

Conservation Measures for Projects in Kentucky

U.S. Fish and Wildlife Service Kentucky Ecological Services Field Office

Conservation measures are actions taken to avoid and minimize potential effects to federally listed species and designated critical habitat from a proposed project or activity. The list below includes potential conservation measures to consider when planning and implementing common development and management activities. These conservation measures may eliminate or reduce adverse effects to listed species and critical habitat that may result from the project or activity.

Forest Management and Tree Removal/Trimming

- Avoid removal and trimming of trees greater than 3 inches in diameter at breast height (DBH) that could provide habitat for tree-roosting bats.
- If trees greater than 3 inches in DBH must be removed or trimmed, avoid these impacts from April 1 to November 15 when tree-roosting bats could be present.
- If trees greater than 3 inches DBH must be removed or trimmed from April 1 to November 15, avoid impacts during the bat pup season from May 15 to July 31.
- Retain tree snags with exfoliating bark that could provide habitat for tree-roosting bats.
- Avoid removal of suitable Indiana bat primary maternity roost trees (PMRTs) and forested habitat immediately surrounding a PMRT. A PMRT is a dead tree or snag that is 9 inches or greater in diameter at breast height and has loose or exfoliating bark, cracks, crevices, and/or hollows. A live tree may also qualify if it contains hollows or dead portions with loose or exfoliating bark, cracks, and/or crevices. If a small number of PMRTs must be removed (e.g., ≤ 10), conduct an emergence survey of the tree in accordance with Appendix H of the most current version of the [Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines](#).
- Create forest openings of various sizes that promote herbaceous understory plant communities for the monarch butterfly and other pollinators.
- Use buffer areas for forests adjacent to roadways, mow infrequently, and create native plant communities to improve transition zones between forests and roads for the monarch butterfly and other pollinators.

Prescribed Fire

- Conduct prescribed fires in accordance with Kentucky Outdoor Burning Laws and/or under the required certifications provided through the Kentucky Prescribed Fire Council and Kentucky Division of Forestry.
- Ensure prescribed fires are low to moderate intensity (i.e., flame lengths ≤ 8 feet high) to minimize impacts to tree-roosting bats.
- Avoid prescribed fire during the bat pup season from May 15 to July 31.
- Protect tree snags that could be used by bats by moving fuels away from the base.
- Only conduct prescribed fire when temperatures are $\geq 40^\circ$ F.
- Avoid prescribed fire near caves, sinkholes, quarries, mines, and other cave-like features when smoke could enter the feature.

- Use prescribed fire to maintain conditions important for the monarch butterfly and other pollinators.

Activities near Caves/Sinkholes, Quarries, Mines, Clifflines, and Cave-like Features

- Avoid impacts to these features to avoid and minimize potential effects to roosting bats.
- If any of these features are present and may be impacted, conduct a Phase 1 Habitat Assessment to determine if the feature is potential bat habitat in accordance with Appendix H of the most current version of the [Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines](#).
- Avoid blasting, drilling, boring, and other activities that generate significant noise and vibrations (i.e., rock trenching, hoe ramming, jack hammering, etc.) near these features. If drilling or boring is required, conduct preliminary evaluations to ensure the activity is unlikely to encounter these features.
- Avoid tree removal around openings to these features.

Bridge and Culvert Maintenance, Repair, and Replacement

- If bridges and/or culverts are present, conduct an assessment to determine if the structure is potential bat habitat in accordance with Appendix K of the most current version of the [Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines](#).
- Perform bridge and culvert maintenance, repair, removal, and replacement from November 16 to March 31 when bats are unlikely to be present.
- For bridge replacements, consider installing a single-span bridge or reducing the number of in-stream piers.
- During bridge repairs and removal, use containment under the bridge deck to catch debris and prevent any materials from entering streams. Promptly remove any materials that enter streams.
- Install or replace culverts at the same grade as the stream channel to maintain aquatic organism passage. Bury culvert bottoms or use bottomless culverts to maintain stream substrate characteristics within the culvert.

Building and Structure Maintenance and Removal

- Limit maintenance, modification, and removal of buildings and other human-made structures (e.g., barns, sheds) and intentional exclusion of bats from these structures to August 1 to March 31 when bats are unlikely to be present.
- If work must be done between April 1 and July 31, search all accessible areas of the structure for bats prior to any work. If bats are observed in the structure or emerge from the structure during work, delay or stop the activity and contact the KFO for assistance.

Noise and Lighting

- Avoid chronic or intense night-time noise above current ambient levels in suitable forested habitat from April 1 to November 15 when tree-roosting bats could be present. If noise-generating activities must occur during this time, avoid impacts during the bat pup season from May 15 to July 31.
- Avoid the use of artificial lighting within 1,000 feet of forested habitat. If lighting is required, direct lighting away from forested habitat and/or use downward-facing, full cut-off lens lights.

Activities near Streams, Wetlands, and other Waterbodies

- Avoid and minimize impacts to streams and other waterbodies by implementing Best Management Practices (BMPs) associated with federal, state, and/or local permits, agency standards, or other standard BMPs used for similar activities. Examples include BMPs associated with U.S. Army Corps of Engineers permits, Kentucky Division of Water Water Quality Certifications, and Kentucky or National Pollution Discharge Elimination System permits.
- Store all vehicles, equipment, and hazardous materials (e.g., fuel, oils, chemicals) outside the 100-year floodplain of streams and in upland areas away from wetlands and other waterbodies. Service, fuel, and clean vehicles outside of these areas.
- Avoid heavy equipment use within streams.
- Conduct in-stream work from stream banks or existing infrastructure (e.g., road, bridge, culvert).
- Use existing stream crossings (e.g., bridges, culverts) if equipment must access both sides of a stream. If no existing crossings are available, cross the stream perpendicular to flow at an existing ford or a location with shallow, stable, rock substrates and minimal flow.
- If heavy equipment use is required within a stream, perform work during low-flow or no-flow conditions and use temporary work pads, timber mats, or other protective structures. Use clean riprap with no earth fill and/or other natural materials when installing in-stream structures. Maintain stream flow and aquatic organism passage at all times. Use cofferdams or other structures to isolate work areas from the stream. Remove all temporary structures as soon as possible following completion of work, and restore streambed to original conditions.
- Schedule in-stream work to avoid environmentally sensitive periods for aquatic species, such as spawning and migration (e.g., March through June for fish species, July 20 to September 10 for Big Sandy crayfish).
- Avoid in-stream dredging and gravel mining.
- For underground utility crossings, utilize horizontal directional drilling or other trenchless techniques to avoid direct impacts to streams.
- Avoid removal of trees and other vegetation along stream banks. If vegetation removal is required, leave stumps and root wads. Remove downed trees and other woody debris from streams.
- Seed/live stake and stabilize all disturbed stream banks and adjacent areas immediately after completion of work. Use native seed mixes and avoid planting non-native invasive species.

Ground Disturbance and Restoration

- Avoid ground disturbance, vegetation removal, and mowing within suitable habitat for listed plant species.
- Avoid changes to hydrologic patterns upgradient of suitable habitat for listed plant species.
- Stockpile removed topsoil and re-spread in disturbed areas after disturbance to maintain potential seed banks for native and/or listed species.
- Thoroughly clean vehicles and equipment after each use, and remove dirt and plant debris prior to leaving a site to prevent transport of invasive plant species to other areas.

- Use native seed mixes free of invasive and aggressive non-native species when revegetating disturbed areas.
- Maximize native flowering plant diversity across bloom periods for the monarch butterfly and other pollinators. Use seed mixes that include a minimum of 9 total species of native flowering plants, including 3 species per each blooming period of April-June, June-July, and August-October. Use only native milkweed species and avoid using tropical milkweed or other non-native species. Recommended plant list: https://fw.ky.gov/Wildlife/documents/Monarch_Planting_Brochure.pdf.
- Follow regional planting guides specific to ecoregion, and source seeds as locally as possible, with consideration for climate adaptation.
- Schedule mowing to enhance floral resources.

Herbicide and Insecticide Use

- Utilize targeted application methods when possible, such as spot-spraying, hack-and-squirt, basal bark, injections, or cut-stump. Restrict herbicide use in forested areas to these targeted methods from April 1 to November 15 when tree-roosting bats could be present.
- Mix and apply herbicides according to label specifications.
- Herbicide application should be performed by or under supervision of a licensed applicator certified in the appropriate state category that covers the herbicide application.
- Apply herbicides when weather conditions will minimize drift.
- Use equipment and techniques designed to ensure maximum control of the spray swath with minimum drift.
- Avoid applications during unstable, unpredictable, or changing weather patterns.
- Do not apply herbicides during rainy periods or during the 48-hour interval prior to rainfall when predicted with a 20 percent or greater probability by local forecasters.
- Discontinue liquid applications when the temperature reaches or exceeds 95° F.
- Do not use aerial or broadcast herbicide applications within or adjacent to streams, ponds, and other water sources. Mix and load chemicals away from these features.
- When conducting aerial spraying, apply herbicides close to targeted species and below the canopy height of surrounding trees to minimize risk of application to adjacent, non-target trees that could be used by tree-roosting bats.
- Avoid spraying between sunset and sunrise to avoid potential impacts to foraging bats.
- Do not conduct aerial applications of liquid herbicides when surface wind speeds exceed 5 miles per hour, in areas of fog, during periods of temperature inversion, or when other conditions exist that the label identifies as restricted.
- Do not apply pellets when surface wind speeds exceed 10 miles per hour or on frozen or water-saturated soils.
- Limit insecticide exposure where possible, using established Integrated Pest Management guidance and/or approved Pesticide Use Permits.