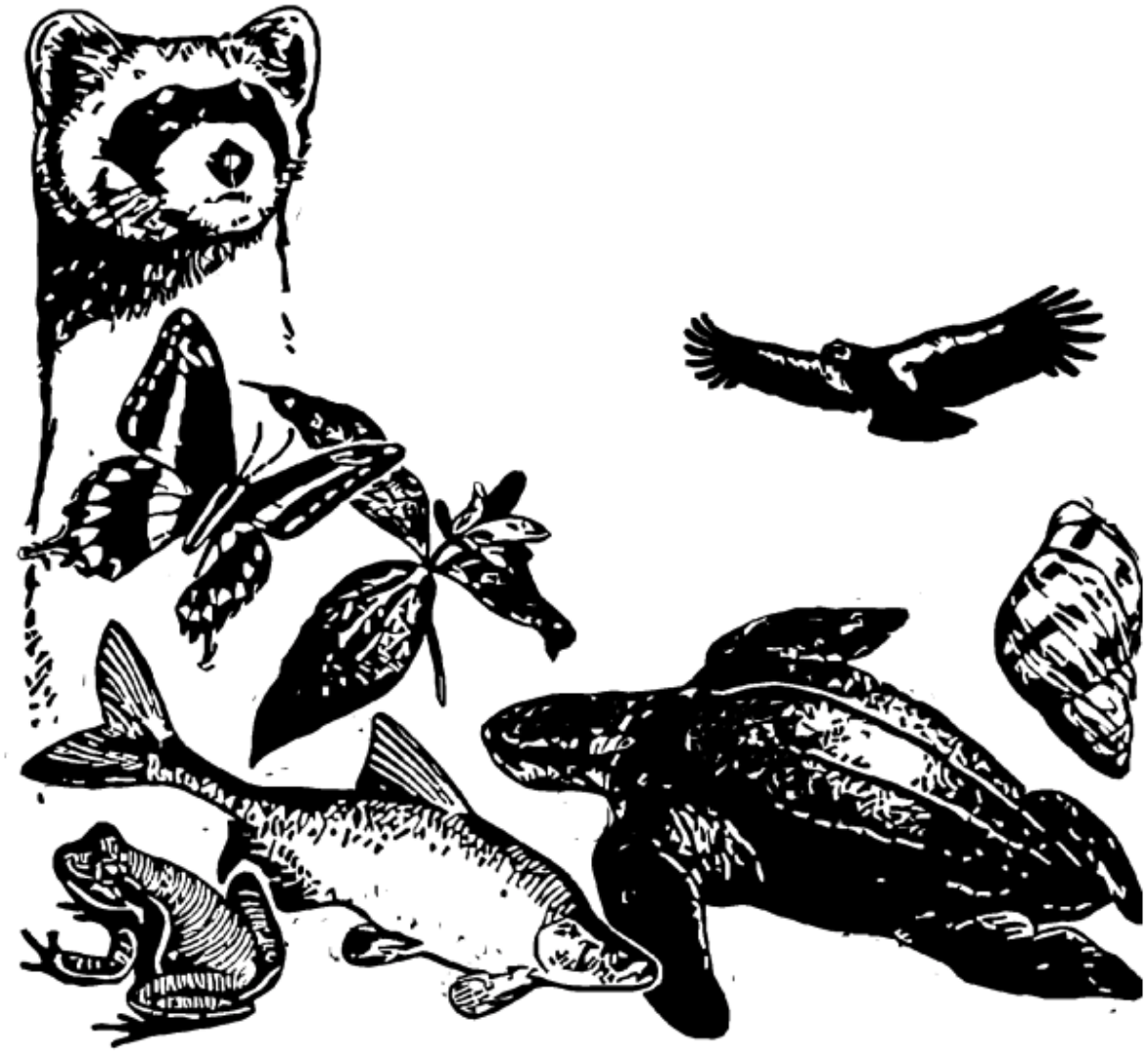
**U.S. Fish & Wildlife Service**

# *General Project Design Guidelines (11 Species)*

Generated October 03, 2023 12:57 AM UTC,  IPaC v6.98.0-rc2



IPaC - Information for Planning and Consultation (https://ipac.ecosphere.fws.gov/): A project planning tool to help streamline the U.S. Fish and Wildlife Service environmental review process.

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## Species with general design guidelines

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- Cumberland Bean (pearlymussel) *Villosa trabalis*
- Cumberland Darter *Etheostoma susanae*
- Cumberlandian Combshell *Epioblasma brevidens*
- Fluted Kidneyshell *Ptychobranchus subtentus*
- Gray Bat *Myotis grisescens*
- Indiana Bat *Myotis sodalis*
- Littlewing Pearlymussel *Pegias fabula*
- Northern Long-eared Bat *Myotis septentrionalis*
- Tan Riffleshell *Epioblasma florentina walkeri (=E. walkeri)*
- Virginia Big-eared Bat *Corynorhinus (=Plecotus) townsendii virginianus*

## Species without general design guidelines available

- Cumberland Elktoe *Alasmidonta atropurpurea*
- Cumberland Rosemary *Conradina verticillata*
- Monarch Butterfly *Danaus plexippus*
- Tricolored Bat *Perimyotis subflavus*
- Virginia Spiraea *Spiraea virginiana*
- White Fringeless Orchid *Platanthera integrilabia*
- Whooping Crane *Grus americana*

# General Project Design Guidelines - Indiana Bat and 17 more species

Published by Kentucky Ecological Services Field Office for the following species included in your project

- Indiana Bat *Myotis sodalis*
- Cumberlandian Combshell *Epioblasma brevidens*
- Cumberland Elktoe *Alasmidonta atropurpurea*
- Tricolored Bat *Perimyotis subflavus*
- Cumberland Rosemary *Conradina verticillata*
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Four of the bat species found in Kentucky are listed under the Endangered Species Act: the Indiana bat (*Myotis sodalis*), the northern long-eared bat (*Myotis septentrionalis*), the gray bat (*Myotis grisescens*), and the Virginia big-eared bat (*Corynorhinus townsendii virginianus*). Records for Indiana bats, northern long-eared bats, and gray bats occur in all areas of the state, and these species are considered potentially present in areas in which they have not been previously documented. Virginia big-eared bat are found in a specific region of eastern Kentucky.

All four species winter in caves, underground mines, or other similar structures. Gray bats and Virginia big-eared bats also use these structures and other structures, such as rockshelters and other karst features, during the summer for roosting and forming maternity colonies. To address the potential for impacts to winter habitat for these four bat species and summer habitat for the gray bat and the Virginia big-eared bat, we recommend conducting habitat assessments to identify any suitable habitat features in the action area of the proposed project. This action area typically includes a buffer around the footprint of the project. This buffer can vary in size depending on the actions associated with the proposed project. Any features identified should be assessed following the process described in the most current survey guidelines for the species at: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html. Because these species may also occasionally roost in buildings, bridges, culverts, and other human-made structures, we recommend inspecting these structures for the presence of bats or signs of bat use prior to demolition. If bats are found or suspected to be using a structure, further coordination with the Service may be necessary.

In the summer, Indiana bats and northern long-eared bats utilize a variety of forested habitats, including riparian forests, bottomlands, and uplands, for both summer foraging and roosting. Females give birth and raise their young in trees occupied by maternity colonies. During the fall “swarming" period, these species occupy the forested habitat around the hibernacula where they mate and acquire additional fat reserves prior to hibernation. They also utilize this habitat during spring emergence before migrating to their summering areas. Suitable roost trees for Indiana bats are greater than 5 inches diameter at breast height (DBH), can be living or dead, and exhibit any of the following characteristics: exfoliating bark, broken limbs, broken tops, cracks, and crevices. Suitable habitat for northern long-eared bats include habitat suitable for Indiana bats as well as trees as small as 3 inches DBH and cavities in trees. We recommend the following options to address potential effects to the Indiana bat and northern long-eared bat as a result of impacts to roosting habitat:

- The project proponent can modify the proposed project to avoid impacts to suitable roosting and foraging habitat. A habitat assessment may be useful in determining if suitable summer roosting or foraging habitat is present in the action area of the proposed project.

- The project proponent can conduct a survey (acoustical or mist-net) to determine the presence or likely absence of the species in the project area. These presence/absence surveys must be conducted by a qualified biologist with the appropriate collection permits and in accordance with our most current survey guidance. If any federally-listed bats are captured, we request written notification of such occurrence(s) and further

coordination and consultation. Surveys must be conducted during late spring to early summer between the dates specified in the survey guidance. Results from surveys are valid during the survey season in which they are collected, through the survey season the following year, until the beginning of the survey season of the next following year. Survey results are not recommended to support probable absence of a bat species in an area and during a timeframe in which presence of the species has already been documented ("known" habitat), unless it is "outer-tier maternity" habitat. Survey guidance and distribution of known records can be found at: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is enough supporting information to concur with the determination.

- For federal projects, the federal action agency can request formal section 7 consultation with the submission of a Biological Assessment describing the action and evaluating the effects of the action on the listed species in the project area. After formal consultation is initiated, the Service has 135 days to prepare a Biological Opinion that analyzes the effects of the action on the listed species and identifies actions to minimize those effects.

- For non-federal projects, section 10(a)(1)(B) of the ESA establishes a process for permitting the taking of listed species that is incidental to otherwise lawful non-Federal activities (i.e., an incidental take permit or ITP). Habitat Conservation Plans (HCPs) are planning documents required as part of an application for an incidental take permit. They describe the anticipated effects of the proposed taking, how those impacts will be minimized or mitigated, and how the HCP is to be funded. HCPs can apply to both listed and non-listed species, including those that are candidates or have been proposed for listing. However, the incidental take permit will only cover species listed as endangered or threatened under the ESA. Additional information about HCPs can be found on the Service's website at: http://www.fws.gov/endangered/what-we-do/hcp-overview.html

- In certain areas, potential effects to the northern long-eared bat may be excepted under the Final 4(d) Rule that the Service published for the species on January 14, 2016. This 4(d) Rule identifies certain types of take that is prohibited and establishes specific conservation measures for tree removal activities that, if adhered to, would not result in prohibited incidental take. If the proposed project is in a location where incidental take would not be prohibited, the "official species list" attached to the IPaC-generated letter will include a condition for northern long-eared bat that reads: "The specified area includes areas in which incidental take would not be prohibited under the 4(d) rule." Incidental take in these locations would be covered under the Service's January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule. To use the programmatic BO to address effects to the northern long-eared bat, project proponents should use the "Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency" Determination Key in IPaC. This key is accessed by clicking on "Start

Review" under the "What's Next" heading on the right side of the screen on the IPaC "Project Home" page. If there is no condition present for northern long-eared bat in the "official species list," the key cannot be completed. Please contact the Kentucky Field Office for further coordination.

- The project proponent may choose to offset impacts resulting from the removal of Indiana bat and/or northern long-eared bat forested habitat by providing a contribution to the Imperiled Bat Conservation Fund (IBCF). By choosing this option, cooperators gain flexibility with regard to the removal of the habitat. In exchange for this flexibility, the cooperator provides recovery-focused conservation benefits to the species through the implementation of conservation measures that are described in the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky found at: http://www.fws.gov/frankfort/indiana_bat_procedures.html. More information about the conservation benefits provided by the IBCF can be found at: http://knlt.org/ ibcf/.

Though only Indiana bats and northern long-eared bats roost in trees, forested habitat is important to all four species for foraging and commuting purposes. Indiana bats and gray bats commonly utilize forested corridors along streams, while northern long-eared bats tend to forage more in the interior of forests, and Virginia big-eared bats along forested edges. Forest removal associated with projects can impact bat behavior by eliminating foraging areas and by rendering foraging areas unusable by severing connections between habitat. Modifying or degrading habitat to an extent that results in significant impairment of behavioral patterns could qualify as "take" under the ESA. The effects of forest habitat removal on the landscape should be evaluated for potential impacts to bat foraging and commuting behavior.

All four species of bats forage on insects. Gray bats and Indiana bats, in particular, often forage over strongly intermittent to larger streams, rivers, lakes, and ponds, consuming insects that spend the larval phase of the life cycle in water. These insects can be negatively affected by excessive sediment and contaminants in the water. We recommend using appropriate Best Management Practices (BMPs) to minimize impacts to the water quality within and downstream of the project area to protect these important foraging resources.

In summary, to address potential effects to federally-listed bats in Kentucky, please provide the Service with information about the following potential habitat features in the action area of the proposed project:

- caves, rockshelters, abandoned mine portals, or similar features;
- buildings, bridges, or culverts;
- forested habitat; and
- streams, rivers, lakes, ponds, or wetlands.

Please describe how the proposed project may impact these features and any measures proposed to reduce impacts.

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The Tennessee River drainage, which includes the Cumberland River, contains the most diverse mussel fauna in North America and has also experienced great declines. The reach of the Cumberland River from below Cumberland Falls to the Tennessee State Line has lost 49% of the species historically recorded there. The completion of Wolf Creek Dam in 1950 was detrimental to freshwater mussel populations when it inundated 100 miles of mainstream Cumberland River and miles of tributaries and altered conditions downstream. Anthropogenic activities, especially stream channelization and water pollution from mineral extraction, continue to impact mussel populations in the Cumberland River drainage.

The species in the table below will appear on an IPaC-generated species lists if the project area you delineated for the proposed project is located within the Cumberland drainage below Cumberland Falls. The table lists streams and rivers in which these species are believed to be extant. There may be additional, currently unknown, occurrences of the species.

| | **Streams and Rivers in Kentucky in With Recent Records of the Species** |
|---|---|
| Cumberlandian combshell (*Epioblasma brevidens*) | Buck Creek, Big South Fork of the Cumberland River, Rockcastle River (lower) |
| Cumberland bean (*Villosa trabilis*) [1] | Big South Fork of the Cumberland River, Buck Creek, Horse Lick Creek, Little South Fork of the Cumberland River, Rockcastle River, Sinking Creek |
| Fluted kidneyshell (*Ptychobranchus subtentum*) [2] | Big South Fork of the Cumberland River, Buck Creek, Horse Lick Creek, Rock Creek, Little South Fork of the Cumberland River, Otter Creek |
| Littlewing pearlymussel (*Pegias fabula*) | Big South Fork of the Cumberland River, Rockcastle River |
| Slabside pearlymussel (*Pleuronaia dolabelloides*) | Big South Fork of the Cumberland River |
| Tan riffleshell (*Epioblasma florentina walkeri*) [3] | Big South Fork of the Cumberland River, Rockcastle River |

[1] This species has been renamed *Venustaconcha troostensis*.
[2] This species has been renamed *Ptycobranchus subtentus*.
[3] This species has been renamed *Epioblasma walkeri*.

In-channel activities in the rivers listed above may potentially directly or indirectly affect one or more species of mussels. Even projects that do not involve in-channel activities still have the potential to impact listed mussel species and their habitats. Development activities that disturb uplands in watersheds containing listed mussel species can degrade streams and rivers by increasing siltation/sedimentation, introducing pollutants, and/or altering riparian areas. If the proposed project would directly or indirectly impact streams in the range of the Cumberland elktoe, the U.S. Fish and Wildlife Service's Kentucky Field Office (KFO) can assist in

determining the likelihood of species' occurrence in the project area and recommend habitat assessments and/or species surveys.

When practicable, we recommend siting projects to avoid impacting streams and rivers that contain listed mussel species and utilizing methods, such as horizontal directional drilling and clear span bridges, to avoid direct impacts to listed mussel species and their habitats. The following are some general recommendations to minimize indirect impacts to streams and rivers and reduce effects to federally-listed mussels:

- Utilize Best Management Practices to minimize erosion from work areas;
- Limit vegetation removal to minimize impacts to riparian areas;
- Revegetate disturbed areas with native vegetation;
- Use bioengineering techniques to restore disturbance to stream banks;
- Install upland sediment basins, where appropriate, to minimize sediment input into streams and rivers;
- Install detention structures to manage stormwater runoff into streams and river; and
- Minimize the addition of impervious surfaces in the watershed.

When submitting project information to the KFO for review, please include information about streams and rivers in the action area of the proposed project. Describe any proposed activities that would occur in the channel or on the banks and include descriptions of measures proposed to reduce impacts to stream and river habitat.

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Currently, there are eight federally-listed fish species that may occur in Kentucky and should be considered when evaluating project impacts. The table below lists the general Kentucky distribution of these species and describes typical habitat conditions in which they are found. Species occurrence is not limited to areas that contain typical habitat characteristics. The species can potentially be found in any stream of suitable size within its known range.

| | Distribution in Kentucky | Typical Habitat |
|---|---|---|
| Blackside dace | Upper Cumberland River basin (portions of Bell, Harlan, Knox, Laurel, Letcher, McCreary, Pulaski, and Whitley counties).[1] | Headwater streams (generally 1st – 2nd order) with intact riparian zones and stable substrates; generally found near undercut stream banks, woody debris piles, and large rocks; more likely present when stream conductivity levels ≤ 240 µS/cm. |
| Cumberland darter | Upper Cumberland River basin (McCreary and Whitley counties) | Small to medium-sized streams (2nd – 4th order) with pools or shallow runs containing sand, silt, or sand-covered bedrock substrates. |
| Diamond darter | Considered extirpated from Kentucky, but unoccupied critical habitat has been designated in the Green River | Moderate current and clean sand and gravel substrates. |
| Duskytail darter [2] | Big South Fork Cumberland River | Rocky areas in gently flowing shallow pools and runs. |
| Kentucky arrow darter [3] | Upper Kentucky River basin (portions of Breathitt, Clay, Harlan, Jackson, Knott, Lee, Leslie, Owsley, Perry, and Wolfe counties) | Headwater streams (generally 1st – 2nd order) with moderate- to high-gradients and rocky substrates; most often observed near some type of cover—boulders, rock ledges, large cobble, or woody debris piles; more likely present when stream conductivity levels ≤ 250 µS/cm. |
| Palezone shiner | Little South Fork Cumberland River | Flowing pools and runs with clear water and substrates composed of bedrock, cobble, pebble, and gravel mixed with clean sand. |

1 The blackside dace is also known to occur in one drainage in the Kentucky River basin (Perry County).
2 Recent taxonomic research has split this species into four distinct species. The Tuxedo darter (*Etheostoma lemniscatum*) is the species that exists in Kentucky. The Service has not formally recognized these nomenclatural changes; therefore, the duskytail darter is the current taxon recognized under the ESA.
3 The Kentucky arrow darter was listed as threatened under the ESA with a 4(d) rule. The 4(d) rule excepts take of the species resulting from certain categories of activities: channel reconfiguration or restoration, bank stabilization, bridge and culvert removal or replacement, and repair and maintenance of USFS concrete plank stream crossings. Additional criteria for qualifying activities are found at 81 FR 68963.

| | Distribution in Kentucky | Typical Habitat |
|---|---|---|
| Pallid sturgeon | Mississippi River, its oxbows, and embayed potions of major tributaries. | |
| Relict darter | Bayou du Chien drainage, including portions of the mainstem, South Fork Bayou du Chien, Jackson Creek, Cane Creek, and Sand Creek. | Quiet to gently flowing pools, runs, and glides, usually over gravel mixed with sand; species often associated with undercut banks and other cover (woody debris, tree roots). |

A fish species appears on the IPaC-generated species list if the project area input for the proposed project is located in a watershed where federally-listed fish species occur or may potentially occur. The Kentucky Field Office (KFO) can further assist in determining if a listed fish species is known to occur in a specific project area or if a habitat assessment or species survey is necessary to provide more information about the species' potential occurrence.

When practicable, we recommend siting projects to avoid impacting streams and rivers that contain listed fish species and utilizing methods, such as horizontal directional drilling and clear span bridges, to avoid direct impacts to listed fish species and their habitats. In-channel activities may affect federally-listed fish species if they are present in the action area of the proposed project. When in-channel activities cannot be avoided, the KFO can provide further assistance when evaluating the effects of these activities and determining the likelihood that adverse effects and/or take of a federally-listed fish species may occur.

Projects that do not involve in-channel activities may still have the potential to indirectly affect listed fish species and their habitats. Stream degradation is the primary threat to most federally-listed fish species in Kentucky. Development activities that disturb areas in watersheds containing listed fish species can degrade the stream by increased siltation/sedimentation, introduction of pollutants, and/or alteration of riparian areas. The following are some general recommendations to minimize indirect impacts to streams and rivers and reduce effects to federally-listed fishes:

- Utilize Best Management Practices to minimize erosion from work areas;
- Limit vegetation removal to minimize impacts to riparian areas;
- Revegetate disturbed areas with native vegetation;
- Use bioengineering techniques to restore disturbance to stream banks;
- Install upland sediment basins, where appropriate, to minimize sediment input into streams and rivers;
- Install detention structures to manage stormwater runoff into streams and river; and
- Minimize the addition of impervious surfaces in the watershed.

When submitting project information to the KFO for review, please include information about streams and rivers in the action area of the proposed project. Describe any proposed activities that would occur in the channel or on the banks and include descriptions of measures proposed to reduce impacts to stream and river habitat.