a biological opinion that evaluates the consequences of the action as related to any listed species or critical habitat.

For more information on the formal consultation process see: eCFR :: 50 CFR 402.14 -- Formal consultation.

Habitat Conservation Plan

A Habitat Conservation Plan (HCP) is best suited for non-Federal activities conducted by state or local agencies, non-Federal landowners, and private companies. They can address non-Federal activities that cross state lines or involve multi-year projects in areas where listed species occur and may be impacted. The HCP is a planning document designed to accommodate economic development to the extent possible by authorizing the take of listed species when it occurs incidental to otherwise lawful activities.

For more information on Habitat Conservation Plans see: Habitat Conservation Plans | U.S. Fish & Wildlife Service

Recovery-Focused Conservation Options

The following Recovery-focused Conservation Options (RFCOs) provide tangible conservation benefits that support recovery of the covered species, while providing flexibility, efficiencies, cost savings, and/or project predictability benefits to the proponent. Implementation of the RFCOs is supported by the AFO's programmatic biological opinion, Biological Opinion: Bat Conservation Strategy for the State of Arkansas 2025. We encourage all proponents to coordinate with the AFO early in the process to ensure the desired option is applicable and will sufficiently meet their project needs related to ESA compliance.

In-Lieu Fee Programs (Arkansas Bat Conservation Fund)

In-lieu fee programs collect funds from proponents as a result of impacts to a covered species and, when funding levels are sufficient, purchases or acquires suitable habitat that provides ecological functions and services that further conservation of the species. In-lieu fee programs may be more appropriate for smaller projects, one-time actions, or for projects with time constraints. In-lieu fee programs provide compliance for both Federal and non-Federal proponents and promote the conservation and recovery of the species.

The Arkansas Bat Fund (ABF), an in-lieu fee program, was established in 2025 and is sponsored by the Arkansas Fund for Habitat Conservation (AFHC), which operates under a Memorandum of Understanding with the AFO. The AFHC was created to oversee the Arkansas Bat and Arkansas Karst Funds and will continue to operate both funds and cooperate with the AFO in administration of the program.

Species Conservation Bank

Conservation banks are permanently protected lands that are managed for the conservation of a species and their habitat. They serve as a market-based system to offset the impact of development on endangered, threatened, or at-risk species. These banks allow the owner to sell credits to developers who need to mitigate their impacts on listed species. Service approval is required for establishment of a conservation bank and prior to purchase of credits to compensate for impacts from a project. Conservation banks may be more appropriate for smaller projects, one-time actions, or for projects with time-constraints. Currently, no conservation banks exist in Arkansas for the covered species; however, this compliance option may become available in the future.

Proponent-Responsible Mitigation

These are actions the proponent takes that provide ecological functions and services as part of the conservation measures associated with the proponent's proposed action. Typically, this involves the permanent protection of "like" habitat in the form of land owned by the proponent or purchased for this purpose. This option is best suited for landowners able to permanently set aside a portion of land that meets the requirements or have an ability to purchase land for this specific purpose. Similar to in-lieu fee programs and conservation banks, long-term management and maintenance of the conservation site is a necessary component of the mitigation plan. Proponents should consult with the AFO early in project development to determine if proposed land would be eligible and applicable to meet the requirements of this option.

Potential Exceptions for Recovery-Focused Conservation Options

The AFO has chosen to avoid and minimize potential impacts to the covered species by: (a) excluding projects that could impact known or potential hibernacula due to their importance for conservation of the covered species and the difficulty in analyzing effects related to potential hibernaculum impacts; and (b) requiring project-specific reviews of the categories of projects listed below that have an increased likelihood of impacting a covered species during crucial life history periods or resulting in direct impacts to larger numbers of individuals:

- Individual projects resulting in the loss of more than 250 acres of suitable forested habitat for any of the covered species.
- Projects occurring within 1 mile of Priority 1 (P1) or Priority 2 (P2) Indiana bat hibernacula.
- Projects occurring within ½-mile of a Priority 3 (P3) or Priority 4 (P4) Indiana bat hibernacula or an active northern long-eared bat hibernaculum.
- Individual projects resulting in the clearing of greater than 100 acres of suitable forested habitat during the pup season.
- Projects occurring within 2 miles of a confirmed Indiana bat or northern long-eared bat maternity colony.
- Projects that may result in adverse effects to the covered species from post-construction and/or operational activities other than the loss of forested habitat (e.g., permanent lighting, noise and vibrations above pre-construction levels, prescribed fire)

When a project falls within one of these categories, the AFO will perform a project-specific review and determine if a RFCO is appropriate or recommend another ESA compliance option (e.g., a project-specific consultation, HCP). The AFO will make its determination based on the information provided by the proponent, the likelihood and severity of effects, any other relevant and available data, and whether any other conservation measures are available and necessary.

APPLICATION OF THE STRATEGY

RFCOs are generally appropriate for land management, agricultural, and development activities when adverse effects to a covered species occur as the result of habitat loss and/or degradation. The AFO acknowledges that certain silviculture and sustainable agricultural practices can benefit the covered species by enhancing or preserving important habitats. We encourage proponents to

coordinate with the AFO before making final decisions on the best course of action. The AFO determined that land management, agricultural and development projects have the most utility for this type of approach because these types of project impacts are easily quantifiable, effective mitigation options are present throughout Arkansas, and there is a sufficient number and quantity of impacts to justify the expenditure of resources associated with establishing and implementing the Strategy.

Typically, a proponent will make the decision to use an RFCO after determining that the project will likely have adverse effects on a covered species and evaluating the other available ESA compliance options (e.g., species surveys, formal consultation, HCP) relative to project costs, budgets, and timeframes. As a result, the proponent's decision to use an RFCO often occurs after technical assistance or informal consultation has already begun. However, based on the Service's experience with similar Strategies in other states, a proponent may choose this option at the onset of project development due to expected impacts to habitat present within the action area and the timeliness, cost savings, and/or project predictability benefits that it can provide.

After the AFO and proponent have determined that an RFCO is appropriate and desirable, the proponent will coordinate with the AFO and/or Federal agency (when applicable) to determine the next steps. The following sections outline how the coordination process will occur and how the AFO will evaluate and determine any required actions relevant to the specific option selected by the proponent. Proponents will work with a AFO biologist throughout this process and will maintain flexibility to shift to other options as necessary to meet project goals.

The Strategy relies heavily on conservation multipliers in determining the appropriate level of compensation when utilizing one of the RFCOs. Multipliers were developed under the original in-lieu fee program (i.e., Indiana Bat Conservation Fund) based on the habitat type and time of year impacts will occur. The covered species rely heavily on forested habitat for reproduction, foraging, and commuting. The AFO determined through the programmatic biological opinion associated with this Strategy that removal of suitable forested habitat used by the covered species, regardless of time of year, is likely to result in adverse effects to the covered species, especially the Indiana bat.

Multipliers are based on the magnitude of impacts on a covered species in relation to the various stages of their life cycle. The lowest multipliers are associated with times when the fewest individuals are expected to be adversely affected, while the highest multipliers are used when impacts are likely to adversely affect the greatest numbers of individuals, including during their reproduction. During the active season, reproductively active female Indiana and northern long-eared bats exhibit philopatry by returning to established roost sites, where they form maternity colonies to give birth and raise their young. This behavior contrasts with the non-maternity period, when bats may be broadly distributed or hibernating during the non-active season. Therefore, removing trees during the maternity period will likely have a greater impact on Indiana and northern long-eared bats because more individuals are reasonably certain to be killed or injured compared to the non-maternity period, when fewer individuals would be affected at the time the trees are removed. However, the removal of trees during the non-maternity timeframe will still likely have adverse effects on individual bats due to their philopatry to roosting areas. The loss of potential roost trees and reduced habitat availability may force

individuals to travel greater distances to find suitable alternatives, increasing energy expenditure and potentially affecting reproductive success.

Proponents may choose to mitigate for one or more than one covered species, as appropriate. When a proponent chooses to mitigate for more than one covered species and the project is in known habitat for one species and potential habitat for the other species, the multiplier for known habitat will be used. If the habitat type for both species is the same (e.g., Summer 1 for the northern long-eared bat and Summer 2 for the Indiana bat), the higher of the two multipliers will be used. If the project occurs in known summer habitat for one species and known swarming habitat for the other species (e.g., Summer 1 for the Indiana bat and Swarming 1 for the northern long-eared bat), the appropriate multiplier for the combined habitats should be used.

The AFO suggests the following steps be taken to implement this Strategy.

Proponent Provides Initial Project Information to the Service

1. The amount of suitable forested habitat that will be impacted (i.e., "acres impacted") will be quantified for each covered species. For impacts involving forest blocks and other dense assemblages of suitable habitat, the acres impacted is determined by calculating the area of a polygon(s) that best surrounds the impacted habitat using Global Positioning System or Geographic Information System technology (i.e., the "habitat block method"). For impacts where suitable forested habitat is sparse, such as an individual tree separated from other suitable habitat or a narrow linear corridor (e.g., fence row, riparian corridor), each tree is counted individually, and the number of individual trees is then multiplied by 0.09 acre/tree to determine the acres impacted (i.e., the "single-tree method").
2. The timeframe(s) of all proposed habitat impacts (i.e., "impact timeframe") will be determined.
3. The habitat type(s) (i.e., potential, swarming, staging, or summer habitat) associated with proposed habitat impacts will be determined using the habitat maps in Appendices C or D.

Service Verifies and Calculates Estimated Conservation Acres

1. The AFO will verify that the project is consistent with the actions evaluated in the programmatic biological opinion and that none of the exclusions discussed above (e.g., habitat loss greater than 250 acres) would apply and prevent use of the Strategy for the project.
2. The AFO will verify the accuracy of the initial project information provided by the proponent, including the acreage and habitat type impacted.
3. The conservation multiplier (see Appendix F) will be identified based on the habitat type impacted and the impact timeframe. A worksheet to aid proponents in estimating their potential conservation multiplier, as well as a few example calculations, is provided in Appendix G. The following formula will be used to calculate the estimated initial conservation acres necessary to conserve the species after consideration of impacts.

   Conservation Acres = (acres impacted) x (conservation multiplier)
4. The conservation acres can then be used to determine the estimated compensatory

mitigation based on the per acre cost of the RFCO selected by the proponent.

Proponent Can Modify Project and Explore Compliance Options

1. Based on the estimated initial calculated conservation acres, the proponent will have the opportunity to modify the project to reduce the acres impacted, change the impact timeframe, or provide other data that could reduce the conservation amount, recognizing that such project modifications are not always possible.
2. The proponent will be given time to explore the RFCOs and decide on which option is most appropriate for their project needs and specific situation.

Proponent Makes Final Project Decision

The proponent will make the final decision on how to proceed with the project from the following options:

a. Proponent notifies the AFO of their intention to use the in-lieu fee program (i.e., ABF) and requests final approval from the AFO;
b. Proponent notifies the AFO of their intention to use an AFO-approved conservation bank and requests final approval from the AFO;
c. Proponent notifies the AFO of their intention to use proponent responsible mitigation and requests final approval from the AFO;
d. Proponent notifies the AFO of their intention to use one of the traditional ESA compliance options, such as formal consultation or HCP; or
e. Proponent notifies the AFO of their intention to withdraw the project from being considered by the AFO.

Regardless of the method a proponent selects, Section 7(d) of the ESA mandates that Federal agencies are not to irreversibly or irretrievably commit resources such that it forecloses the implementation of any reasonable and prudent alternative measures necessary to avoid jeopardizing the covered species [16 U.S.C. 1536(d)]. Therefore, a Federal agency should ensure that the AFO agrees that the method of ESA compliance that is selected by the proponent is acceptable before the Federal agency authorizes, funds, or carries out its action. For non-Federal entities, no actions should be taken that would cause take that would be prohibited by the ESA (16 U.S. C. 1538) until final approval by the AFO is obtained. The AFO will provide a letter detailing the consultation process, any conservation measures to be taken, and completion of the ESA compliance process. Conservation measures should be implemented as agreed upon and documented in an agreement or a consultation letter by the AFO, before any action is taken that would adversely affect the covered species.

MODIFICATION OF THIS STRATEGY

This Conservation Strategy is likely to be modified periodically based on new information. Modifications that could occur include but are not limited to: (a) changes to the covered species when a new species is listed or when existing species are recovered or become extinct; (b) alterations of PCAs based on trends in listed bat occurrence data; or (c) updates to the supporting information and appendices associated with this Conservation Strategy.

Appendix A: Explanation of Terms

Throughout this document, certain terminology is used to describe bat habitat and aspects of the Strategy. For the purposes of this document, the following definitions are provided for this terminology:

- "*Conservation multiplier*" is a ratio used for determining the appropriate level of compensatory mitigation. Multipliers were established based on the expected magnitude of impact on covered bats that would result from the proposed tree removal, accounting for the habitat type impacted and the time of year the impact would occur.

- "*Hibernacula*" refers to caves, cave-like structures, or anthropogenic features (e.g., mines, tunnels, etc.) where the covered species have been documented to spend some or all of the winter hibernation period.

- "*Hibernating Range*" refers to the portion of the ranges of covered species where they are using hibernacula and have been documented to spend some or all of the winter hibernation period. All Indiana bats fall within the hibernating range, whereas portions of the northern long-eared bat range fall within the hibernation range and the year-round active range. Arkansas is not located with the year-round active range of the northern long-eared bat.

- "*Impact Timeframe*" refers to the expected range of dates for which a proponent expects to complete the habitat removal associated with the project and for which any impacts to a covered species will occur. Implementation of the Conservation Strategy relies on knowing the impact timeframe to assist in determining the level of impact a potential project will have on a species and calculating the appropriate conservation.

- "*Known habitat*" refers to suitable summer, swarming, and hibernation habitat located within a predetermined distance of an occurrence record for a covered bat species. Distances will vary based on species (e.g., documented life history characteristics), the type of occurrence record (e.g., visual observation, capture, acoustic record, etc.), the habitat use associated with the occurrence record (e.g., maternity, swarming, winter, etc.), and the location (e.g., hibernating, year-round active zone 1, or year-round active zone 2).

- "*Maternity habitat*" refers to suitable summer habitat used by juveniles and reproductive (pregnant, lactating, or post-lactating) females.

- "*Service Area*" refers to a particular geographic area within the state where all impacts and conservation efforts will be tracked for the covered species. Each service area contains one or more Priority Conservation Areas for the covered species.

- "*Non-maternity habitat*" refers to suitable summer habitat used by non-reproductive adult females and/or males.

- "*Occupied*" refers to the timeframe in which suitable habitat is expected to be used by covered species. This terminology is important when evaluating the RFCOs and determining

the appropriate conservation multiplier. See Appendix F for more information on when habitats are considered occupied or unoccupied and how that designation affects project proponents' consultation options.

- "*Potential habitat*" occurs where Indiana bats and northern long-eared bats are reasonably certain to occur (i.e., identified on the IPAC species list) and suitable roosting, foraging, and travel/migration habitat for one or more of the species exists, but where use of such habitat by a species has not been documented. Potential habitat for one covered species may overlap with known habitat for another covered species.

- "*Potential hibernacula*" refers to suitable caves, cave-like structures, or anthropogenic features where covered species may spend some or all of the winter hibernation period. Features may be identified as potential hibernacula based on habitat assessments completed using Appendix H of the most recent version of the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines.

- "*Priority 1 hibernacula* (or P1 hibernacula)" refers to Indiana bat hibernacula with recorded populations of ≥10,000 individuals.

- "*Priority 2 hibernacula* (or P2 hibernacula)" refers to Indiana bat hibernacula with recorded populations of 1,000 to 9,999 individuals.

- "*Priority 3 hibernacula* (or P3 hibernacula)" refers to Indiana bat hibernacula with recorded populations of 50 to 999 individuals.

- "*Priority 4 hibernacula* (or P4 hibernacula)" refers to Indiana bat hibernacula with recorded populations of 1 to 49 individuals.

- "*Priority conservation areas*" refers to those geographical areas identified in the Conservation Strategy that are key landscapes for conservation and recovery of one or more of the covered species and will be where most conservation efforts for the covered species will be undertaken.

- "*Suitable habitat*" refers to any known or potential summer habitat, swarming habitat, staging habitat, hibernacula, and/or winter roosts where the necessary habitat components exist that are appropriate for use by the covered species.

- "*Suitable Indiana bat hibernacula*" includes all known and potential hibernacula and is restricted to underground caves and cave-like structures (e.g., abandoned mines, railroad tunnels). These hibernacula typically have a wide range of vertical structures; cool, stable temperatures, preferably between 4°C and 8°C; and humidity levels above 74 percent but below saturation.

- "*Suitable northern long-eared bat hibernacula*" refers to all known and potential hibernacula and includes underground caves and cave-like structures (e.g., abandoned mines, railroad tunnels). These hibernacula have large passages with significant cracks and crevices for

roosting; relatively constant, cool temperatures between 0°C and 9°C; high humidity levels; and minimal air currents.

- "*Suitable summer habitat*" for the covered species can be found in Appendix A of the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines.

- "*Suitable Indiana bat primary maternity roost tree* (PMRT)" refers to a dead tree or snag that is nine inches or greater in diameter at breast height (DBH) and has loose or exfoliating bark, cracks, crevices, and/or hollows. A live tree may also be a PMRT if it contains hollows or dead portions with loose or exfoliating bark, cracks, and/or crevices sufficient to support a maternity colony. Trees more than 16 inches DBH are considered optimal for maternity colony roosts, but trees in excess of nine inches DBH are known to provide suitable maternity roosting habitat.

- "*Suitable roost tree*" refers to a tree (live or dead) that exhibits characteristics suitable for roosting by the covered species. Indiana bats and northern long-eared bats typically roost under exfoliating bark, in cavities of dead, dying, and live trees, and in snags (i.e., dead trees or dead portions of live trees). For Indiana bats, suitable roost trees have a DBH of five inches or greater. For northern long-eared bats, the minimum DBH is three inches and includes trees with crevices in addition to the above-mentioned characteristics attributable to Indiana bat roosts.

  "*Summer 1 habitat*" refers to known summer habitat used by the covered species. For the Indiana bat, Summer 1 habitat is associated with maternity records and occurs within five miles of a reproductive capture record or confirmed acoustic detection location or within 2.5 miles of a documented roost tree. For the northern long-eared bat, Summer 1 habitat is used for maternity and non-maternity records because there is no known separation of habitat use by reproductive and non-reproductive individuals during the summer season. Summer 1 habitat for the northern long-eared bat occurs within three miles of a capture or confirmed acoustic detection location or within 1.5 miles of a documented roost tree.

- "*Summer 2 habitat*"- Summer 2 habitat is associated with Indiana bat non-maternity records and occurs within 2.5 miles of a capture location or documented roost tree. Summer 2 habitat does not apply to the northern long-eared bat because there is no known separation of habitat use by reproductive and non-reproductive individuals during the summer season.

- "*Swarming habitat*" refers to suitable roosting, foraging, and commuting habitat for the covered species that is within a determined distance of a known hibernaculum.

- "*Swarming 1 habitat*" refers to swarming habitat within 10 miles of a P1 or P2 Indiana bat hibernaculum.

- "*Swarming 2 habitat*" refers to swarming habitat within five miles of a P3 or P4 Indiana bat hibernaculum and any northern long-eared bat hibernaculum.

- "*Timeframe*" refers to the range of dates when the covered species are expected to go through certain phases of their annual life cycles, such as hibernating, swarming, or giving birth and raising young. These timeframes are used to determine if a particular habitat type is expected to be occupied or unoccupied. The relevant timeframes for the covered species can be found in Appendix L of the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines.

- "*Unoccupied*" refers to the timeframe in which suitable habitat is not expected to be used by the covered species. This terminology is important when evaluating RFCOs and determining the appropriate conservation multiplier. See Appendix F for more information on when habitat types are occupied and unoccupied and the conservation ratios associated with those time periods.

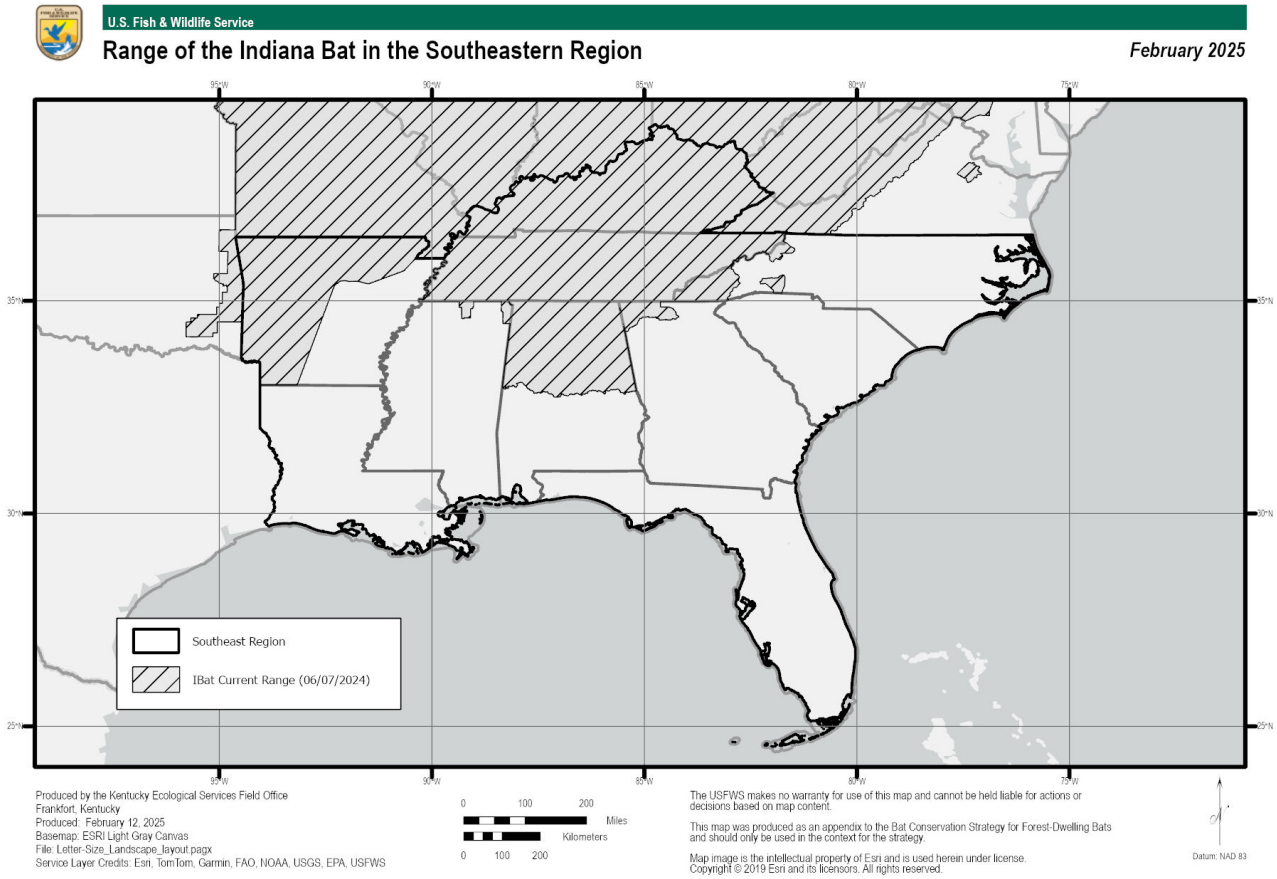
- "*Year-round Active Range*" refers to the portion of the range of the northern long-eared bat where the species occupies suitable summer habitat throughout the calendar year. Arkansas is not located with the year-round active range of the northern long-eared bat.

Appendix B: Relevant Authorities of the U.S. Fish and Wildlife Service

The Service will implement this Conservation Strategy where its authorities allow as a means of enhancing the conservation and recovery of the covered listed bat species in Arkansas. Authorities that directly support the development and implementation of this Conservation Strategy include:

- The Endangered Species Act (16 U.S.C. 1531 et seq.) (ESA) provides (section 5) that, "The Secretary…shall establish and implement a program to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species…" and "shall utilize land acquisition and other authority under the Fish and Wildlife Act, as amended, and the Migratory Bird Conservation Act, as appropriate". Section 7(a)(1) of the ESA further directs Federal agencies to "utilize their authorities in furtherance of the purposes of this Act [ESA] by carrying out programs for the conservation of endangered species and threatened species." Additionally, section 7(a)(2) of the ESA directs Federal agencies to "ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species."
- The Fish and Wildlife Act of 1956 (16 U.S.C. 742a. et seq.) provides that the Secretary shall "...take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources…."
- The Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) states that the Secretary is authorized "to provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, resources thereof, and their habitat…"

Appendix C: Status of the Indiana Bat in Arkansas



Summary of Indiana Bat Status in Arkansas

Arkansas is in the southwest corner of the Indiana bat species range. Of the 53 Priority 2, 150 Priority 3 and 213 Priority 4 hibernacula identified in the Indiana Bat Recovery Plan, 4, 12 and 18 hibernacula are identified as being in Arkansas, respectively. However, multiple new hibernacula have been identified since the Recovery Plan was written and the 2024 Indiana bat population estimate in Arkansas has increased at a greater rate than any other state. All newly identified hibernacula are located within the Ozark Mountain region of Arkansas. Summer records for the species are closely aligned with areas containing sufficient forest cover to support summer roosting behavior. Despite the arrival of white-nose syndrome in 2012, Arkansas has not documented a significant winter population decline, and it appears that many of the Indiana bat summer colonies that existed pre-WNS remain occupied by the species. For further information on the Indiana bat, visit the U.S. Fish and Wildlife Service website at https://www.fws.gov/species/indiana-bat-myotis-sodalis.

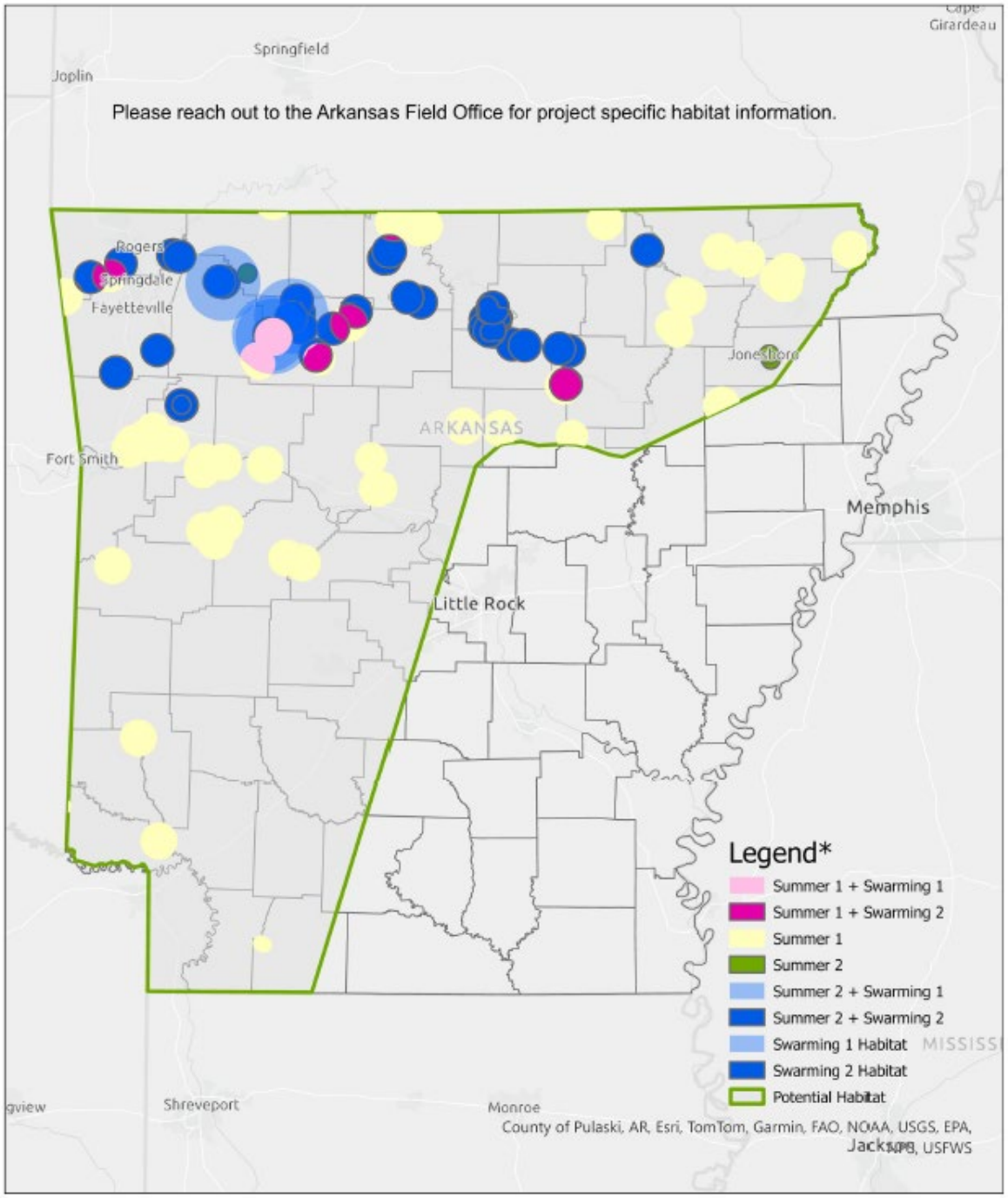
Known Habitat Features for Indiana Bats in Arkansas

This summary outlines known habitat features utilized by the Indiana bat in Arkansas, based on current species occurrence data:

- **Summer Colonies: 191** summer habitat occurrences have been documented. This includes 133 maternity records compiled from mist net captures, acoustic detections, and verified maternity roosts and 58 non-maternity records of solitary males and non-reproductive females.
- **Hibernacula: 61** documented hibernacula have been identified among the caves, mines, or cave-like features where bats could hibernate during the winter months. This includes 4 Priority 1 and 2 hibernacula that contain adjacent Swarming 1 habitat and 30 Priority 3 and 4 hibernacula the contain adjacent Swarming 2 habitat.

U.S. Fish & Wildlife Service

Known Indiana Bat Habitat in Arkansas *September 2025*



Note: This map is based on species occurrence information and is subject to change as new data becomes available. Please contact our office at arkansas_ES_clearance@fws.gov to ensure you are working with the most current version.

*For an explanation of terms please see the Arkansas Bat Conservation Strategy.

0 250 Miles

0 250 Kilometers

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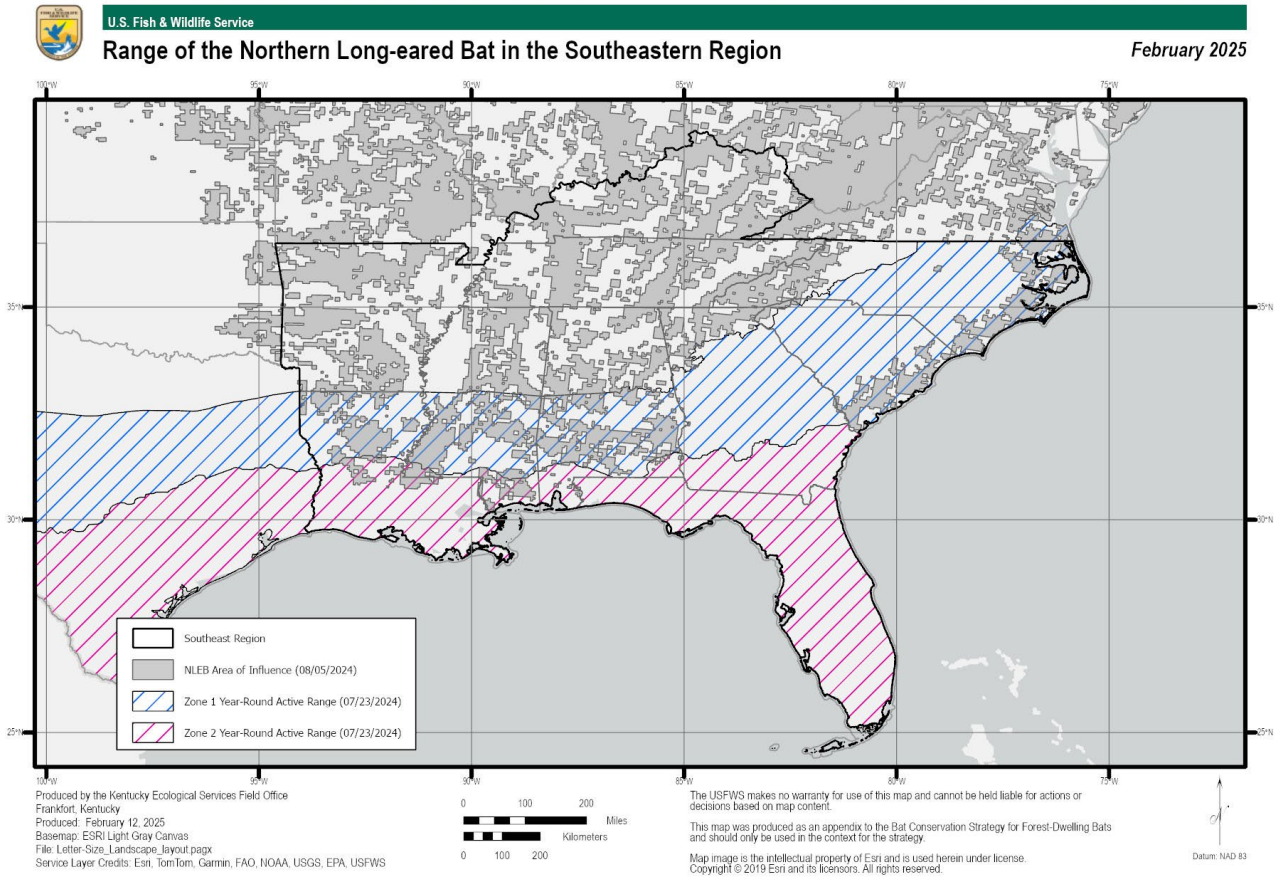
This map was produced as an appendix to the Arkansas Bat Conservation Strategy and should only be used in the context of the strategy.

Datum: NAD 83

Appendix D: Status of the Northern Long-Eared Bat



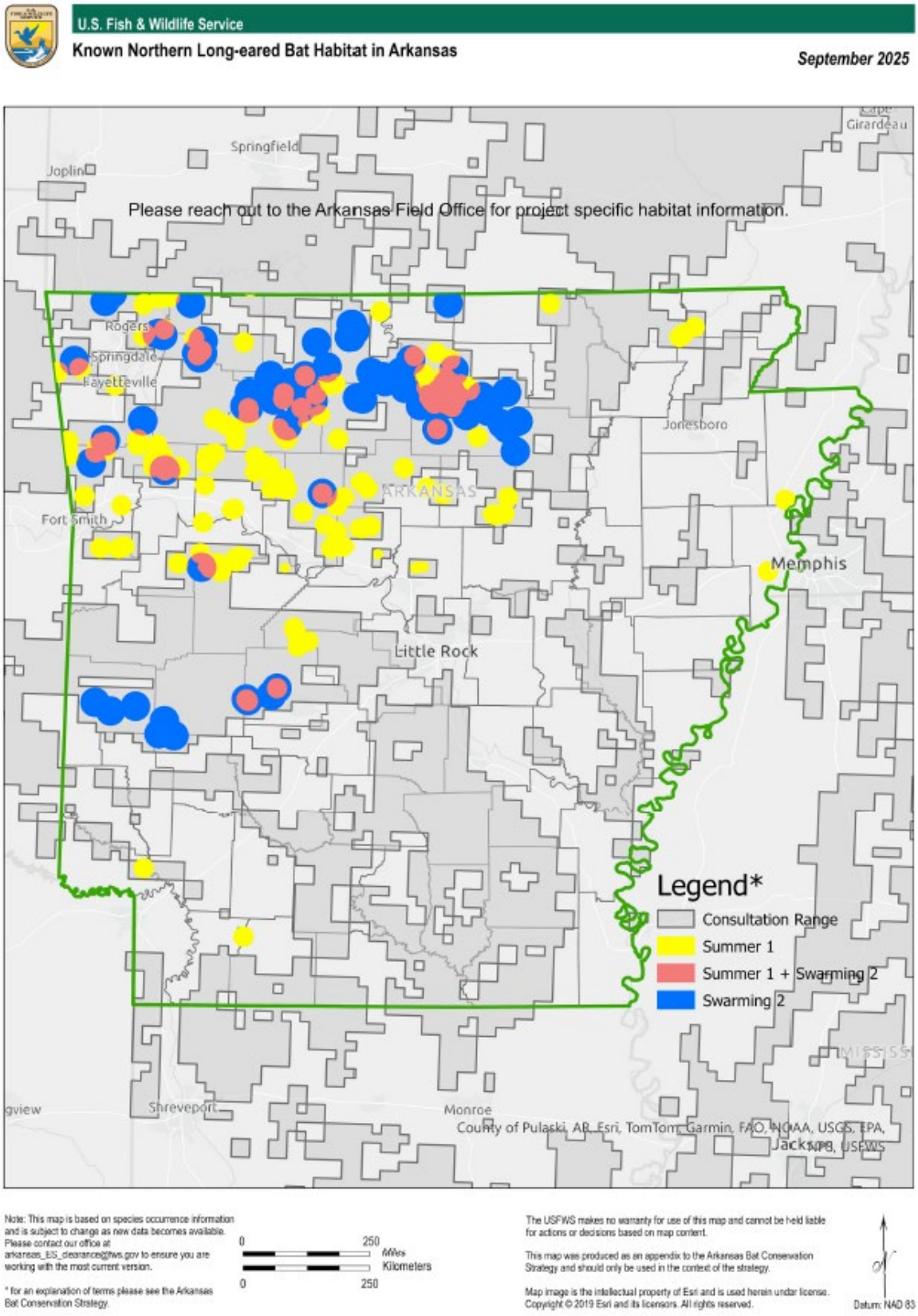
Summary of Northern Long-eared Bat Status in Arkansas

The northern long-eared bat is present year-round in Arkansas. During winter, these bats hibernate in caves, mines, or cave-like features. Estimating populations of northern long-eared bats in Arkansas from winter counts has been challenging due to the bats' tendency to hibernate in cracks and crevices. In the summer occupancy season, northern long-eared bats roost under bark, in tree cavities, or in crevices of both live and dead trees. They will also roost in man-made structures, such as bridges and abandoned buildings, and in natural rock shelters and crevices in cliff lines. Prior to the arrival of white-nose syndrome (WNS) in 2012, the northern long-eared bat was one of the most common bat species encountered during the summer in Arkansas. However, the first noticeable WNS effects appeared in 2012, which led to significant declines in Arkansas northern long-eared bat populations. Spring staging and fall swarming are significant time periods for mating and migration to hibernacula. As such, forested habitat is crucial for roosting, foraging, and commuting behavior. For further information on the northern long-eared bat, visit the U.S. Fish and Wildlife Service website athttps://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis.

Known Habitat Features for Northern Long-eared Bats in Arkansas

This summary outlines known habitat features utilized by the northern long-eared bat in Arkansas, based on current species occurrence data:

- **Post-WNS Summer Colonies: 728** occurrences have been documented since 2014 during the summer occupancy timeframe, including mist net captures, acoustic detections, and verified maternity roosts.
- **Hibernacula: 96** caves, mines, or cave-like features have been documented as hibernacula during the winter months.
- **Bridges/Culverts: 2** man-made structures have been documented that provide roost sites for northern long-eared bats.


U.S. Fish & Wildlife Service
Known Northern Long-eared Bat Habitat in Arkansas
September 2025
Please reach out to the Arkansas Field Office for project specific habitat information.
Springfield
Joplin
Rogers
Springdale
Fayetteville
Jonesboro
ARKANSAS
Fort Smith
Memphis
Little Rock
Shreveport
Monroe
Legend*
Consultation Range
Summer 1
Summer 1 + Swarming 2
Swarming 2
County of Pulaski, AR, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS
Note: This map is based on species occurrence information and is subject to change as new data becomes available. Please contact our office at arkansas_ES_clearance@fws.gov to ensure you are working with the most current version.
* for an explanation of terms please see the Arkansas Bat Conservation Strategy.
0
250
Miles
Kilometers
0
250
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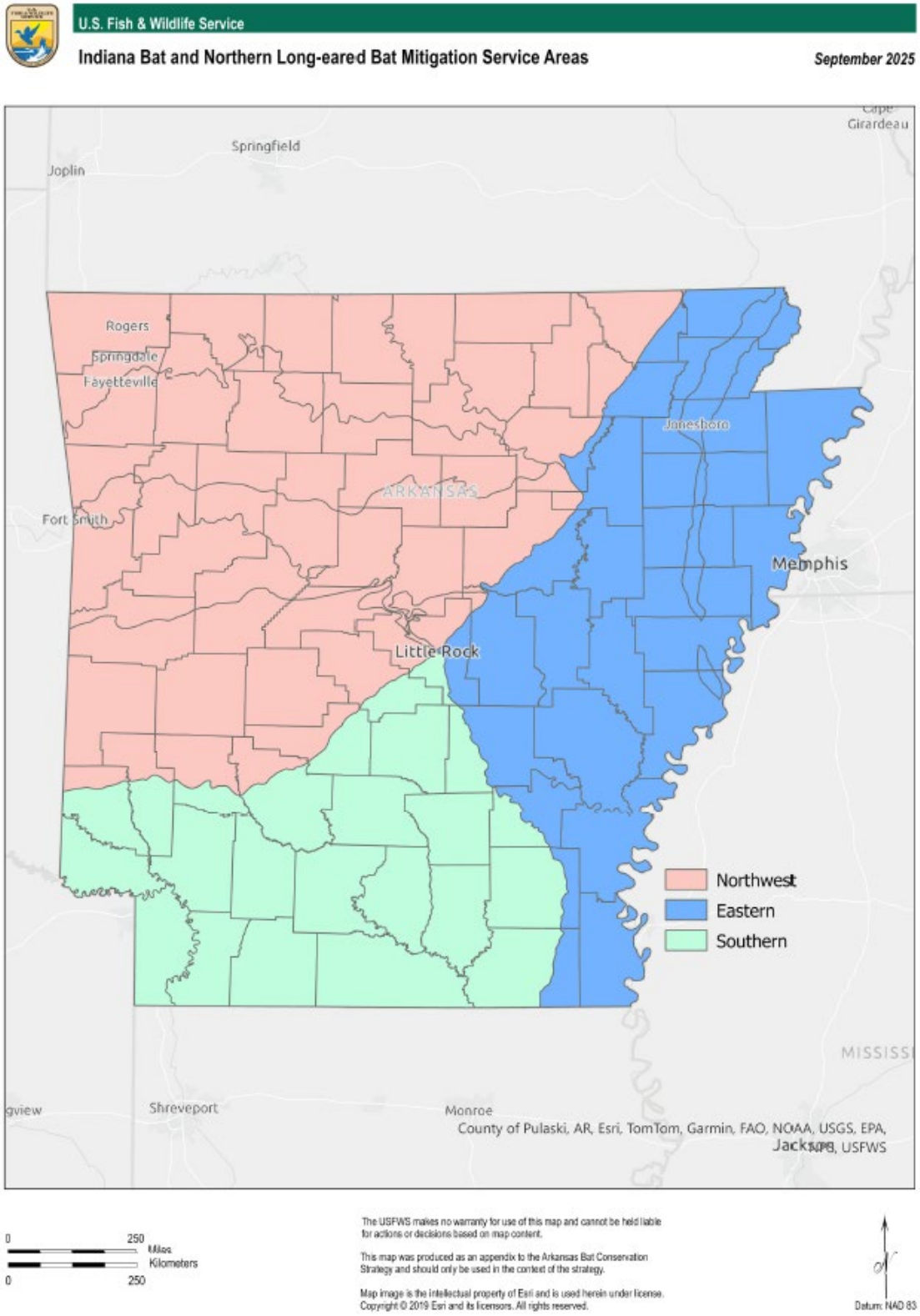
Datum: NAD 83

Appendix E: Service Areas and Priority Conservation Areas



Service Area	PCA Name	Description
Eastern/Northwest	Black River PCA	The assemblage of summer habitat associated with the Black River watershed (67% of known Indiana bat maternity colonies in Arkansas).
Northwest	Karst Region PCA	The assemblage of hibernacula, swarming and summer habitat in Franklin, Crawford, Carroll, Madison, Newton, Searcy, Boone, Marion, Stone, Izard, Fulton, Sharp, Independence and Van Buren Counties that represent greater than 95% of known Indiana hibernacula and swarming sites.
Southern	Red River PCA	The assemblage of summer habitat associated with documented Indiana summer use in Columbia, Lafayette, Sevier, Little River, Howard, Nevada and Hempstead Counties.
Northwest	Ouachita Region PCA	The assemblage of hibernacula, swarming habitat, and summer habitat in Sebastian, Scott, Perry, Garland, Saline, Montgomery, Polk, Pike, Clark, Hot Springs and Logan Counties that are indicative of providing refuge habitat for surviving northern long-eared bats in Arkansas post WNS.

Appendix F: Conservation Multiplier Table

Habitat Type Impacted	Hibernation[1]	Summer Occupancy/ Spring Staging[2]	Pup Season[3]	Summer Occupancy	Fall Swarming
	Nov 16-March 14	March 15-April 30	May 15-July 31	March 15-September 30	Aug 16-Nov 15
	Potential, Summer, & Swarming unoccupied	Potential & Summer occupied			Swarming occupied
Summer (1 or 2) and Swarming 1	2.5	3.0	4.0	3.0	3.5
Summer (1 or 2) and Swarming 2	2.0	2.5	3.5	2.5	3.0
Swarming 1	1.5	2.0	3.0	2.0	2.5
Swarming 2	1.0	1.5	2.5	1.5	2.0
Summer 1	1.5	2.0	3.0	2.0	2.0
Summer 2	1.0	1.5	2.5	1.5	1.5
Potential	0.5	1.0	2.0	1.0	1.0

Appendix G: Calculation Worksheet and Example Calculations

This sample calculation worksheet is provided to help project proponents estimate the potential conservation cost for a project that will result in the removal of suitable forest habitat for one or more of the covered species. The final conservation acres required will be verified by the Service prior to completion of the project review process.

Species	Habitat Type Impacted	Impact (acres)	Conservation Multiplier	Conservation Acres Required

Conservation Acres= (acres impacted) x (conservation multiplier)

Once the conservation acres are calculated, proponents can explore the available Recovery-focused Conservation Options to determine the best approach for their project.

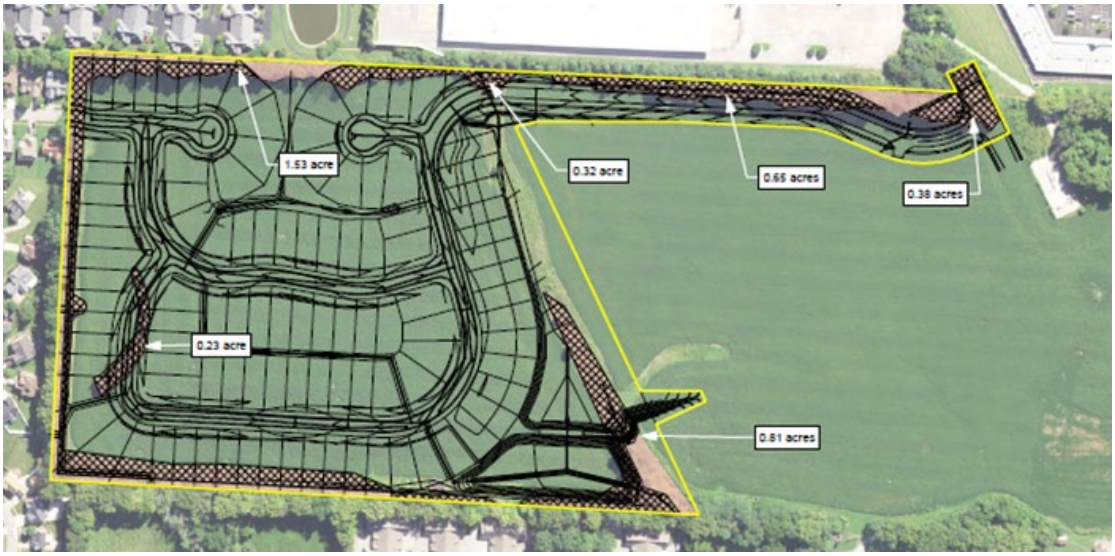
ABF option= (conservation acres) x (ABF land value rate)

Conservation Bank option: (conservation acres) x (conservation bank land value rate)

For those considering proponent responsible mitigation, please contact the AFO to discuss. The following examples have been provided to assist project proponents in calculating their conservation cost when electing to use one of the recovery-focused conservation options. The

examples below are specific to determining the ABF cost; however, they could also be used to identify the amount of in-kind conservation for proponent responsible mitigation that would be required or amount of credits that would be required if utilizing a species conservation bank. These examples are not intended to cover every possible scenario. Proponents are encouraged to contact the Service at any time to discuss the specific details of a project.

EXAMPLE A



The Indiana bat was determined to be the only species that would be adversely affected by the proposed project. The project is in an area of habitat determined to be "Potential" (i.e., un-surveyed) and would be removed between November 16 – March 14. The total amount of habitat removal is 3.73 acres. See below for worksheet table and ABF calculation.

Species	Habitat Type Impacted	Impact (acres)	Conservation Multiplier	Current Rate/Acre	ABF Contribution Amount
Indiana bat	Potential	3.73	0.5	$4,110[2]	$7,665.15

3.73 (acres impacted) x 0.5 (conservation multiplier) x $4,110(current USDA per acre rate) = $7,665.15

[2] ABF land value rate is based on the current average land value of farm real estate in Arkansas published annually by the U.S. Department of Agriculture in the Land Values and Cash Rents document. ABF land value rates are update annually on Sept 1st of each year.

EXAMPLE B

The Indiana bat and northern long-eared bat were determined to be the species that would be adversely affected by the proposed project. The project is in an area of habitat determined to be "Summer 1" for the Indiana bat and "Potential" for the northern long-eared bat and would be removed between August 1 – October 15. The total amount of habitat removal is 1.32 acres.

Species	Habitat Type Impacted	Impact (acres)	Conservation Multiplier	Current Rate/Acre	IBCF Contribution Amount
Indiana bat	Summer 1	1.32	2	N/A	N/A
Northern long-eared bat	Potential	1.32	1	N/A	N/A

Use the highest conservation ratio, which is determined to be two (2) to appropriately account for both species.

Species	Habitat Type Impacted	Impact (acres)	Conservation Multiplier	Current Rate/Acre	IBCF Contribution Amount
Indiana bat	Summer 1	1.32	2	$4,110[3]	$10,850.40
Northern long-eared bat	Potential				

1.32 (acres impacted) x 2 (highest conservation multiplier) x $4,110 (current USDA per acre rate) = $10,850.40

[3] ABF land value rate is based on the current average land value of farm real estate in Arkansas published annually by the U.S. Department of Agriculture in the Land Values and Cash Rents document. ABF land value rates are update annually on Sept 1st of each year.