MISSOURI DEPARTMENT OF CONSERVATION

Headquarters
2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180
Telephone: 573-751-4115 ▲ www.MissouriConservation.org

JASON A. SUMNERS, Director

February 17, 2026
Lee Litterell
City Administrator
City of Pacific
llitterell@pacificmo.gov
(via electronic mail)

RE: Proposed Data Center in Pacific, within Franklin County, Missouri

Dear Mr. Litterell,

The Missouri Department of Conservation (Department) is constitutionally charged with protecting and managing Missouri's fish, forest, and wildlife resources, including listed and non-listed wildlife, for Missourians to use and enjoy, both today and in the future. To ensure that these resources are sustainable and resilient, the Department often provides technical input on development projects that will help avoid and minimize impacts to fish, forest, and wildlife resources and Department lands in the vicinity of a project area. This letter is in response to your request for Missouri Department of Conservation comments prior to a zoning meeting regarding a proposed data center facility in Pacific, MO. The Department appreciates the opportunity to review and comment on this project. Please consider the following comments:

Following your request for Department comments, our staff conducted a Natural Heritage Review and compiled the attached reports. The initial report provided by our online environmental review tool (naturalheritagereview.mdc.mo.gov) designated the approximate project area under Level Three, signifying the presence of species listed under the Endangered Species Act either within or near the approximate area of the project. The full report lists these present or likely present species as the federal-listed endangered or proposed endangered Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), tri-colored bat (Perimyotis subflavus), eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), snuffbox (*Epioblasma triquetra*), pink mucket (*Lampsilis abrupta*), scaleshell (*Leptodea leptodon*), sheepnose (*Plethobasus cryphyus*), spectaclecase (*Margaritifera monodonta*), and federal-listed threatened decurrent false aster (*Boltonia decurrens*). The U.S. Fish and Wildlife Service enforces the Endangered Species Act, and we recommend seeking concurrence with their Ecological Services Field Office at 101 Park Deville Drive Suite A, Columbia, Missouri 65203; 573-234-2132 Ext. 100.

COMMISSION

EDWARD C. CLAUSEN, Centertown
MARGARET F. ECKELKAMP, Washington
FRANK H.B. KRUSE, Smithville
RAYMOND T. WAGNER JR., Town and Country

The occurrence of these federal-listed species in addition to multiple unlisted species of conservation concern (SOCCs) listed in the report are due to the project and its surrounding landscape being adjacent to the Meramec River and within the Lower Meramec/Missouri Priority Forested Landscape. Priority Forested Landscapes as detailed in the Department's Comprehensive Conservation Strategy are large landscapes that offer Missouri's best opportunities for improving and sustaining forest resources and the benefits and services derived from them while being under significant but mitigable threat. The bottomland forests within this landscape provide buffer zones along the Meramec which mitigate the effects of erosion, flooding, and sedimentation. Maintaining a forested riparian corridor while implementing measures to prevent or avoid activities that alter or destabilize stream bottoms or banks, or introduce sediment, chemical, or organic pollutants can further protect these sensitive aquatic species in the vicinity of the project.

Data centers represent a rapidly expanding sector of Missouri's economy. As with other large-scale industries, their growth may outpace comprehensive understanding of associated environmental impacts. Early and frequent communication ensures that Missouri's ecological and economic interests are both considered. Therefore, the Department requests further opportunities to coordinate with the project to provide detailed technical advice regarding construction and operation of the facility to continue to protect the fish, forest, and wildlife of our state for the enjoyment of its citizens.

Thank you for your coordination with the Department on the proposed data center in Pacific within Franklin County. Any questions about these comments may be directed to Department Policy Coordinator, Jordan Meyer, at 573-522-4115, extension 3197, or at Jordan.Meyer@mdc.mo.gov.

Sincerely,

AARON JEFFRIES
DEPUTY DIRECTOR

cc: John Weber, USFWS

ENCL: Attachment 1 - Natural Heritage Review Initial Level Three Report: Species Listed Under the Endangered Species Act – Litterell_Franklin_Report and Map

Attachment 2 - Natural Heritage Review Report – Litterell_Franklin_Pacific Data Center 18986

Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

Natural Heritage Review Level Three Report: Species Listed Under the Federal Endangered Species Act

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this report is to provide information to federal, state and local agencies, organizations, municipalities, corporations, and consultants regarding sensitive fish, wildlife, plants, natural communities, and habitats to assist in planning, designing, and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: Pacific Data Center Review Request #18986
Project Description: Approximate footprint of proposed data center near Pacific MO in Franklin Co.
Project Type: Residential, Commercial and Governmental Building Development
Project Size (acres): 556.60
Contact Person: Jordan Meyer
Contact Information: Jordan.Meyer@mdc.mo.gov or 573-522-4115 x3182
Counties: Franklin
Township/Range/Sections: T43NR02ES24; T43NR02ES25; T43NR02ES26; T43NR02ES35; T43NR02ES36

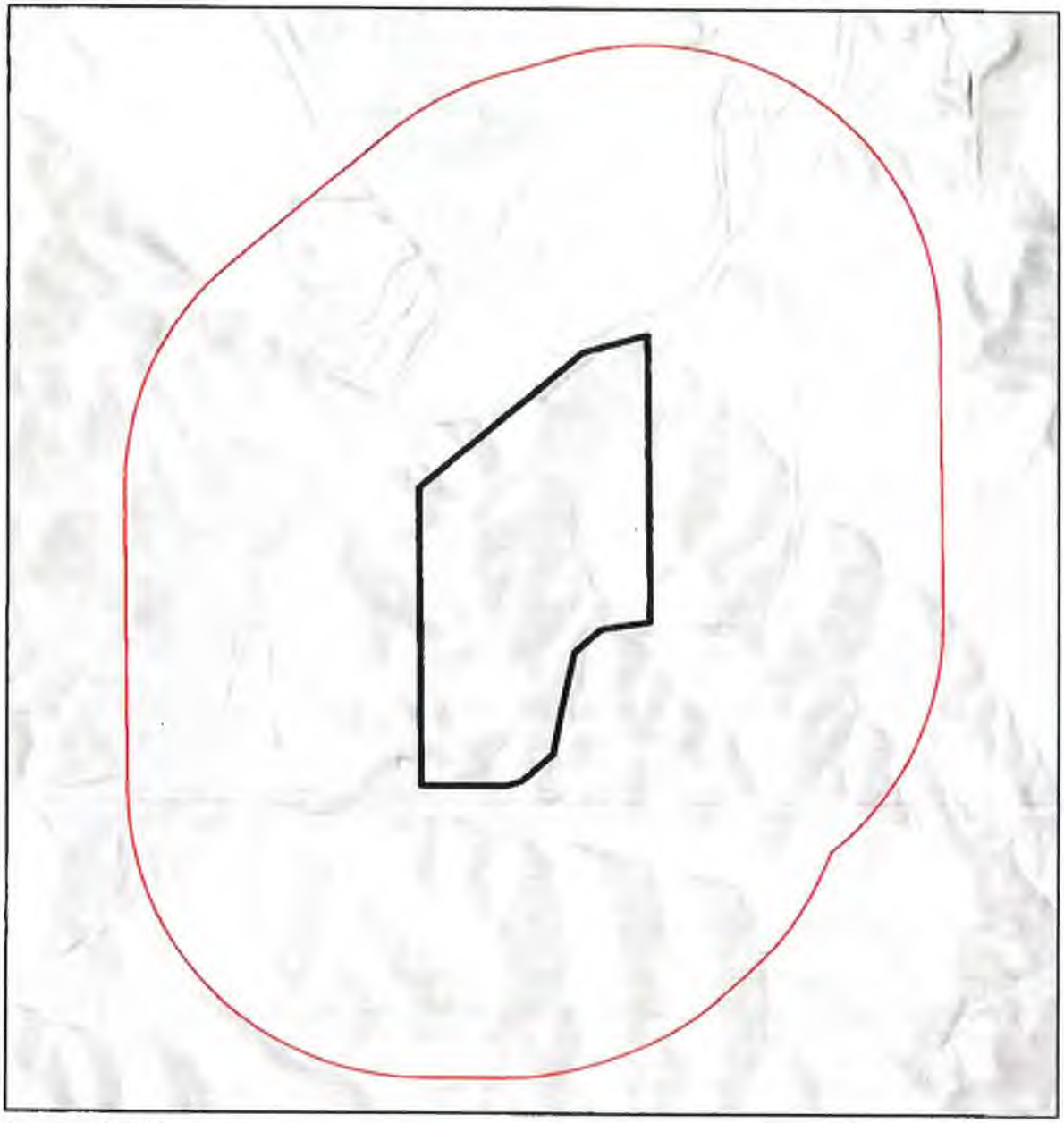
Disclaimer: This NATURAL HERITAGE REVIEW REPORT identifies if a species or natural community tracked by the Natural Heritage Program is known to occur within or near the project area submitted, and shares recommendations to avoid or minimize project impacts to sensitive species or natural habitats. Incorporating information from the Natural Heritage Program into project plans is an important step in reducing impacts to Missouri's sensitive natural resources. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information.

This Natural Heritage Review Report is not a site clearance letter for the project. Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If project plans or location change, this report may no longer be valid. Because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, reports include information about records near but not necessarily on the project site. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. This report does not fulfill Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit IPaC: Home (fws.gov) to initiate USFWS Information for Planning and Conservation (IPaC) consultation. Contact the Columbia Missouri Ecological Field Services Office (573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203) for more information.

Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit Home Page | Missouri Department of Transportation (modot.org) for additional information on recommendations.

Pacific Data Center Review Request



February 10, 2026

1:30,116

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

Buffered Project Boundary

Project Boundary

Sources: Esri, Vantor, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community

Species or Communities of Conservation Concern within the Area:

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Other Special Search Results:

The project occurs on or near public land, Catawissa CA, please contact MDC.

Project Type Recommendations:

New construction, maintenance and remodeling, including government, commercial and residential buildings and other structures. Fish, forest, and wildlife impacts can be avoided by siting projects in locations that have already been disturbed or previously developed, where and when feasible, and by avoiding alteration of areas providing existing habitat, such as wetlands, streams, forest, native grassland, etc. The project should be managed to minimize erosion and sedimentation/runoff to nearby wetlands, streams and lakes, including adherence to any Clean Water Act permit conditions. Project design should include stormwater management elements that assure storm discharge rates to streams for heavy rain events will not increase from present levels. Revegetate areas in which the natural cover is disturbed to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and sericea lespedeza. Pollutants, including sediment, can have significant impacts far downstream. Use silt fences and/or vegetative filter strips to buffer streams and drainages, and monitor the site after rain events and until a well-rooted ground cover is reestablished. Please see Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - If this project has the potential to alter habitat (e.g. tree removal, projects in karst habitat) or cause direct mortality of bats, please coordinate directly with U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 Ext. 100 for Ecological Services) for further coordination under the Endangered Species Act. Indiana bats *(Myotis sodalis*, federal- and state-listed endangered) and **Northern long-eared bats** (*Myotis septentrionalis,* federal-listed endangered) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April.

The project site submitted and evaluated is on or near Sensitive Aquatic Species Waters Meramec River, an important stream for freshwater mussel and amphibian populations. These streams were so designated because they have highly diverse mussel communities and mussel and amphibian species identified as Species of Conservation Concern. These streams are important to maintaining, restoring, or avoiding future listing of Species of Conservation Concern. Impacts to these aquatic species and habitats can be reduced by avoiding or minimizing activities that disturb the stream substrate, including rock placement, dredging, trenching, and wetted gravel bar disturbance; and avoid introducing heavy sediment loads, chemical or organic pollutants. These streams also are included as a Missouri Nationwide Permit Regional Condition (Number 7) that must be considered if working under if working under a Clean Water Act Section 404 Permit issued by the U.S. Army Corps of Engineers (http://www.nwk.usace.army.mil/Missions/RegulatoryBranch/NationWidePermit...). A list of all streams designated under this Condition is available at http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/nationwidepermi....

Karst: This county has known karst geologic features (e.g., caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in Natural Heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are Species of Conservation Concern) are influenced by changes to water quality; please check your project site for any karst features and make every effort to protect groundwater in the project area. Additional information and specific recommendations are available at Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov).

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See Managing Invasive Species in Your Community | Missouri Department of Conservation (mo.gov) for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (Kansas City District Regulatory Branch (army.mil)) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (Section 401 Water Quality Certification | Missouri Department of Natural Resources (mo.gov)), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit Wastewater Permits | Missouri Department of Natural Resources (mo.gov) for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See Missouri Species and Communities of Conservation Concern Checklist (mo.gov) for a complete list of species and communities of conservation concern, and visit mdc.mo.gov/your-property/responsible-construction/species-impact-best-practices for all species-specific Best Management Practices. Detailed information about the animals and some plants mentioned may be accessed at Missouri Fish and Wildlife Information System (MOFWIS) and MDC Field Guides . Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

PRELIMINARY
DEVELOPMENT
PLAN 6.0
VICINITY MAP
NO SCALE
PLANNED UNIT DEVELOPMENT
MCLAREN PROPERTIES
PACIFIC, MISSOURI
2 OF 2

Missouri Department of Conservation

Natural Heritage Review Report

February 17, 2026

Science Branch
P. O. Box 180
Jefferson City, MO 65102
Prepared by: Zack Freeman
NaturalHeritageReview@mdc.mo.gov
(573) 522 – 4115 ext. 3182

Lee Litterell
City of Pacific, MO
llitterell@pacificmo.gov

NHR ERT ID:	18986 **Automated Report Level:** 3
Project type:	Residential, Commercial and Governmental Building Development
Location/Scope:	T43NR02ES24; T43NR02ES25; T43NR02ES26; T43NR02ES35; T43NR02ES36
County:	Franklin
Project Title:	Pacific Data Center
Query received:	2/10/2026

This report is not a site clearance letter. **Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If the project plans or location changes, this report may no longer be valid.** Because land use conditions change and organisms move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, reports include information about records near but not necessarily on the project site. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. These records serve as one reference and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Additional resources about the biological and habitat needs of species to avoid or minimize impacts can be found at the bottom of this report.

Level 3: Records of federal-listed (also state-listed) species or critical habitats near the project site:

Natural Heritage records identify the following federal-designed critical habitats or federal-listed species that are potentially impacted by the proposed project:

- **Indiana Bats, Northern Long-eared Bats, and Tri-colored Bats** occur in Franklin County and could occur in the project area. These species have been significantly impacted by White-nose syndrome. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor these species, especially from September to April. **If any trees need to be removed by your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 Ext. 100) for further coordination under the Endangered Species Act.**
  - Indiana Bats *(Myotis sodalis*, federal and state-listed endangered) and Northern Long-eared Bats (*Myotis septentrionalis,* federal-listed endangered) hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in riparian forests and upland forests near perennial streams.
  - Tri-colored bats (*Perimyotis subflavus*, federally proposed endangered) hibernate in winter in the most humid and warm parts of caves and mines. In summer, they roost in trees, bridges, culverts, in crannies about cliffs or buildings, in barns, or sometimes in high domes of caves.

This project is adjacent to the Meramec River, which has suitable habitat for Eastern Hellbenders.

- **Eastern Hellbender:** The proposed project occurs near a stream known to include or to provide habitat suitable for Eastern Hellbenders (*Cryptobranchus alleganiensis alleganiensis,* federally and state-listed endangered). Hellbenders are strictly aquatic salamanders whose well-being is dependent on high-quality water systems with constant levels of dissolved oxygen, temperature, and flow. These unusual animals are in serious decline. Activities that change physical characteristics of rivers and streams (especially introducing silt loads or destabilizing gravel bars)

or alter the flow of water should be avoided. Please see Best Management Practices for Construction and Development Projects Ozark Hellbender and Eastern Hellbender (mo.gov).

- **Meramec River:** The Meramec River is home to many mussel and crayfish species of conservation concern. Freshwater mussels are important indicators of water quality and stream degradation, with many in serious decline. These species must be assumed to be present in appropriate habitats in this part of the Meramec River and its tributaries. Every effort should be made to avoid introducing pollution, sediment, or higher volumes of stormwater runoff from the project site, both during construction and after development. Please see Best Management Practices for Construction and Development Projects Freshwater Mussels (mo.gov).

Meramec River Species of Concern	Common Name	Federal Status	State Status	State Rank
Epioblasma triquetra	Snuffbox	E	E	S1
Lampsilis abrupta	Pink Mucket	E	E	S2
Leptodea leptodon	Scaleshell	E	E	S1
Plethobasus cyphyus	Sheepnose	E	E	S2
Margaritifera monodonta	Spectaclecase	E	E	S3
Crystallaria asprella	Crystal Darter		E	S1
Elliptio crassidens	Elephantear		E	S1
Reginaia ebenus	Ebonyshell		E	S1
Simpsonaias ambigua	Salamander Mussel		E	S1

Besides the endangered species above, the Large Seeded Mercury, Elktoe, Rock Pocketbook, Black Sandshell, Hickorynut, and Wartyback are tracked in this river system. Also tracked are Alabama Shad, Blue Sucker, Ghost Shiner, River Darter, and Belted Crayfish.

There are records of Decurrent False Aster within 3 miles of the project area.

- **Decurrent False Aster:** Decurrent False Aster (*Boltonia decurrens*, federal-listed threatened and state-listed endangered) may occur in this area. Decurrent False Aster is a head floodplain species that grows in wetlands and on the borders of marshes, lakes, oxbows, and sloughs. It also may be found in old fields, roadsides, agricultural fields, and on levees. It favors sites characterized by moist soil and regular disturbance, preferably periodic flooding, which maintains open areas with high light levels. Today it is found in areas where succession is prevented, and sunlight is allowed to reach the seedlings. It is a perennial plant that blooms from August through October. Please see Best Management Practices for Construction and Development Projects Decurrent False Aster (mo.gov).

FEDERAL-LISTED species/habitats are protected under the Federal Endangered Species Act. Contact U.S. Fish & Wildlife Service (101 Park Deville Drive Suite A, Columbia, Missouri 65203; 573-234-2132 Ext. 100) for Endangered Species Act coordination and concurrence information.

Level 2: Records of state-listed (not federal-listed) endangered species AND / OR state-ranked (not state-listed endangered) species and natural communities of conservation concern. The Department tracks these species and natural communities due to population declines and/or apparent vulnerability.

Natural Heritage records identify the following state-listed and/or state-ranked species that are potentially impacted by the proposed project:

There are records of Crystal Darters within 1 mile of the project area.

- **Crystal Darter:** Crystal Darter (*Crystallaria asperella,* State-listed Endangered) have a large historic range, stretching from river basins in West Virginia west to Missouri and Minnesota south to the Gulf of Mexico. In east-central to southeastern Missouri, they inhabit open channels of large, clear streams with low to moderate gradients and long stretches of silt-free sand and small gravel substrate. Please see Best Management Practices for Construction and Development Projects Crystal Darter (mo.gov).

There are records of Bald Eagles within 1 mile of the project area.

- **Bald Eagles:** Bald Eagles (*Haliaeetus leucocephalus*) nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: Do I need an eagle take permit? | U.S. Fish & Wildlife Service (fws.gov) if eagle nests are seen.

  Following USFWS Incidental Take Guidelines: To avoid the incidental take of bald eagles we recommend:
  - a buffer of at least 660 feet between project activities and the nests (including active and inactive nests).
  - If project activities are within 660 feet of the nest, please restrict activities to outside the nesting season. The nesting season in Missouri is January 1 – July 15.
  - If these recommendations cannot be implemented, incidental take of bald eagles may occur and a permit from USFWS may be necessary.
  - Do not clear nests or nest trees.

Scientific Name	Common Name	State Rank	Proximity (miles)	Primary Habitat
Aralia nudicaulis	Wild Sarsaparilla	S2	<3	Bluff
Asplenium trichomanes ssp. trichomanes	Maidenhair Spleenwort	SU	<4	Bluff
Dibaeis absoluta	A Lichen	S1	<3	Bluff
Huperzia porophila	Fir Clubmoss	S2	<3	Bluff
Sullivantia sullivantii	Sullivantia	S2	<3	Bluff
Pseudotaxiphyllum distichaceum	A Moss	S1	<3	Bluff, Forest upland
Nardia lescurii	A Liverwort	S1	<3	Bluff, Forest matrix
Eurybia furcata	Forked Aster	S2	<4	Bluff, Fen/seep, Moist edge/mudflat
Mnium thomsonii	A Moss	S?	<5	Talus, Forest matrix
Setophaga cerulea	Cerulean Warbler	S2S3	<4	Forest bottomland, Forest upland
Chelone obliqua	Rose Turtlehead	S2	<3	Forest bottomland, Wetland matrix
Lycopodium dendroideum	Round-branched Ground Pine	S1	<3	Forest upland, Bluff
Tipularia discolor	Cranefly Orchid	S3	<5	Forest upland, Woodland
Lithobates sylvaticus	Wood Frog	S3	<3	Forest upland, Ephemeral pools, Wetland matrix, Talus

Hemidactylium scutatum	Four-toed Salamander	S4	<3	Forest upland, Fen/seep, Sinkhole pond
Physalis missouriensis	Missouri Groundcherry	S1	<3	Forest upland, Moist edge/mudflat, Glade complex, Roadside/railroad, Waste areas
Lactuca hirsuta	Hairy Lettuce	S3	<3	Forest matrix, Woodland, Sinkhole pond
Liatris scariosa var. nieuwlandii	A Blazing Star	S2	<3	Grassland native prairie, Savanna/Shrub/Woodland matrix, Glade complex
Anthoceros agrestis	A Hornwort	S2	<4	Grassland matrix
Cyperus schweinitzii	Schweinitz's Flatsedge	S3	<1	Grassland matrix, Moist edge/mudflat, Roadside/railroad
Alasmidonta marginata	Elktoe	S2	<1	River/stream
Alosa alabamae	Alabama Shad	S2	<1	River/stream
Ammocrypta clara	Western Sand Darter	S2S3	<3	River/stream
Arcidens confragosus	Rock Pocketbook	S3	<1	River/stream
Cambarus maculatus	Freckled Crayfish	S3	<4	River/stream
Carpiodes velifer	Highfin Carpsucker	S2	<2	River/stream
Faxonius harrisonii	Belted Crayfish	S3	<4	River/stream
Ligumia recta	Black Sandshell	S2	<1	River/stream
Obovaria olivaria	Hickorynut	S3	<3	River/stream
Percina shumardi	River Darter	S3	<3	River/stream
Utterbackiana suborbiculata	Flat Floater	S2	<1	River/stream, Pond/lake/deep oxbows & slough
Rorippa aquatica	Lake Cress	S2	<4	Aquatic matrix, Moist edge/mudflat
Formica querquetulana	Oak-grove Ant	S1	<3	Old field/shrub
Celastrina nigra	Dusky Azure	S2S3	<4	Woodland

State Rank Definitions:

- **S1:** Critically imperiled in the state because of extreme rarity of or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically, 5 or fewer occurrences or very few remaining individuals (<1,000).
- **S2:** Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state (6 to 20 occurrences or few remaining individuals).
- **S3:** Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically, 21 to 100 occurrences or between 3,000 and 10,000 individuals.
- **S4:** Uncommon but not rare, and usually widespread in the nation or state. Possible cause of long-term concern. Typically, more than 100 occurrences and more than 10,000 individuals.
- **S#S#:** Range Rank: A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status.
- **S?:** Denotes inexact or uncertain numeric rank.
- **SU:** Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

There are no regulatory requirements associated with state ranks, however we encourage voluntary stewardship to minimize the risk of further decline that could lead to state or federal listing.

STATE ENDANGERED species are protected under the Wildlife Code of Missouri (3CSR10-4.111). See the Missouri Species And Communities Of Conservation Concern Checklist for a complete list of species examined for this report.

General recommendations related to this project or site, or based on information about the historic range of species (unrelated to any specific Natural Heritage records):

- **Land Development:** Construction should be managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any Clean Water Act permit conditions (Missouri DNR or US Army Corps of Engineers). Project design should include stormwater management elements that assure storm discharge rates to streams for heavy rain events will not increase from present levels. Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza. Please see Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).

- **Transportation:** Transportation related projects typically change the plants and animals that live on the right-of-way or in the vicinity. Minimize erosion and sedimentation/runoff to nearby streams and lakes by carefully adhering to any Clean Water Act permit conditions (Missouri DNR or US Army Corps of Engineers); and include design elements to manage stormwater so that present water discharge rates from the site to streams during heavy rain events are not increased. Revegetation of disturbed areas is recommended to minimize erosion, as is restoration with native plant species compatible with the local landscape and wildlife needs. Annuals like ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza.

- **Karst:** Franklin County has known karst geologic features (e.g. caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in Natural Heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are species of conservation concern) are influenced by changes to water quality, so check your project site for any karst features and make every effort to protect groundwater in the project area. Please see Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov).

- **Invasive exotic species:** These species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, larvae, and aquatic plant material may be moved on boats or construction equipment, so inspect and clean equipment thoroughly before moving between project sites.
  - Remove any mud, soil, trash, plants (or plant material) or animals from equipment before leaving any water body or work area.
  - Drain water from boats and machinery that has operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
  - When possible, wash and rinse equipment thoroughly with hard spray or HOT water (≥140° F, typically available at do-it-yourself carwash sites), and dry in the hot sun before using again.
  - Avoid planting invasive species including crown vetch and sericea lespedeza.

Additional information about the biological and habitat needs of species or elements to avoid or minimize impacts:

- Best Management Practices (BMPs) for species, karst, and streams, and information about the Missouri Natural Heritage Program: https://mdc.mo.gov/your-property/responsible-construction

- MDC Field Guides for species: https://mdc.mo.gov/discover-nature/field-guide
- MDC Terrestrial Natural Communities: https://mdc.mo.gov/discover-nature/habitats/statewide-habitat-systems/terrestrial-natural-communities
- Missouri Fish and Wildlife Information System (MOFWIS): https://mdc12.mdc.mo.gov/Applications/Mofwis

These recommendations are ones project managers might prudently consider based on a general understanding of species' needs and landscape conditions. Natural Heritage records largely reflect sites visited by specialists in the last 35 years. Many privately owned tracts have not been surveyed and could host remnants of species once but no longer common.