



United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
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Standing Analysis – Illinois and Iowa

Determination Key

Version 1.1

Prepared by

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
CH	Critical Habitat
CM	Conservation Measure
CR	Conservation Recommendation
DBH	Diameter-at-Breast-Height
DKey	Determination Key
ECOS	Environmental Conservation Online System
ESA	Endangered Species Act of 1973
ESFO	Ecological Services Field Office
FHWA	Federal Highway Administration
FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transportation Administration
IPaC	Information for Planning and Consultation
NE	“No effect” determination
NLAA	“May affect, not likely to adversely affect” determination
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NWR	National Wildlife Refuge
MA	“May affect” determination
SSA	Species Status Assessment
USFWS	U.S. Fish and Wildlife Service

1 Introduction

1.1 Purpose of the Standing Analysis

This standing analysis provides an optional, streamlined alternative consultation process for federal action agencies and designated non-federal representatives, to address potential effects of future actions, pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), to the species and critical habitats listed in Section 1.6 of this standing analysis. The U.S. Fish and Wildlife Service (Service) developed this standing analysis to streamline the process of reviewing actions that would result in a “may affect, not likely to adversely affect” (NLAA) determination for the subject species and critical habitat(s). This standing analysis also provides proactive technical assistance for actions that would result in a “no effect” (NE) determination.

This standing analysis provides an optional consultation process that is available to federal agencies for federal actions that meet the criteria described below as delivered through a Determination Key (DKey) in the Service’s Information for Planning and Consultation (IPaC) application. To obtain consultation documents, including technical assistance for NE and concurrence with NLAA determinations, federal action agencies and designated non-federal representatives may use the associated DKey in IPaC to answer questions about the proposed action. By screening the project through the DKey, all or part of the standing analysis is adopted by the federal action agency and used to either fulfill the consultation requirement or indicate that further coordination with the Service is required. It also provides technical information to help determine whether an action will have no effect on the species or critical habitat. Actions which an action agency determines will have no effect on species or critical habitat do not require submittal to the Service. With the IPaC DKey established for this standing analysis, the action agency may receive a letter of concurrence or a technical assistance letter for eligible projects by providing specific information requested in the DKey.

This standing analysis also provides an optional evaluation process that is available to non-federal project proponents for actions that meet the criteria described below as delivered through a Determination Key (DKey) in the Service’s Information for Planning and Consultation (IPaC) application. With the IPaC DKey established for this standing analysis, non-federal project proponents may receive a technical assistance letter for eligible projects by providing specific information requested in the DKey. Throughout the remainder of this document, statements regarding this standing analysis refer to both the standing analysis and the associated DKey.

1.2 Benefits of the Standing Analysis

For those federal actions that the Service has accumulated significant knowledge in analyzing previously, the Service is able to develop a standing analysis to streamline the consultation process for eligible federal actions. The streamlined process facilitated by this standing analysis will reduce the amount of Service staff time necessary to review actions requesting consultation and provide federal agencies, consultants, and other project proponents a predictable, consistent, and timely response for qualified actions. In addition, development of a standing analysis to

assess the impacts of individual projects allows the Service to track multiple independent actions on listed species and critical habitats more efficiently.

1.3 Eligibility for Use of the Standing Analysis

A standing analysis itself does not convey concurrence with NLAA determinations for individual projects. The standing analysis allows the Service to quickly evaluate an action agency's analysis of effects to listed species and critical habitat. If the action agency's proposed action is consistent with 'covered area and covered activities, including any required conservation measures in the standing analysis, the Service will concur that the action will have insignificant, discountable, or completely beneficial effects on the relevant listed species and critical habitat (i.e., NLAA).

The standing analysis may also provide technical information to help agencies identify actions that will have no effect on the listed species and critical habitat. For projects that do not qualify to use the standing analysis, action agencies/project proponents should coordinate directly with the Illinois-Iowa Ecological Services Field Office (ESFO) to address any consultation requirements, as appropriate.

1.4 Ensuring Accurate Determinations

As is true in all consultation procedures, the Service relies on complete and accurate information provided by federal action agencies during consultation. To apply this standing analysis to a project, it is the responsibility of the action agency/project proponent to provide information that is truthful and accurate and that fully represents the entire scope of the project to comply with the ESA.

Where appropriate in our analysis, we make note of which activities are expected to have no effects on a species or critical habitat, and which activities may affect species or critical habitat. This information is provided as technical assistance to action agencies making no effect/may affect determinations.

1.5 Updates to the Standing Analysis

This standing analysis will be reviewed annually and updated as needed to ensure the analysis contains the best scientific and commercial data available. This update process will include regular reviews to ensure that the analysis is accurate and valid, and that the standing analysis still meets the Act's requirements. All updates will also ensure that the logic is sound and that determinations are appropriate for covered activities. Updates will be signed under an updated cover.

¹The term "covered" is used throughout this document to define the limits of use of a standing analysis. However, although the area, activities, and species are "covered" by the standing analysis, the future activities themselves are not "covered" by the standing analysis; there are additional steps (with or without a DKey) that take place for an action agency to utilize the information in the standing analysis and to request concurrence that their proposed action is NLAA for listed species and Critical Habitat.

Projects reviewed under this standing analysis must rely on the version that is current on the date consultation is completed. For reference, both current and previous versions of the standing analysis will be maintained by the lead field office. Our Illinois/Iowa DKey library, including our standing analysis and any updated versions, will be located here: [Illinois-Iowa Determination Key \(DKey\) | U.S. Fish & Wildlife Service](#). If we revise the standing analysis and determine reinitiation is required for any ongoing activities that used the previous standing analysis, the Services will contact the respective action agency and advise them of their need to reinitiate.

1.6 Covered Species & Critical Habitats

In general, the Illinois-Iowa DKey and Standing analysis covers most federally listed and proposed species and designated and proposed designated critical habitat within Illinois and Iowa. However, the key and standing analysis does not cover the northern long-eared bat (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), rusty patched bumble bee (*Bombus affinis*) and rusty patched bumble bee critical habitat because a range-wide DKey and supporting standing analysis was developed for each of these species and/or critical habitat. Although the Illinois-Iowa DKey and the standing analysis will be updated periodically, the key may also not cover species recently proposed for listing or critical habitat recently proposed for designation.

Mammals

- Gray Bat (*Myotis grisescens*) – Endangered
- Indiana Bat (*Myotis sodalis*) - Endangered

Birds

- Piping Plover (*Charadrius melodus*) – Threatened, Endangered
- Rufa Red Knot (*Calidris canutus rufa*) - Threatened
- Whooping Crane (*Grus americana*) – Experimental Population, Non-Essential

Reptiles

- Alligator Snapping Turtle (*Macrochelys temminckii*) – Proposed Threatened
- Eastern Massasauga Rattlesnake (*Sistrurus catenatus*) - Threatened

Fishes

- Pallid Sturgeon (*Scaphirhynchus albus*) – Endangered
- Topeka Shiner (*Notropis topeka*) - Endangered

Clams-Freshwater Mussels

- Clubshell (*Pleurobema clava*) - Endangered
- Fanshell (*Cyprogenia stegaria*) - Endangered
- Fat Pocketbook (*Potamilus capax*) – Endangered
- Higgins Eye (*Lampsilis higginsii*) - Endangered
- Longsolid (*Fusconaia subrotunda*) - Threatened
- Northern Riffleshell (*Epioblasma torulosa rangiana*) – Endangered
- Orangefoot Pimpleback (*Plethobasus cooperianus*) - Endangered

- Pink Mucket (*Lampsilis abrupta*) - Endangered
- Rabbitsfoot (*Quadrula cylindrica cylindrica*) – Threatened
- Ring Pink (*Obovaria retusa*) – Endangered
- Rough Pigtoe (*Pleurobema plenum*) - Endangered
- Salamander Mussel (*Simpsonaias ambigua*) – Proposed Endangered
- Sheepnose (*Plethobasus cyphus*) - Endangered
- Snuffbox (*Epioblasma triquetra*) – Endangered
- Spectaclecase (*Cumberlandia monodonta*) - Endangered

Snails

- Iowa Pleistocene Snail (*Discus macclintocki*) - Endangered

Insects

- Hine’s Emerald Dragonfly (*Somatochlora hineana*) – Endangered
- Monarch Butterfly (*Danaus plexippus*) – Proposed Threatened

Crustaceans

- Illinois Cave Amphipod (*Gammarus acherondytes*) - Endangered

Plants

- Decurrent False Aster (*Boltonia decurrens*) - Threatened
- Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) – Threatened
- Lakeside Daisy (*Hymenoxys herbacea*) – Threatened
- Leafy Prairie-clover (*Dalea foliosa*) - Endangered
- Mead’s Milkweed (*Asclepias meadii*) – Threatened
- Northern Wild Monkshood (*Aconitum noveboracense*) - Threatened
- Pitcher’s Thistle (*Cirsium pitcheri*) – Threatened
- Prairie Bush-clover (*Lespedeza leptostachya*) – Threatened
- Price’s Potato-bean (*Apios priceana*) - Threatened
- Short’s Bladderpod (*Physaria globosa*) – Endangered
- Western Prairie Fringed Orchid (*Platanthera praeclara*) - Threatened

Critical Habitats (CH)

- Hine’s Emerald Dragonfly CH
- Indiana Bat CH
- Piping Plover CH
- Poweshiek Skipperling CH
- Rabbitsfoot CH
- Sheepnose Mussel CH
- Snuffbox Mussel CH
- Spectaclecase Mussel CH
- Topeka Shiner CH

2 Covered Area

This standing analysis applies within the entire states of Illinois and Iowa, unless otherwise excluded (Section 3.1). In delineating the geographic scope of this standing analysis (covered area), we determined the appropriate extent based on the species and critical habitats included and the activities covered herein. To qualify to use this standing analysis, a project's action area must fall completely within the covered area and not extend into any other states. Specific action areas will be determined on a project-by-project basis.



Figure 2.0. Map displaying the covered area (blue) for the determination key for the states of Illinois and Iowa.

3 Covered Activity Description

The activities described herein include all activities addressed in this standing analysis. The activity description, conservation measures, and covered area inform the standing analysis and describe which specific activities are appropriate for NE or NLAA outcomes under this analysis. The description of activities and their inclusion in the standing analysis should not be construed to indicate that these activities will always result in effects to the species or its critical habitat, nor is it meant to cover activities that fall outside of the analysis as described below. Action agencies are not required to use this standing analysis; they continue to have the option to request individual consultation on a project; however, in most cases, we anticipate use of the standing analysis will substantially decrease consultation timeframes.

The proposed action is the compilation of many different types of projects that, depending on their size, specific location, and timing, often do not significantly affect any federally listed threatened or endangered species or critical habitats in Illinois and Iowa. Common project types include, but are not limited to, the following:

- Vegetation management (e.g. mowing, tree cutting/trimming, herbicide application, prescribed burning)
- Forestry activities (e.g. timber harvest, stand improvement, invasive plant treatment)
- Commercial, residential, and recreational developments
- Construction, maintenance, operation, modification, and/or removal of:
 - o Roads/trails/railroads
 - o Communication towers
 - o Transmission and utility lines
 - o Oil, gas, CO² pipelines and wells
 - o Water and sewer pipelines
 - o Bridges and culverts
 - o Water treatment plants
 - o Hydroelectric facilities/locks and dams
 - o Canals/levees/dikes/wing dams
 - o Stream crossings/dams including low head
 - o Boat ramps/docks/marinas
- Habitat restoration or enhancement
- Shoreline protection/beach or shoreline nourishment/dredge disposal (in water or upland)
- Dredging and filling of wetlands or waterbodies
- Stream/waterbody modification, including water withdrawal and discharge
- Military operations
- Agricultural activities

For additional details on these actions and their component sub activities, a deconstruction table can be found in Appendix A.

3.1 Limits

To assist action agencies/project proponents in determining whether their project meets the requirements of this standing analysis, the Service will provide a series of questions to assess whether the action is not likely to adversely affect listed species or critical habitat because the impacts are either unable to be meaningfully measured, detected, or evaluated and, therefore, insignificant; or extremely unlikely to occur and, therefore, discountable. Any actions that may adversely affect a listed species or critical habitat do not qualify under this standing analysis and require separate individual project review and consultation by the IL-IA ESFO.

Actions that include certain activities, occur in certain geographic areas, or meet one or more context-dependent conditions will not be eligible to use the standing analysis. For projects requiring consultation (i.e., that “may affect” listed species or critical habitats) that do not qualify due to one or more of these exclusions, action agencies/project proponents must contact the IL-IA ESFO directly to complete their consultation requirements.

3.1.1 Activity Based Limits/Sideboards

To receive the Service’s technical assistance acknowledgement of an action agency’s NE determination or the Service’s concurrence for an NLAA determination, based on this standing analysis, actions and activities may not include the following:

1. Purposeful take of a listed species (e.g. research, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species)
 - a. Take is prohibited under Section 9 of the ESA. If purposeful take is anticipated, then formal consultation with the Service may be required to issue an incidental take or recovery permit.
2. Long-term (i.e., greater than 10 years) permits, plans, or other actions (e.g., Federal Energy Regulatory Commission licenses)
 - a. These activities are likely to change over time, result in impacts to species that are not currently foreseeable, and/or have impacts to species that are not currently listed or included in this DKey. Thus, they are outside the scope of this standing analysis.
3. Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transportation Administration (FTA) transportation projects
 - a. FHWA, FRA, or FTA should not use this standing analysis for actions that may affect the endangered Indiana bat, endangered northern long-eared bat, and proposed endangered tricolored bat. The FHWA, FRA, FTA Programmatic Consultation for Transportation Projects is intended for projects funded or authorized by FHWA, FRA, or FTA, that may affect the endangered Indiana bat, endangered northern long-eared bat, and proposed endangered tricolored bat. A separate DKey and standing analysis is available for use.
4. Leasing, construction or operation of wind turbines
 - a. This activity can have significant impacts on listed bat species and migratory birds and thus is outside the scope of this standing analysis.
5. Construction of a communication tower that:

- a. Uses guy wires,
 - b. Has improper lighting
 - i. Does not use flashing only LED lights at the minimum configuration allowed by the FAA (i.e. no pulsing or steady-burning lights)
 - ii. Does not utilize motion- or heat-sensitive, down-shielded, and minimum intensity security lighting on all on-ground facilities, equipment, and infrastructure to reduce nighttime bird attraction)
 - c. Is over 450 feet in height, or
 - d. Is located near (within 3-miles) a bird concentration area (e.g., state wildlife/waterfowl areas and parks, National Wildlife Refuges and waterfowl management areas, National Forests or Parks, Great Lakes coastlines, Audubon Society "Important Bird Area," rookeries, etc.)
 - e. These activities can have significant impacts on migratory birds and thus is outside the scope of this standing analysis.
6. Construction of new transmission or overhead utility line(s) and/or re-alignment or re-configuration of an existing line (e.g. increased height).
 - a. This activity can have significant impacts on migratory birds and thus is outside the scope of this standing analysis.
 7. Aerial or other broad application of chemicals including herbicides and/or pesticides (i.e. non-targeted application).
 - a. This activity can have significant impacts to listed species, their habitats, and/or their other necessary resources (e.g., food) and thus is outside the scope of this standing analysis.
 8. New point source discharge from a facility or water intake to a facility that does not have an NPDES permit.
 - a. This activity can have significant impacts to listed species, their habitats, and/or their other necessary resources (e.g., food) and thus is outside the scope of this standing analysis.
 9. Creation of a new water-borne contaminant source (e.g., leachate pond, or pits containing chemicals)
 - a. This activity can have significant impacts to listed species, their habitats, and/or their other necessary resources (e.g., food) and thus is outside the scope of this standing analysis.

To ensure compliance with the ESA, project-specific consultation (or other programmatic consultation, if applicable) with the Service may be necessary for projects including one or more of the actions listed above. Those projects would not necessarily result in significant adverse effects to listed species or habitats but rather warrant individual review and consideration of project-specific conservation measures.

3.1.2 Location Based Limits/Sideboards

As outlined in the Covered Area section (2.0), this standing analysis will apply broadly where the species and critical habitat listed in section (1.6) may be present within the states of Illinois and Iowa, unless otherwise excluded.

- Indiana Bat/Gray Bat - All activities within a primary buffer of an Indiana bat hibernacula, Indiana bat Critical Habitat location, and/or gray bat maternity colony or hibernacula will be excluded.
- Whooping Crane - For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge (NWR and National Park (NP) land (require consultation under 7(a)(2) of the ESA) and as proposed species on other lands.

3.1.3 Conditional/Other Limits/Sideboards

In addition, the following conditional limits/sideboards are addressed below in the Conservation Measures section

- N/A

3.2 Conservation Measures (CM)

This standing analysis applies conservation measures as design features to avoid adverse effects on an individual, population, or species. The Service has previously found that the incorporation of certain conservation measures voluntarily adopted by action agencies, has reduced effects to the extent that the actions do not require formal consultation and the Service, and the action agency have found that actions are not likely to adversely affect species and critical habitat. Projects using this standing analysis to support a determination of NE or NLAA must meet all the requirements of the standing analysis. The inability to voluntarily adopt certain conservation measures may result in a project not qualifying to use this standing analysis. We have built the following conservation measures into questions in the DKey such that any action that gets a NLAA verification letter or NE consistency letter is not expected to adversely affect the species. Therefore, answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid. Additional conservation recommendations (CR) are also included that may be voluntarily implemented as part of the project to further avoid and minimize project impacts.

3.2.1 Qualifying Questions

3.2.1.1 Birds

Collision/Electrocution

- CM-Birds-1: Communications Towers – Design, lighting, and siting are the most effective avoidance and minimization measures to reduce bird collisions with communication towers.

<https://www.fws.gov/story/avoidance-and-minimization-measures-communication-towers>

<https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation>

- CR-Birds-2: Overhead Transmission and Utility Lines - Design and siting are the most effective avoidance and minimization measures to reduce bird collisions. The Service recommends siting new transmission lines outside of areas considered high risk to birds and designing or retrofitting infrastructure to be “avian-safe” in these areas. Poles can be made avian-safe through design to minimize avian electrocution risk by providing sufficient separation between phases and between phases and grounds or by covering exposed parts with insulators to physically separate electricity from birds. We also recommend burying lines to minimize collision risk.

<https://www.fws.gov/story/avoidance-and-minimization-measures-power-lines>

3.2.1.2 Herbicide/Pesticide/Fertilizer Application (APP)

- CM-APP-1: Avoid aerial or other large-scale application of any chemicals including herbicides, pesticides (e.g. insecticide, fungicide, rodenticide, etc.), and/or fertilizers in areas where potential habitat for a listed species is present.
- CM-APP-2: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of listed species.
- CM-APP-3: Utilize targeted application methods (hack-and-squirt, basal bark, injections, cut-stump, or spot-spraying) and avoid application of pesticides in suitable habitat or listed species or in a manner that may result in transport or drift of pesticides into areas that are suitable habitat for listed species.

3.2.1.3 Clean Water (CW)

- CM-CW-1: Implement measures to avoid pollution/contamination of rivers/streams and other habitats occupied by listed species and avoid creation of new water-borne contaminant sources (e.g. leachate pond, or pits containing chemicals).
- CM-CW-2: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of potential habitats and/or surface water runoff to potential habitat.
- CM-CW-3: Comply with any requirements of an NPDES permit if applicable.

3.2.1.4 Habitat

- CM-Habitat-1: Avoid locating projects in areas where potential habitat (see below) for listed species is present.
 - natural or semi-natural vegetation types (e.g. grassland, scrub-shrub, forest, etc.);
 - waterbodies (rivers, stream, lake, wetland);
 - mines, caves or associated sinkholes, fissures, or other karst features; or
 - buildings, bridges, or culverts that may provide potential habitat to listed species
- CM-Habitat-2: Avoid potential effects to potential habitat of listed species present in the action area.
 - This includes potential effects within the entire action area. Effects on surface water or groundwater, for example, often extend outside of a project’s immediate footprint. The same is true for actions that may cause drift of airborne particles or

chemicals into nearby areas or when noise or artificial light is projected to areas outside of the immediate project footprint where they may act as stressors for some species or critical habitats. Be careful when assessing actions that affect rights-of-way, which often contain natural or semi-natural vegetation despite periodic mowing or other management. Some endangered and threatened species inhabit rights-of-way and could be affected by regular maintenance activities or construction.

- CM-Habitat-3: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (wetland, marshes, fens, etc.) quantity or flow.
- CM-Habitat 4: Avoid in-river, in-stream, or riparian impacts (e.g., construction, road crossings/bridges, dams, wing dikes, pilings, shoreline stabilization, dredging, dredge disposal, etc.).
- CM-Habitat-5: Inspect equipment and materials for invasive species (plants or animals) and/or clean prior to arrival on site.
- CM-Habitat-6: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.

3.2.2 Mammals

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation/fragmentation
 - Exposure Risk/Disturbance

3.2.2.1 Gray Bat (*Myotis grisescens*) - GBAT

Habitat loss/degradation/fragmentation

- CM-GBAT-1: Avoid or minimize impacts to known or potential maternity colony sites and hibernacula (caves or associated sinkholes, fissures, or other karst features).
- CM-GBAT-2: In areas of potential maternity colony sites, conduct a voluntary Phase 1 habitat assessment for potentially suitable hibernacula in accordance with the guidance in the USFWS' current Range-wide Indiana bat and Northern long-eared bat Survey Guidelines.
 - <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>
- CM-GBAT-3: Avoid mineral extraction (e.g. mine/quarry) or drilling/blasting into bedrock within buffers of known maternity colony sites and in areas with suitable habitat for maternity colonies (caves or associated sinkholes, fissures, or other karst features).

Exposure Risk/Disturbance

- CM-GBAT-4: Conduct bridge or culvert assessment(s) according to the range-wide Indiana bat and northern long-eared bat survey guidelines to evaluate bat use.
- CM-GBAT-5: Avoid or minimize impacts to bridges or culverts occupied by gray bats.
- CM-GBAT-6: Conduct prescribed fire under conditions that will reduce or eliminate smoke dispersing into known or potential gray bat maternity colony sites and hibernacula.

- CM-GBAT-7: Complete project activities during the hibernation period for gray bats (October 1-March 31 or November 15-March 31 if within a maternity colony buffer).
- CM-GBAT-8: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential foraging habitat (waterbodies) of the species.

3.2.2.2 Indiana Bat (*Myotis sodalis*) - IBAT

Habitat loss/degradation/fragmentation

- CM-IBAT-1: Avoid or minimize impacts to suitable Indiana bat summer habitat (see definition below) and avoid impacts to known or potential hibernacula (caves or associated sinkholes, fissures, or other karst features and mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats).
 - Suitable summer habitat for Indiana bats includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 5 inches dbh that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of another forested/wooded habitat. Indiana bats have also been observed roosting in human-made structures, such as bridges and bat houses (artificial roost structures); therefore, these structures should also be considered potential summer habitat.
- CM-IBAT-2: In areas of potential hibernacula, conduct a voluntary Phase 1 habitat assessment for potentially suitable hibernacula in accordance with the guidance in the USFWS' current Range-wide Indiana bat and Northern long-eared bat Survey Guidelines.
 - <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>
- CM-IBAT-3: In areas of potential summer habitat, conduct a voluntary Phase 1 habitat assessment in accordance with the guidance the USFWS' current Range-wide Indiana bat and Northern long-eared bat Survey Guidelines.
 - <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>
- CM-IBAT-4: Avoid mineral extraction (e.g. mine/quarry) or drilling/blasting into bedrock in areas of known or potential hibernacula (caves or associated sinkholes, fissures, or other karst features and mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats).
- CM-IBAT-5: Avoid permanent alterations to potential bat roosting spaces (e.g., existing joints, cracks, or crevices) during bridge and culvert maintenance activities.
- CM-IBAT-6: Avoid and minimize the clearing or conversion of suitable Indiana bat summer habitat and limit to less than 10 acres in total extent for each project.
- CM-IBAT-7: Avoid clearing any potential Indiana bat roost trees (i.e., live trees and/or snags ≥ 5 inches diameter at breast height that have exfoliating bark, cracks, crevices, and/or cavities) where practicable.

Exposure Risk/Disturbance

- CM-IBAT-8: Conduct bridge or culvert assessment(s) according to the range-wide Indiana bat and northern long-eared bat survey guidelines to evaluate bat use.
- CM-IBAT-9: Coordinate with local Ecological Services Field Office when the project involves removal, modification, or maintenance of a human-made structure (barn, house, or other building) known or suspected to contain roosting Indiana bats.
- CM-IBAT-10: Conduct voluntary presence/absence bat survey(s) following the Service's Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines to evaluate bat presence/absence within the action area.
- CM-IBAT-11: Conduct prescribed fire under conditions that will reduce or eliminate smoke dispersing into known or potential Indiana bat hibernacula.
- CM-IBAT-12: Complete project activities including tree clearing during the hibernation period for Indiana bats (October 1-March 31 or November 15-March 31 if near a hibernaculum) and avoid conducting any activities during the pup season (May 15-July 31).
- CM-IBAT-13: If appropriate, conduct emergence surveys on suitable roost trees proposed to be cleared during the summer active season (April 1-September 30 or April 1-November 15 if near a hibernacula) and if no bats are observed emerging fell the tree(s) immediately or as soon as possible after sunrise on the following day according to survey guidelines.
- CM-IBAT-14: Apply herbicides according to label instructions and utilizing targeted application methods (hack-and-squirt, basal bark, injections, cut-stump, or spot-spraying) and avoid application of pesticides in forested areas or in a manner that may result in transport or drift of pesticides into forested areas that are suitable habitat for Indiana bats.
- CM-IBAT-15: Avoid or limit the amount of nighttime noise caused by project activities during the summer active season and specifically avoid the Indiana bat non-volant pup season (May 15-July 31).
- CM-IBAT-16: When installing new or replacing existing permanent lights, utilize downward-facing lights with the same intensity or less for replacement lighting and direct temporary lighting away from suitable habitat especially during the pup-season (May 15-July 31).
- CM-IBAT-17: Prescribed fire within or adjacent to suitable forested habitat should include an average flame length of <8 feet, be conducted when temperatures are above 40 degrees Fahrenheit, and avoid the Indiana bat non-volant pup season (May 15-July 31).

3.2.2.3 Indiana Bat (*Myotis sodalis*) Critical Habitat – IBAT-CH

Habitat loss/degradation

- CM-IBAT-CH-1: Avoid and minimize impacts to critical habitat of the Indiana bat (The area designated as critical habitat for the Indiana bat in Illinois is Blackball Mine in LaSalle County).
- CM-IBAT-CH-2: Avoid mineral extraction (e.g. mine/quarry) or drilling/blasting into bedrock within buffer of designated critical habitat sites.
- CM-IBAT-CH-3: Avoid and minimize impacts to potential hibernacula habitat for the Indiana bat (caves or associated sinkholes, fissures, or other karst features) within the buffer of designated critical habitat sites.

- CM-IBAT-CH-4: Avoid or minimize the clearing or conversion of suitable Indiana bat summer habitat and limit it to less than 10 acres in total extent.

3.2.3 Birds

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Collision/Electrocution
- Habitat loss/degradation/fragmentation
- Disturbance
- Predation Risk

3.2.3.1 Piping Plover (*Charadrius melodus*) -PIPL

Habitat loss/degradation/fragmentation

- CM-PIPL-1: Avoid or minimize impacts to suitable piping plover habitat (Great Lakes shorelines that support open, sparsely vegetated sandy habitats, such as sand spits or sand beaches, that are associated with wide, unforested systems of dunes and inter-dune wetlands. Habitat also consists of Missouri River shoreline and sandbars. Potential stopover habitats during migration includes the shorelines of the Great Lakes and large lakes such as Lake Shelbyville, Carlyle, and Rend Lakes in Illinois.).

Disturbance/Predation Risk

- CM-PIPL-2: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering rivers/streams/lakes and other waterbodies.
- CM-PIPL-3: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-PIPL-4: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-PIPL-5: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-PIPL-6: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.
- CM-PIPL-7: Conduct project activities outside the piping plover breeding and nesting seasons and migration windows (April 1- August 31). (*primarily applicable in areas of known breeding and nesting, i.e. Lake Michigan Shoreline*)
- CM-PIPL-8: Avoid disturbance to species if present in the project action area.

3.2.3.2 Piping Plover (*Charadrius melodus*) Critical Habitat – PIPL-CH

Habitat loss/degradation/fragmentation

- CM-PIPL-CH-1: Avoid direct and indirect impacts to critical habitat of the piping plover (In Illinois, one unit has been designated on the Lake Michigan shoreline from Illinois Beach State Park to Waukegan Beach in Lake County.)

3.2.3.3 Rufa Red Knot (*Calidris canutus rufa*)

Habitat loss/degradation/fragmentation

- CM-REKN-1: Minimize impacts to suitable stopover habitat (Great Lakes region includes beaches, dunes, mudflats, peat banks, sandbars, or shoals along the coastline. Inland stopover habitats may include riverine habitats and manmade impoundments).

Disturbance

- CM-REKN-2: Conduct project activities outside of the rufa red knot migration window if possible (May 1-September 30).
- CM-REKN-3: Avoid disturbance to species if present in the project action area.

3.2.3.4 Whooping Crane (*Grus americana*)

Habitat loss/degradation/fragmentation

- CM-WHCR-1: Minimize impacts to potential or known stopover and overwintering habitat (During migration, whooping cranes use a variety of habitats; however, wetland mosaics appear to be the most suitable and they often use riverine habitats).

Disturbance

- CM-WHCR-2: Conduct project activities outside of the whooping crane migration and overwintering timeframe if possible (November 1 – March 31).
- CM-WHCR-3: Avoid disturbance to species if present in the project action area.

3.2.4 Reptiles

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure risk/harm

3.2.4.1 Alligator Snapping Turtle (*Macrochelys temminckii*) - AST

Habitat loss/degradation

- CM-AST-1: Avoid or minimize impacts to potential habitat (rivers/streams/oxbows and associated riparian areas, swamps, lakes, reservoirs, ponds, and adjacent upland areas).
- CR-AST-2: Utilities installed at water crossings should be directionally bored rather than trenched and installed with sufficient depth below stream bottoms so that they will not become exposed.

Exposure Risk/Disturbance

- CM-AST-3: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (stream, river, wetland, etc.) quantity or flow.
- CM-AST-4: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering rivers/streams and other waterbodies.
- CM-AST-5: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-AST-6: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-AST-7: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-AST-8: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.

3.2.4.2 Eastern Massasauga Rattlesnake (*Sistrurus catenatus*) - EMR

Habitat loss/degradation - In occupied areas

- CM-EMR-1: Avoid or minimize impacts to potential habitat; wet areas (wetlands, wet prairies, marshes, fens, sedge meadows, peatlands, scrub-shrub and floodplain forests, old fields, and roadside/drainage ditches) and adjacent upland areas (shrubland, open woodlands, prairie, grassland, riparian forest).
- CM-EMR-2: Avoid impacts to or modification of hibernation habitat (e.g. small mammal burrows, crayfish burrows, or tree root networks along the edge of wet areas or in adjacent upland areas) including impacts to hydrology (surface or groundwater conditions).

Exposure Risk/Disturbance - In occupied areas

- CM-EMR-3: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (stream, river, wetland, etc.) quantity or flow.
- CM-EMR-4: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of potential habitat of the species.
- CM-EMR-5: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-EMR-6: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-EMR-7: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-EMR-8: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.
- CM-EMR-9: Avoid construction of new roads through areas of suitable habitat and/or modification of existing roads (alignment/configuration/surface type) if the activity

would increase the risk of road mortality and/or create a permanent barrier to movement. Vehicles and equipment should be offloaded at the closest point to the work zone as practicable, on a road or parking areas, and utilize existing roads to access the work zone.

- CM-EMR-10: Avoid activities that would create a permanent barrier impacting the movement and dispersal (e.g. widening an existing road or trail, new road, trail, fence, wall, canal, etc.).
- CM-EMR-11: If installing erosion control fencing or other erosion control materials, utilize wildlife-safe materials (100% biodegradable and loose weave that allows animals to wiggle free) and avoid the use of plastic mesh netting or other similar material that could ensnare EMRs. When no longer required, temporary erosion and sediment control materials should be promptly removed.
- CM-EMR-12: Temporary exclusion fencing should be properly installed and maintained around work and staging areas to limit any EMR from entering the work and staging areas. These areas should be visually examined following fence installation and prior to the beginning of work to deem the project area snake free.
- CM-EMR-13: Limit any herbaceous vegetation (brush, shrubs, trees) removal to hand cutting and access the site on foot or using low-impact equipment such as lightweight, all-terrain vehicles (ATVs) or utility task vehicles (UTVs).

3.2.5 Fishes

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure risk/harm

3.2.5.1 Pallid Sturgeon (*Scaphirhynchus albus*) - PS

Habitat loss/degradation

- CM-PS-1: Avoid or minimize impacts to potential habitat (large rivers, specifically the Missouri and Mississippi Rivers and lower reaches of larger tributaries to these rivers). Limit impacts to 0.5 acres and/or less than 500 feet of shoreline.
- CR-PS-2: Utilities installed at river/stream crossings should be directionally bored rather than trenched and installed with sufficient depth below stream bottoms so that they will not become exposed.

Exposure Risk/Disturbance

- CM-PS-3: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (stream/river) quantity or flow.
- CM-PS-4: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering rivers/streams.

- CM-PS-5: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-PS-6: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-PS-7: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-PS-8: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.
- CR-PS-9: In-river activities should not occur from March 1 to June 30 to avoid impacts during the primary time frame for fish spawning and larval drift.
- CR-PS-10: Water intakes should be screened with a ¼-inch or smaller mesh and have an intake velocity of less than ½ ft/sec and be placed at water depths greater than 15 feet.

3.2.5.2 Topeka Shiner (*Notropis topeka*) - TS

Habitat loss/degradation - In occupied areas

- CM-TS-1: Avoid or minimize impacts to potential habitat (Small prairie streams with low to moderate flow, off-channel habitats such as oxbows, backwaters, and floodplain pools, ponds, dugouts and associated stream banks with grassy or vegetated margins).
- CR-TS-2: Utilities installed at river/stream crossings should be directionally bored rather than trenched and installed with sufficient depth below stream bottoms so that they will not become exposed.

Exposure Risk/Disturbance - In occupied areas

- CM-TS-3: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (stream, river, oxbow, etc.) quantity or flow.
- CM-TS-4: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering rivers/streams and other waterbodies.
- CM-TS-5: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-TS-6: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-TS-7: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-TS-8: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.

3.2.5.3 Topeka Shiner (*Notropis topeka*) Critical Habitat - TSCH

Habitat loss/degradation/fragmentation

- CM-TSCH-1: Avoid direct and indirect impacts to critical habitat of the topeka shiner (In Iowa, 25 stream segments have been designated) <https://www.fws.gov/species-publication-action/endangered-and-threatened-wildlife-and-plants-final-designation-23>

3.2.6 Clams-Freshwater Mussels

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure risk/harm

The stressors for the listed freshwater mussels are similar between species; thus, we are providing one list of conservation measures that are applicable to all the listed mussel species.

3.2.6.1 Freshwater Mussels (FM)

Habitat loss/degradation

- CM-FM-1: Avoid or minimize impacts to potential habitat (rivers and streams) with known occurrences of the species.
 - Iowa - Cedar, Iowa, Mississippi, Wapsipinicon Rivers
 - Illinois - Embarras, Kankakee, Mississippi, Rock, Saline River System (North Fork Saline and Lower Saline Rivers), Ohio, Vermilion River System (Middle Fork Vermilion, North Fork Vermilion, Middle Branch North Fork Vermilion, Salt Fork, and Vermilion Rivers), Wabash Rivers
- CR-FM-2: Utilities installed at river/stream crossings should be directionally bored rather than trenched and installed with sufficient depth below stream bottoms so that they will not become exposed.

Exposure Risk/Disturbance - In occupied areas

- CM-FM-3: Conduct a voluntary habitat assessment and presence/absence survey(s) within the action area following the Service's mussel survey guidelines. (Survey activities should be coordinated IL-IA ESFO)
- CM-FM-4: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (stream/river) quantity or flow.
- CM-FM-5: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering rivers/streams.
- CM-FM-6: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-FM-7: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-FM-8: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.

- CM-FM-9: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.

3.2.6.2 Rabbitsfoot Mussel (*Quadrula cylindrica cylindrica*) Critical Habitat – RABB-CH Habitat loss/degradation/fragmentation

- CM-RABB-CH: Avoid direct and indirect impacts to designated critical habitat of the rabbitsfoot mussel (In Illinois, critical habitat has been designated in the Ohio River and Vermilion River Watershed (North Fork Vermilion and Middle Branch North Fork Vermilion) <https://www.fws.gov/species-publication-action/designation-critical-habitat-neosho-mucket-and-rabbitsfoot-final-rule>

3.2.6.3 Sheepnose Mussel (*Plethobasus cyphus*) Critical Habitat – SHEEP-CH Habitat loss/degradation/fragmentation

- CM-SHEEP-CH: Avoid direct and indirect impacts to critical habitat of the sheepnose mussel (In Illinois, critical habitat has been designated in the Kankakee River and extends from the confluence of the Kankakee River with West Creek (Kankakee County, Illinois) downstream to its confluence with the Illinois River (Grundy County, Illinois). <https://ecos.fws.gov/ecp/species/6903#crithab>

3.2.6.4 Snuffbox Mussel (*Epioblasma triquetra*) Critical Habitat – SNUFF-CH

Habitat loss/degradation/fragmentation

- CM-SNUFF-CH: Avoid direct and indirect impacts to critical habitat of the snuffbox mussel (In Illinois, critical habitat has been designated in the Embarras River and extends from East County Road 1550 North Bridge on the border of Crittenden Township and Camargo Township (Douglas County, Illinois) downstream to the County Road 1200 North Bridge in Cottonwood Township (Cumberland County, Illinois). <https://www.fws.gov/species-publication-action/designation-critical-habitat-rayed-bean-sheepnose-snuffbox-and-1>

3.2.6.5 Spectaclecase (*Cumberlandia monodonta*) Critical Habitat – SPEC-CH

Habitat loss/degradation/fragmentation

- CM-SPEC-CH: Avoid direct and indirect impacts to critical habitat of the spectaclecase mussel (In Illinois and Iowa, critical habitat has been designated in the Mississippi River and extends from the downstream side of Lock and Dam 14 at Hampton (Rock Island County, Illinois) downstream to Lock and Dam 19 at Keokuk (Lee County, Iowa). <https://www.fws.gov/species-publication-action/designation-critical-habitat-rayed-bean-sheepnose-snuffbox-and-1>

3.2.7 Snails

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure Risk/Disturbance

3.2.7.1 Iowa Pleistocene Snail (*Discus macclintocki*) - IPS

Habitat loss/degradation

- CM-IPS-1: Avoid impacts to potential habitats (algific talus slope). The rarity and fragility of these slopes support the need for preservation of this unique habitat.

Exposure Risk/Disturbance

- CM-IPS-2: Implement measures to avoid or minimize erosion and sedimentation and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of potential habitats and/or surface water runoff to potential habitats.
- CM-IPS-3: Avoid disposing of or staging construction materials, chemicals, fuel, or other waste within sinkholes or potential habitat (algific talus slopes) or within drainages leading to a sinkhole or potential habitat.
- CM-IPS-4: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-IPS-5: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat (algific talus slopes) of the species.
- CM-IPS-6: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat (algific talus slopes) of the species.
- CM-IPS-7: Avoid or limit any disturbance (human foot traffic, livestock grazing and trampling) to areas (algific talus slopes) potentially occupied by the species.

3.2.8 Insects

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure risk/disturbance

3.2.8.1 Hine's Emerald Dragonfly (*Somatochlora hineana*) - HED

Habitat loss/degradation – In occupied area

- CM-HED-1: Avoid or minimize impacts to potential habitat (wet areas; wetlands, wet prairies, marshes, fens, sedge meadows and adjacent upland areas; shrubland, open woodlands, prairie, grassland).

Exposure Risk/Disturbance – In occupied areas

- CM-HED-2: Implement measures to avoid or minimize depletion or contamination of groundwater including contamination from fuel/chemical storage, septic systems, wells (water, oil, gas), etc. in areas occupied by the species.
- CM-HED-3: Avoid construction of new roads or railways through or adjacent to areas of suitable habitat and/or modification of existing roads (alignment/configuration/surface type) or railway if the activity would increase the risk of road mortality and/or cause habitat fragmentation.
- CM-HED-4: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-HED-5: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.
- CM-HED-6: Implement measures to avoid or minimize the influence of the action on groundwater and surface water (wetland, marshes, fens, etc.) quantity or flow.
- CM-HED-7: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of potential habitats and/or surface water runoff to potential habitat.
- CM-HED-8: Inspect equipment and materials for invasive species (plants or animals) and/or clean prior to arrival on site.
- CM-HED-9: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat and keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.

3.2.8.2 Hine's Emerald Dragonfly (*Somatochlora hineana*) Critical Habitat – HED-CH Habitat loss/degradation/fragmentation

- CM-HED-CH-1: Avoid and minimize impacts to critical habitat of the Hine's Emerald Dragonfly (In Illinois, critical habitat is designated in Cook, DuPage, and Will Counties) <https://www.fws.gov/species-publication-action/final-revised-critical-habitat-hines-emerald-dragonfly-somatochlora>

3.2.8.3 Monarch butterfly (*Danaus plexippus*) - MOBU Habitat loss/degradation - In occupied areas

- CM-MOBU-1: Avoid or minimize impacts to potential habitat (fields, roadside areas, open areas, wet areas, urban gardens, etc. with milkweed and floral resources/flowering plants present).

Exposure Risk/Harm - In occupied areas

- CM-MOBU-2: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat of the species.
- CM-MOBU-3: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.

- CM-MOBU-4: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of potential habitat of the species.
- CM-MOBU-5: Inspect equipment and materials for invasive species (plants or animals) and/or clean prior to arrival on site.
- CM-MOBU-6: Avoid disposing of or staging construction equipment, materials, chemicals, fuel, or other waste within or near potential habitat.
- CM-MOBU-7: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CR-MOBU-8: Complete project activities when the species are not present in the action areas (i.e. during the overwintering period).

3.2.8.4 Poweshiek Skipperling (*Oarisma poweshiek*) Critical Habitat – POSK-CH Habitat loss/degradation/fragmentation

- CM-POSK-CH-1: Avoid and minimize impacts to critical habitat of the Poweshiek skipperling (In Iowa, 11 critical habitat units are designated).
<https://www.fws.gov/species-publication-action/designation-critical-habitat-dakota-skipper-and-poweshiek-skipperling-1>

3.2.9 Crustaceans

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure Risk/Disturbance

3.2.9.1 Illinois Cave Amphipod (*Gammarus acherondytes*) - ICA Habitat loss/degradation

- CM-ICA-1: Avoid impacts to caves, associated sinkholes, or other karst features including mineral extraction (e.g. mine/quarry) or drilling/blasting into bedrock in areas of caves, sinkholes, or other karst features.
- CR-ICA-2: Establish or maintain a 50-foot minimum vegetated riparian buffer along streams or surface water drainages and around sinkhole or cave entrances.
 - https://www.nrcs.usda.gov/sites/default/files/2022-09/Riparian_Forest_Buffer_391_CPS_10_2020.pdf

Exposure Risk/Disturbance

- CM-ICA-3: Implement measures to avoid or minimize depletion or contamination of groundwater including contamination from fuel/chemical storage, septic systems, wells (water, oil, gas), etc.

- CM-ICA-4: Implement measures to avoid or minimize any runoff, sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering streams, sinkholes, cave systems, and/or abandoned wells.
- CM-ICA-5: Avoid disposing of or staging construction materials, chemicals, fuel, or other waste within or near sinkholes, streams, or drainages leading to a sinkhole, stream, or cave system.
- CM-ICA-6: Keep equipment free of leaks (oil, gas, lubricants) and other potential contaminants when working near or in areas of potential habitat.
- CM-ICA-7: Apply herbicides and pesticides (e.g. insecticide, fungicide, rodenticide, etc.) utilizing targeted application methods while maintaining a buffer (see product label) between sprayed areas and surface water, caves, sinkholes, and other karst features.
- CM-ICA-8: Apply herbicide, pesticides (e.g. insecticide, fungicide, rodenticide, etc.), fertilizers according to label instructions and under conditions that will limit drift, runoff, and potential contamination of surface and groundwater.

3.2.10 Plants

Qualifying actions typically involve one or more of the following stressors and the conservation measures provided below are intended to reduce potential adverse effects from these stressors:

- Habitat loss/degradation
- Exposure risk/disturbance

The stressors for the listed plants are similar between species; thus, we are providing one list of conservation measures that are applicable to all the listed plants species

3.2.10.1 Plants

Habitat loss/degradation

- CM-PLANTS-1: Avoid or minimize impacts to potential habitat and areas with known occurrences of the species.
 - Decurrent False Aster - moist, sandy floodplains and prairie wetlands along the Illinois and Mississippi River
 - Eastern Prairie Fringed Orchid - wet to mesic prairie and wetland communities (including sedge meadow, fen, marsh and marsh edge)
 - Lakeside Daisy - alvar habitat, which includes sparsely vegetated rock barrens/grasslands with shallow soils
 - Leafy Prairie Clover - thin-soiled (less than 18 inches deep) mesic and wet-mesic dolomite prairie, limestone cedar glades, and limestone barrens
 - Mead's Milkweed - mesic to dry mesic tallgrass prairie, hay meadows, and thin soil glades or barrens
 - Northern Wild Monkshood - shaded to partially shaded cliffs, algific talus slopes, and cool, streamside sites
 - Pitcher's Thistle - open sand dunes and low open beach ridges along the shorelines of Lakes Michigan

- Prairie Bush-Clover - disturbed tallgrass prairie habitats and undisturbed remnant prairie sites including dry, dry-mesic, mesic, or bedrock prairies
- Western Prairie Fringed Orchid - moist tallgrass prairies and sedge meadows

Exposure Risk/Disturbance - In occupied areas

- CM-PLANTS-2: Conduct a voluntary habitat assessment and presence/absence survey(s) within the action area. (Survey activities should be coordinated IL-IA ESFO)
- CM-PLANTS-3: Implement measures to avoid or minimize the influence of the action on groundwater and surface water in wetlands (including sedge meadow, fen, marsh and marsh edge) and wet to mesic prairies.
- CM-PLANT-4: Implement measures to avoid or minimize runoff, erosion and sedimentation, and/or contamination (herbicides, pesticides, fertilizer, human waste, animal waste, etc.) of surface water entering potential habitats.
- CM-PLANT-5: Inspect and/or clean all equipment and materials prior to arrival on site to remove any potential invasive species (plants or animals).
- CM-PLANT-6: Apply herbicides and pesticides utilizing targeted application methods while maintaining a buffer between sprayed areas and potential habitat or known populations of the species.
- CM-PLANT-7: Apply herbicide, pesticides, fertilizers according to label instructions and under conditions that will limit drift, runoff, and contamination of potential habitat of the species.

4 Covered species & Critical Habitat Descriptions

The following section includes a summary of relevant background information on the species and critical habitat(s) used to develop this standing analysis and covered by this DKey. A complete description of the species can be found on the Environmental Conservation Online System (ECOS) (<https://ecos.fws.gov>). This overview is included to inform the reader of the species prior to the analysis of the effects of the action presented below. Species and critical habitats within a project's action area that may be affected by the proposed action, but are not covered by this standing analysis, will require individual consultation with the IL-IAFO.

4.1 Mammals

4.1.1 Gray Bat (*Myotis grisescens*)

4.1.1.1 Species Summary

The gray bat is currently listed by USFWS under the ESA as 'endangered' across its range (USFWS 1976). At the time of listing, the main historical threats to the gray bat were human disturbance to roosting bats, environmental contamination, impoundment of waterways and roost modification or destruction. Such roost modifications include cave entrance or mine sealing and other modifications of the internal environment and entrances. The species is also negatively impacted by cave commercialization, improper gating and natural calamities, like cave-ins and flood events. Emerging threats, like interactions with wind turbines, climate change, and white-

nose syndrome have been added as potential threats, since gray bats were first federally listed (USFWS 2009). The USFWS species profile for the gray bat can be found at <https://ecos.fws.gov/ecp/species/6329>. Additional information can be found at <https://www.fws.gov/species/gray-bat-myotis-grisescens>. A summary of the ecology of this species can be found in the USFWS recovery plan (USFWS 1982) and 5-year review (USFWS 2009). No critical habitat has been designated for this species.

4.1.1.2 Biological Information

Gray bats are considered cave-obligate species, migrating seasonally between hibernating and maternity caves (USFWS 1982, 2009). These bats require caves that meet very specific conditions. In the summer, the maternity colonies will select a few caves near a water source that are warm (14°-25°C) (USFWS 2009). In contrast, the caves used for hibernation in the winter are typically deep, vertical caves with temperatures between 1°-9°C, multiple entrances, and good air flow. Gray bats will also use non-cave summer roost sites, such as dams, mines, quarries, concrete box culverts and crevices under bridges.

Male gray bats will arrive at the hibernacula first in the fall (mainly in September and October) to mate with the females before they enter hibernation (USFWS 2009). The females become pregnant upon emergence from hibernation in late March to early April, giving birth to a single pup in late May or early June. The females form maternity colonies during the summer timeframe near foraging locations, and the bachelor males will segregate into separate aggregations within a colony home range (USFWS 2009).

The foraging habits of these bats are strongly correlated with open water of rivers, streams, lakes, or reservoirs (USFWS 2009). They are highly dependent on aquatic insects such as mayflies, caddisflies, and stoneflies, but will also opportunistically eat beetles and moths. Thus, water quality and keeping riparian zones intact are important to the foraging habits of gray bats.

4.1.1.3 Distribution & Critical Habitat Designation

The gray bat generally occupies limestone karst areas of the southeastern United States (USFWS 1982). Within the covered area of this standing analysis, gray bats are only known to occur in the southern portion of Illinois.

<https://www.fws.gov/species/gray-bat-myotis-grisescens/map>

Critical habitat has not been designated in Illinois or Iowa for the gray bat.

4.1.2 Indiana Bat (*Myotis sodalis*)

4.1.2.1 Species Summary

The Indiana bat is currently listed by USFWS under the ESA as ‘endangered’ across its range (USFWS 1967). Threats to the species include human disturbance of hibernating bats, commercialization of caves where the bats hibernate, loss of summer habitat, pesticides and other contaminants, and most recently, the disease white-nose syndrome. The USFWS species profile for the Indiana bat can be found at <https://ecos.fws.gov/ecp/species/5949>. Additional information can be found at <https://www.fws.gov/species/indiana-bat-myotis-sodalis> and at

<https://www.whitenosesyndrome.org/>. A summary of the ecology of this species can be found in the USFWS draft recovery plan (USFWS 2007) and the most recent 5-year review (USFWS 2019). Critical habitat has been designated in Illinois for this species (USFWS 1977).

4.1.2.2 Biological Information

The fall swarming period near hibernacula in Illinois and Iowa occurs from August 16 to November 15 (USFWS 2026). At this time, mating occurs, and bats will forage on flying insect prey in the vicinity of the hibernaculum to gain weight prior to hibernation. In Illinois and Iowa, Indiana bats spend the winter timeframe (November 16 to March 31) in hibernacula in caves and other cave-like locations (e.g., abandoned mines) (USFWS 2026). These caves generally have a large volume with large rooms and vertical or extensive passages, helping to buffer the cave environment against rapid and extreme changes in outside temperature. The ambient temperature of the hibernacula typically remains below 10°C (50°F) and is relatively stable throughout the winter.

Females typically emerge from hibernation in Illinois and Iowa during the April 1 to May 14 Spring staging timeframe and prepare for migration to the summer home range. During the summer occupancy (April 1 to September 30) timeframe, reproductive females will form maternity colonies in suitable summer habitat (USFWS 2007, 2026). Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures (USFWS 2026). This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 5 inches diameter-at-breast-height (dbh) that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of another forested/wooded (USFWS 2026). Indiana bats have also been observed roosting in human-made structures, such as bridges, culverts, tunnels and bat houses (artificial roost structures); therefore, these structures should also be considered potential summer habitat.

Examples of unsuitable habitat:

- Individual trees that are greater than 1,000 feet from forested/wooded areas
- Trees found in highly developed urban areas (e.g., street trees, downtown areas); and
- A pure stand of less than 5-inch dbh trees that are not mixed with larger trees

While trees < 5 inches dbh that have exfoliating bark, cracks, crevices, and/or hollows may have some potential to be male Indiana bat summer roosting habitat, the Service does not consider early successional, even-aged stands of trees < 5 inches dbh to be suitable roosting habitat. However, early successional habitat with small diameter trees may be used as foraging habitat.

4.1.2.3 Distribution & Critical Habitat Designation

The Indiana bat has a distribution that is widespread, ranging across most of the Midwest to the Northeast and into the Southeast (USFWS 2007, 2019). Indiana bats are known to occur throughout most of Illinois and within the southeast portion of Iowa.

<https://www.fws.gov/species/indiana-bat-myotis-sodalis/map>

The only area designated as critical habitat for the Indiana bat in Illinois is Blackball Mine in LaSalle County (USFWS 1976, 1977).

4.2 Birds

4.2.1 Piping Plover (*Charadrius melodus*)

4.2.1.1 Species Summary

The piping plover is currently listed by USFWS under the ESA as ‘endangered’ in the Great Lakes watershed and ‘threatened’ in the Great Plains (USFWS 1985). Threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, disease, predation, and unpredictable changes in the environment. The USFWS species profile for the piping plover can be found at <https://ecos.fws.gov/ecp/species/6039>. Additional information can be found at <https://www.fws.gov/species/piping-plover-charadrius-melodus>. A summary of the ecology of this species can be found in the USFWS piping plover recovery plan (USFWS 2003) and 5-year review (USFWS 2020). Critical habitat was designated for the Great Lakes breeding population of piping plover (USFWS 2001).

4.2.1.2 Biological Information

In the Great Lakes region, piping plovers' nest, feed, and rear their young in open, sparsely vegetated sandy areas (USFWS 2003). These areas include sand spits and sand beaches with wide, unforested dunes and swales or in the flat pans behind the primary dune. In the Great Plains, piping plovers' nest on the unvegetated shorelines of alkaline lakes, reservoirs, or river shorelines and sandbars (USFWS 2015).

Piping plovers begin arriving in to breeding grounds in April, and most mated pairs are nesting by mid- to late May (USFWS 2003, 2015). Male plovers create a shallow depression on the ground which both adults line with small pebbles. Eggs hatch between late May and early July, with chicks fledging 21 to 30 days after hatching (USFWS 2003, 2015). The young leave their nest within hours and begin foraging immediately. Although piping plovers typically produce one brood per year, they sometimes have two broods during a summer. Piping plovers feed on exposed beach surfaces by pecking for invertebrates that are just below the surface. They feed mostly during the day and eat insects, marine worms, crustaceans, and mollusks as well as eggs and larvae of flies and beetles. Most adults depart for their wintering grounds by mid-August with juveniles following a few weeks later (USFWS 2003). These birds can only tolerate a low level of disturbance at the beginning of the nesting period during nest site selection, egg laying, and incubation, but can tolerate higher levels of disturbance as the nesting season progresses.

4.2.1.3 Distribution & Critical Habitat Designation

Piping plovers have 3 disparate breeding populations (USFWS 1985): The Great Lakes, the Northern Great Plains, and the Atlantic Coast. Individuals from all 3 breeding populations winter along the Atlantic and Gulf coastal areas from North Carolina to Texas. In Iowa, the species is primarily known from the Missouri River and in Illinois the species is known from the Great Lakes shoreline and migration stopover sites in central Illinois (USFWS 2024). Piping plovers appear to be low-density migrants throughout the midcontinent and are often observed singly, or in small groups, that use sites *opportunistically*, meaning that they do not have regularly used stopover sites (USFWS 2015). In 2019, a pair of piping plovers had their first successful nesting site at Montrose Beach in Chicago, Illinois in more than 60 years (USFWS 2024).

<https://www.fws.gov/species/piping-plover-charadrius-melodus/map>

Critical habitat is designated for the Great Lakes and Northern Great Plains breeding population of piping plover (USFWS 2001, 2002). No critical habitat has been designated in Iowa for the piping plover. The Service designated 35 units of critical habitat in eight states for the Great Lakes breeding population of the piping plover, including approximately 323 kilometers (201 miles) of mainland and island shoreline (USFWS 2001). In Illinois, one unit has been designated from Illinois Beach State Park to Waukegan Beach in Lake County. Within the critical habitat units, only the areas that contain the physical and biological features of piping plover habitat are designated as critical habitat.

The primary constituent elements required to sustain the Great Lakes breeding population of the piping plover are found on Great Lakes islands and mainland shorelines that support open, sparsely vegetated sandy habitats, such as sand spits or sand beaches, that are associated with wide, unforested systems of dunes and inter-dune wetlands (USFWS 2001). In order for habitat to be physically and biologically suitable for piping plovers, it must have a total shoreline length of at least 0.2 kilometers (0.12 miles) of gently sloping, sparsely vegetated (less than 50 percent herbaceous and low woody cover) sand beach with a total beach area of at least 2 hectares (5 acres). Appropriately sized sites must also have areas of at least 50 meters (164 feet) in length where (1) the beach width is more than 7 meters (23 feet), (2) there is protective cover for nests and chicks, and (3) the distance to the tree line (from the normal high-water line to where the forest begins) is more than 50 meters (164 feet). Beach width is defined as the distance from the normal high-water line to the foredune (a low barrier dune ridge immediately inland from the beach) edge, or to the sand/vegetation boundary in areas where the foredune is absent. The beach width may be narrower than 7 meters (23 feet) if appropriate sand and cobble areas of at least 7 meters (23 feet) exist between the dune and the tree line.

Protective cover for nests and chicks consists of small patches of herbaceous vegetation, cobble (stones larger than 1 centimeter (0.4 inches diameter), gravel (stones smaller than 1 centimeter (0.4 inches diameter), or debris such as driftwood, wrack, root masses, or dead shrubs. These areas must have a low level of disturbance from human activities and from domestic animals. As the nesting season progresses, the level of disturbance tolerated by piping plovers increases. A lower level of disturbance is required at the beginning of the nesting period during nest site selection, egg laying, and incubation. Beach activities that may be associated with a high level of disturbance include, but are not limited to, walking pets off leash, loud noise, driving all-terrain

vehicles (ATVs), or activities that significantly increase the level of people using the beach. The level of disturbance is relative to the proximity to the nest, intensity, and frequency of these and other similar activities.

The dynamic ecological processes that create and maintain piping plover habitat are also important primary constituent elements. These geologically dynamic lakeside regions are controlled by processes of erosion, accretion, plant succession, and lake-level fluctuations. The integrity of the habitat depends upon regular sediment transport processes, as well as episodic, high magnitude storm events. By their nature, Great Lakes shorelines are in a constant state of change; habitat features may disappear or be created nearby. The critical habitat boundaries reflect these natural processes and the dynamic character of Great Lakes shorelines.

See <https://www.fws.gov/species-publication-action/etwp-final-determination-critical-habitat-great-lakes-breeding> for more information about piping plover CH in Illinois.

4.2.2 Rufa Red Knot (*Calidris canutus rufa*)

4.2.2.1 Species Summary

The rufa red knot is currently listed by USFWS under the ESA as ‘threatened’ across its range (USFWS 2014). Major threats to this species include the loss of both breeding and nonbreeding habitat, likely effects related to disruption of natural predator cycles on breeding grounds, reduced prey availability throughout nonbreeding range, and increasing frequency and severity of asynchronies (mismatches) in the timing of the annual migratory cycle relative to favorable food and weather conditions. The USFWS species profile can be found at <https://ecos.fws.gov/ecp/species/1864>. Additional information can be found at <https://www.fws.gov/species/rufa-red-knot-calidris-canutus-rufa>. A summary of the ecology of the species can be found in the recovery plan (USFWS 2023), the 5-year review (USFWS 2021) and the species status assessment (USFWS 2020).

4.2.2.2 Biological Information

Red knot suitable habitat in the Great Lakes region includes beaches, dunes, mudflats, peat banks, sandbars, or shoals. In many wintering and stopover areas, quality high tide roosting habitat (i.e., close to feeding areas, protected from predators, with sufficient space, free from excessive human disturbance) is limited (USFWS 2023). In non-breeding habitats, rufa red knot requires unvegetated or sparsely vegetated sand or mud flats and wash over areas with broad, unvegetated zones and little to no topographic relief to avoid predators (USFWS 2020). Inland stopover habitats may include riverine wetlands and manmade impoundments (USFWS 2023).

4.2.2.3 Distribution & Critical Habitat Designation

The rufa red knot is a migratory shorebird that breeds in the Canadian Arctic and winters in the southeastern United States, the Caribbean, Central America, and South America. Some rufa red knots fly more than 14,967 km (9,300 mi) from south to north every spring and repeat the trip in reverse every autumn, making this bird one of the longest-distance migrants in the animal kingdom (USFWS 2023). Major migration stopover and staging areas occur along the Gulf and Atlantic coasts of North and South America; however, rufa red knots also use sites in the Great

Lakes region as stopover areas during migration and have been regularly sighted in inland areas of the United States within the Atlantic and central flyways, including the coasts of the Great Lakes (USFWS 2020). Migration sightings in the Great Lakes region may occur in May through September, with peaks in May and mid-July (USFWS 2020).

<https://www.fws.gov/species/rufa-red-knot-calidris-canutus-rufa/map>

No critical habitat has been designated in Illinois or Iowa for the rufa red knot.

4.2.3 Whooping Crane (*Grus americana*)

4.2.3.1 Species Summary

The whooping crane is currently listed by USFWS under the ESA as ‘endangered’ (USFWS 1967) and is listed as experimental, non-essential in Illinois and Iowa. Threats include loss of wetlands to cropland conversion, urbanization, roads and powerlines, as well as wind farms, has a significant negative impact to the migratory corridor used by whooping cranes. Furthermore, decreases in river flows have degraded riverine migration habitat for this species and development is also encroaching on salt marsh habitat that is used by whooping cranes in the winter. The USFWS species profile can be found at <https://ecos.fws.gov/ecp/species/758>. Additional information can be found at <https://www.fws.gov/species/whooping-crane-grus-americana>. A summary of the ecology of the species can be found in the recovery plan (USFWS 2007) and the 5-year review (USFWS 2012).

4.2.3.2 Biological Information

The whooping crane breeds, migrates, winters, and forages in a variety of wetland and other habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields (USFWS 2007). During migration, whooping cranes use a variety of habitats; however, wetland mosaics appear to be the most suitable. For feeding, whooping cranes primarily use shallow, seasonally and semi permanently flooded palustrine wetlands for roosting, and various cropland and emergent wetlands. In Nebraska, whooping cranes also often use riverine habitats.

4.2.3.3 Distribution & Critical Habitat Designation

The historical range of the whooping crane from north to south range included Canada and the United State to Mexico, and its east to west range included the Rocky Mountains to the East Coast (USFWS 2012). Specific states where occurrence of this species was documented include Alabama, Arkansas, Colorado, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin and Wyoming.

Four geographically distinct populations exist in the wild, as noted in the 5-year review (USFWS 2012):

1. Aransas Wood Buffalo Population – The only natural, self-sustaining population in existence migrates between Aransas National Wildlife Refuge on the Texas Coast and Wood Buffalo National Park in Alberta, Canada
2. Central Florida – An experimental, non-migratory population that was reintroduced from 1993 to 2005
3. Eastern Migratory Population – An experimental population that was reintroduced from 2001 to 2010 and migrates between Wisconsin and Florida
4. White Lake, Louisiana - A non-migratory flock that was introduced in 2011

Illinois and Iowa are within the eastern migratory population, and the species is often observed at stopover sites during migration. Autumn migration normally begins in mid-September, with most birds arriving on the wintering grounds between late October and mid-November (USFWS 2007). The species is also known to overwinter or spend portions of the winter at sites in Illinois. The primary migratory and overwintering window in Illinois and Iowa is October 1 – March 31 (USFWS 2007).

<https://www.fws.gov/species/whooping-crane-grus-americana/map>

No critical habitat has been designated for this species in Illinois or Iowa.

The Service has determined a non-essential population is not necessary for the continued existence of the species. For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and as a proposed species on all other Federal, state and private land (no section 7(a)(2) requirements, but Federal agencies must conference with the Service if their activities are likely to jeopardize the existence non-essential experimental populations (section 7(a)(4))).

4.3 Reptiles

4.3.1 Alligator Snapping Turtle (*Macrochelys temminckii*)

4.3.1.1 Species Summary

The alligator snapping turtle is proposed to be listed by the USFWS under the ESA as ‘threatened’ across its range with section 4(d) rule (USFWS 2021b). Threats to the species include harvest, poaching, bycatch, habitat alteration, and nest predators and parasites. The USFWS species profile for the alligator snapping turtle can be found at <https://ecos.fws.gov/ecp/species/4658>. Additional information can be found at <https://www.fws.gov/species/alligator-snapping-turtle-macrochelys-temminckii>. A summary of the ecology of this species can be found in the USFWS Species Status Assessment (USFWS 2021a).

4.3.1.2 Biological Information

Alligator snapping turtles are generally found in deeper water of large rivers and their major tributaries; however, they are also found in a wide variety of habitats, including small streams, bayous, canals, swamps, lakes, reservoirs, ponds, and oxbows (a lake that forms when a meander

of a river is cut off) USFWS (2021a). Alligator snapping turtles are also associated with woody debris (e.g., tree root masses, stumps, submerged trees, etc.); and may occupy areas with a high percentage of canopy cover undercut stream banks. Females nest on land near water and nesting occurs in the May to July timeframe (USFWS 2021a).

4.3.1.3 Distribution & Critical Habitat Designation

The species historical range included Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, Texas (USFWS 2021b). In Illinois, the species is currently known to occur in the Clear Creek Watershed in Union County.

<https://www.fws.gov/species/alligator-snapping-turtle-macrochelys-temminckii>

No critical habitat has been proposed for this species.

4.3.2 Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)

4.3.2.1 Species Summary

The eastern massasauga rattlesnake is currently listed by USFWS under the ESA as ‘threatened’ across its range (USFWS 2016a). Habitat loss and fragmentation of wetlands from development and vegetative succession (i.e., invasion of woody species) are the most prevalent threats (USFWS 2021a). Other threats include persecution and collection, road mortality, hydrologic fluctuation, habitat management practices (e.g., mowing and prescribed fire), and disease (USFWS 2016b). The USFWS species profile for the eastern massasauga rattlesnake can be found at <https://ecos.fws.gov/ecp/species/2202>. Additional information can be found at <https://www.fws.gov/species/eastern-massasauga-sistrurus-catenatus>. A summary of the ecology of this species can be found in the USFWS eastern massasauga rattlesnake recovery plan (USFWS 2021a), the most recent 5-year review (USFWS 2021b) and the current Species Status Assessment (USFWS 2016b).

4.3.2.2 Biological Information

Eastern massasauga rattlesnakes live in wet areas, including wet prairies, marshes, fens, sedge meadows, peatlands, and low areas along rivers and lakes (USFWS 2016b). In the active season, the species uses habitats that have open canopy wetlands with adjacent upland areas. They also use adjacent uplands (shrubland, open woodlands, prairie) during part of the year. Eastern massasauga rattlesnakes hibernate below the frostline in crayfish burrows but may also be found under logs and tree roots or in small mammal burrows. Unlike other rattlesnakes, massasaugas hibernate alone. EMRs usually begin to emerge in late March to early April from their hibernacula and remain active until November, depending on weather conditions (USFWS 2016b). This snake is highly cryptic in nature and solitary, hibernating alone or in small clusters and persisting with low density populations, which makes them difficult to detect. During the mating season, which is thought to take place in summer and early fall, the males will pursue females, resulting in longer daily movements and defensive behavior (USFWS 2016b). Most massasaugas mate in late summer and give birth about a year later. Litter size varies from 5 to 20 young.

4.3.2.3 Distribution & Critical Habitat Designation

The historical range stretched from western New York and Pennsylvania and southeastern Ontario, Canada through northern Indiana, Illinois, and Ohio and southern Michigan to southeastern Minnesota, eastern Missouri and Iowa (2016a). In Illinois, the species is currently known from Bond and Clinton counties and in Iowa the species is currently known from Bremer, Muscatine, and Scott counties (USFWS 2021b).

<https://www.fws.gov/species/eastern-massasauga-sistrurus-catenatus/map>

No critical habitat has been designated for this species.

4.4 Fishes

4.4.1 Pallid Sturgeon (*Scaphirhynchus albus*)

4.4.1.1 Species Summary

The pallid sturgeon is currently listed by USFWS under the ESA as ‘endangered’ across its range (USFWS 1990). Limiting factors include: 1) activities which affect in-river connectivity and the natural form, function, and hydrologic processes of rivers; 2) illegal harvest; 3) impaired water quality and quantity; 4) entrainment; and 5) life history attributes of the species (i.e., delayed sexual maturity, females not spawning every year, and larval drift requirements) (USFWS 2014). The degree to which these factors affect the species varies among river reaches. The USFWS species profile for the pallid sturgeon can be found at <https://ecos.fws.gov/ecp/species/7162>. Additional information can be found at <https://www.fws.gov/species/pallid-sturgeon-scapirhynchus-albus>. A summary of the ecology of this species can be found in the USFWS pallid sturgeon revised recovery plan (USFWS 2014) and the most recent 5-year review (USFWS 2021).

4.4.1.2 Biological Information

The pallid sturgeon is native to the Missouri and Mississippi rivers and adapted to the pre-development habitat conditions that historically existed in these rivers (USFWS 2014). These conditions generally can be described as large, free-flowing, warm-water, and turbid rivers with a diverse assemblage of dynamic physical habitats. Pallid Sturgeon primarily utilize main channel, secondary channel, and channel border habitats throughout their range. Juvenile and adult pallid sturgeon are rarely observed in habitats lacking flowing water which are removed from the main channel (i.e., backwaters and sloughs). Specific patterns of habitat use, and the range of habitat parameters used may vary with availability and by life stage, size, age, and geographic location.

Pallid sturgeon is a migratory species. They move throughout the Missouri and Mississippi river systems and are built for migrating through swift flowing, muddy water. Spawning appears to occur between March and July, with lower latitude fish spawning earlier than those in the northern portion of the range (USFWS 2014). Adult pallid sturgeon can move long distances upstream prior to spawning. When pallid sturgeon are ready to spawn, they can migrate 100 miles or more to reproduce. Females usually spawn every two years while males spawn almost every year after reaching maturity. Males mature at about 5 to 10 years old while females will not mature until about 15 to 20 years old. If spawning and egg hatch is successful, their *larvae*,

or newly hatched fish, drift down the river for about seven days for many, sometimes hundreds, of miles. After that, they settle down to eat and grow.

4.4.1.2 Distribution & Critical Habitat Designation

The historical distribution of the pallid sturgeon includes the Missouri and Yellowstone rivers in Montana downstream to the Missouri-Mississippi confluence and the Mississippi River possibly from near Keokuk, Iowa downstream to New Orleans, Louisiana. Pallid Sturgeon also were documented in the lower reaches of some of the larger tributaries to the Missouri, Mississippi, and Yellowstone rivers (USFWS 2014). The pallid sturgeon contemporary range includes the Missouri and Mississippi rivers, sections of their major tributaries, mainstem Missouri River reservoirs, and the Atchafalaya River (USFWS 2021). In Illinois, the species is known from the Mississippi River and in Iowa the species is known from the Missouri River.

<https://www.fws.gov/species/pallid-sturgeon-scaphirhynchus-albus/map>

No critical habitat has been designated for this species.

4.4.2 Topeka Shiner (*Notropis topeka*)

4.4.2.1 Species Summary

The topeka shiner is currently listed by USFWS under the ESA as ‘endangered’ across its range (USFWS 1998). Habitat loss, fragmentation, land conversions, and introduction of potential predators are a few of the factors that have impacted topeka shiner populations in certain geographic portions of the historic range (USFWS 2021a). The overarching factor most significantly affecting the species is the altered hydrology of prairie streams primarily resulting from land use changes, large numbers of impoundments constructed, and physical alterations affecting stream channels. The USFWS species profile for the topeka shiner can be found at <https://ecos.fws.gov/ecp/species/4122>. Additional information can be found at <https://www.fws.gov/species/topeka-shiner-notropis-topeka>. A summary of the ecology of this species can be found in the USFWS topeka shiner recovery plan (USFWS 2021a) and the most recent 5-year review (USFWS 2021b).

4.4.2.2 Biological Information

The Topeka shiner (*Notropis topeka*) is a small minnow that lives and breeds in pools of low-order prairie streams, oxbows, ponds, and dugouts in the Great Plains states of South Dakota, Minnesota, Nebraska, Iowa, Kansas, and Missouri (USFWS 2021a). Occupied habitats generally have relatively small channels which may flow perennially or intermittently into larger downstream streams or rivers. The species typically occupies pools with varying substrates (e.g., cobble, silt and detritus). The Topeka shiner uses pools with little or no flow that occur either within the stream channel or off channel. It is generally more tolerant of conditions that may exclude many typically co-occurring fishes (i.e. high-water temperatures, low dissolved oxygen). Topeka shiners are small, rapidly maturing, short-lived fishes with early maturation, a protracted spawning strategy, rapid larval growth, and rapid population turnover rates.

4.4.2.3 Distribution & Critical Habitat Designation

The species historical range included Iowa, Kansas, Minnesota, Missouri, Nebraska, South Dakota. In Iowa, the species is known from the Boone/Des Moines River, North Raccoon River, and Rock River Watersheds (USFWS 2021b).

<https://www.fws.gov/species/topeka-shiner-notropis-topeka/map>

The Service designated critical habitat for the Topeka shiner in 2004 in Minnesota, Nebraska, and Iowa (USFWS 2004). In Iowa, critical habitat is designated in the North Raccoon River, Boone, and Rock River Watersheds.

The primary constituent elements of critical habitat for the Topeka shiner consist of 1. Streams most often with permanent flow, but that can become intermittent during dry periods; 2. Side-channel pools and oxbows either seasonally connected to a stream or maintained by groundwater inputs, at a surface elevation equal to or lower than the bank full discharge stream elevation. The bank full discharge is the flow at which water begins leaving the channel and flowing into the floodplain; this level is generally attained every 1 to 2 years. Bank full discharge, while a function of the size of the stream, is a fairly constant feature related to the formation, maintenance, and dimensions of the stream channel; 3. Streams and side-channel pools with water quality necessary for unimpaired behavior, growth, and viability of all life stages. The water quality components can vary seasonally and include—temperature (1 to 30°C), total suspended solids (0 to 2000 ppm), conductivity (100 to 800 µS/cm), dissolved oxygen (4 ppm or greater), pH (7.0 to 9.0), and other chemical characteristics; 4. Living and spawning areas for adult Topeka shiner with pools or runs with water velocities less than 0.5 meters/second (approx. 20 inches/second) and depths ranging from 0.1 to 2.0 meters (approximately 4 to 80 inches); 5. Living areas for juvenile Topeka shiners with water velocities less than 0.5 meters/second (approx. 20 inches/second) with depths less than 0.25 meters (approx. 10 inches) and moderate amounts of instream aquatic cover, such as woody debris, overhanging terrestrial vegetation, and aquatic plants; 6. Sand, gravel, cobble, and silt substrates with amounts of fine sediment and substrate embeddedness that allows for nest building and maintenance of nests and eggs by native *Lepomis* sunfishes (green sunfish, orangespotted sunfish, longear sunfish) and Topeka shiner as necessary for reproduction, unimpaired behavior, growth, and viability of all life stages; 7. An adequate terrestrial, semiaquatic, and aquatic invertebrate food base that allows for unimpaired growth, reproduction, and survival of all life stages; 8. A hydrologic regime capable of forming, maintaining, or restoring the flow periodicity, channel morphology, fish community composition, off channel habitats, and habitat components described in the other primary constituent elements; and 9. Few or no nonnative predatory or nonnative competitive species present.

<https://www.fws.gov/species-publication-action/endangered-and-threatened-wildlife-and-plants-final-designation-23>

4.5 Clams - Freshwater Mussels

4.5.1 Clubshell (*Pleurobema clava*)

4.5.1.1 Species Summary

The clubshell mussel is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1993). Reasons for its decline in the upper Ohio and Wabasha watersheds are mainly due to pollution from agricultural run-off and industrial wastes, and extensive impoundments for navigation. The USFWS species profile for the clubshell can be found at <https://ecos.fws.gov/ecp/species/3789>. Additional information can be found at <https://www.fws.gov/species/clubshell-pleurobema-clava>. A summary of the ecology of this species can be found in the USFWS recovery plan (USFWS 1994) and the most recent five-year review (USFWS 2019).

4.5.1.2 Biological Information

The clubshell is a freshwater mussel that prefers clean, loose sand and gravel in medium to small rivers and streams (USFWS 1994). Clubshell mussels will bury themselves in the bottom substrate to depths of up to four inches and reproduction requires a stable, undisturbed habitat and a sufficient population of fish hosts to complete the mussel’s larval development. The striped shiner (*Notropis chrysocephalus*), central stoneroller (*Campostoma anomalum*), blackside darter (*Percina maculata*), and logperch (*Percina caprodes*) have been capable of serving as hosts of the clubshell under laboratory conditions (O'Dee and Watters 2000).

4.5.1.3 Distribution & Critical Habitat Designation

The clubshell mussel used to be ubiquitous throughout the Ohio River system, found in most tributaries throughout Kentucky, Illinois, Indiana, and Ohio and in more isolated systems in Michigan, Pennsylvania, and West Virginia (USFWS 1994). In Illinois, the clubshell is known from the Ohio River and has been reintroduced into the Vermilion River watershed (Salt Fork, Middle Fork and Vermilion Rivers) (USFWS 2019).

No critical habitat has been designated for this species.

4.5.2 Fanshell (*Cyprogenia stegaria*)

4.5.2.1 Species Summary

The fanshell mussel is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1990). Threats include impoundments, navigation projects, pollution, and habitat alterations (USFWS 1991). The USFWS species profile for the fanshell can be found at <https://ecos.fws.gov/ecp/species/4822>. Additional information can be found at <https://www.fws.gov/species/fanshell-cyprogenia-stegaria>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 1991) and the most recent five-year review (USFWS 2019).

4.5.2.2 Biological Information

The fanshell mussel is endemic to the Ohio River system and is found in flowing water with stable substrate containing a relatively firm and clean gravel, sand, and silt mixture (USFWS 1990). They are often associated with other riverine mussel species that also prefer this habitat.

4.5.2.3 Distribution & Critical Habitat Designation

This species can be found in various rivers in Alabama, Illinois, Indiana, Kentucky, Ohio, Tennessee, Virginia and West Virginia – all within the Ohio River basin. In Illinois, the fanshell is only known from the Ohio and Wabash Rivers (USFWS 1990).

No critical habitat has been designated for this species.

4.5.3 Fat Pocketbook (*Potamilus capax*)

4.5.3.1 Species Summary

The fat pocketbook pearly mussel is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1976). Primary threats to the species include destruction, modification, and curtailment of the historical habitats throughout its range, primarily due to navigation and flood control activities such as impoundment, channelization, channel maintenance, and dredging (USFWS 1989). The USFWS species profile for the fat pocketbook can be found at <https://ecos.fws.gov/ecp/species/2780>. Additional information can be found at <https://www.fws.gov/species/fat-pocketbook-potamilus-capax>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 1989) and the most recent five-year review (USFWS 2025).

4.5.3.2 Biological Information

The fat pocketbook is known to the Ohio River system and has been collected from sand, silt, and mixed sand/gravel substrates at depths ranging from a few inches to more than 20 feet (USFWS 1989). They have also been collected from secondary and side channel habitats. The species is commonly collected with other with other riverine mussel species. The most common host fish for the fat pocketbook is the freshwater drum (*Aplodinotus grunniens*) (USFWS 2025).

4.5.3.2 Distribution & Critical Habitat Designation

The fat pocketbook was historically found in Arkansas, Illinois, Indiana, Iowa, Kentucky, Mississippi, Missouri, and Ohio. In Illinois, the fat pocketbook is known from the Wabash, Ohio, and Saline River System (North Fork Saline and Lower Saline Rivers) (USFWS 2025). The species is potentially extirpated from the Upper Mississippi River and tributaries to the Upper Mississippi River in Iowa.

No critical habitat has been designated for this species.

4.5.4 Higgins Eye (*Lampsilis higginsii*)

4.5.4.1 Species Summary

The Higgin’s eye pearly mussel is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1976). Habitat loss and degradation and exotic species are major threats to the survival of the Higgins eye. Impounded river systems have altered the water flow patterns, substrate characteristics, and host fish habitat, which has severely affected how the mussels feed, live, and reproduce. The USFWS species profile for the Higgin’s eye can be found at <https://ecos-test.fws.gov/ecp/species/F009>. Additional information can be found at <https://www.fws.gov/species/higgins-eye-lampsilis-higginsii>. A summary of the ecology of this

species can be found in the USFWS Recovery Plan (USFWS 2004) and the most recent five-year review (USFWS 2019).

4.5.4.2 Biological Information

The Higgins eye pearly mussel is usually found in deep water with moderate currents and stable substrate that vary from sand to boulders and can possibly live up to 50 years (USFWS 2004). The animals bury themselves in the substrate of the river bottoms with just the edge of their partially opened shells exposed. They are usually found in mussel beds that contain at least five other species, as noted in the 2004 recovery plan. The sauger, walleye, yellow perch, largemouth and smallmouth bass, as well as freshwater drum are considered suitable hosts for Higgins eye glochidia (USFWS 2004).

4.5.4.3 Distribution & Critical Habitat Designation

Since 1980, live Higgins eye have been found in parts of the upper Mississippi River north of Lock and Dam 19 at Keokuk, Iowa and in three tributaries of the Mississippi River: the St. Croix River between Minnesota and Wisconsin, the Wisconsin River in Wisconsin and the lower Rock River, between Illinois and Iowa (USFWS 2004). Recently, the Service and conservation partners successfully reintroduced the Higgins eye into the Iowa River and Wapsipinicon River in Iowa. The current range is about 50% of the historic range, which extended as far south as St. Louis, Missouri and included several additional tributaries of the Mississippi River (USFWS 2019).

<https://www.fws.gov/species/higgins-eye-lampsilis-higginsii/map>

No critical habitat has been designated for this species.

4.5.5 Longsolid (*Fusconaia subrotunda*)

4.5.5.1 Species Summary

The longsolid mussel is currently listed by the USFWS under the ESA as ‘threatened’ across its range (USFWS 2023). Threats include habitat fragmentation from dams and other barriers; habitat loss; degraded water quality from chemical contamination and erosion from poorly managed development, agriculture, mining, and timber operations; direct mortality from dredging and harvest; and the proliferation of invasive species, such as the zebra mussel. The USFWS species profile for the longsolid can be found at <https://ecos.fws.gov/ecp/species/9880>. Additional information can be found at <https://www.fws.gov/species/long-solid-fusconaia-subrotunda>. A summary of the ecology of this species can be found in the USFWS Species Status Assessment (USFWS 2022).

4.5.5.2 Biological Information

The longsolid shows a preference for sand and gravel in streams and small rivers but also may be found in coarse gravel and cobble in larger rivers (USFWS 2022). In streams and rivers, they can be found at depths less than two feet, but in large rivers can be commonly found at depths of 12 to 18 feet; but also, at depths of over 20 feet.

4.5.5.3 Distribution & Critical Habitat Designation

Historically, the longsolid was found in four basins: the Great Lakes, Ohio, Cumberland, and Tennessee River basins. However, the longsolid is considered extirpated from the Great Lakes basin and is found predominantly in the Ohio basin, which drains portions of New York, Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Illinois, and Indiana. The species is known from the Ohio River basin but is considered extirpated in Illinois (USFWS 2022).

<https://www.fws.gov/species/long-solid-fusconaia-subrotunda/map>

Critical habitat has not been designated in Illinois for the longsolid.

4.5.6 Northern Riffleshell (*Epioblasma torulosa rangiana*)

4.5.6.1 Species Summary

The northern riffleshell is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1993). Numerous threats persist for the remaining northern riffleshell populations, including invasive species, the effects of small population sizes, habitat alteration, land-use changes, changing precipitation and temperature patterns, and point and non-point source pollution. The USFWS species profile for the northern riffleshell can be found at <https://ecos.fws.gov/ecp/species/527>. Additional information can be found at <https://www.fws.gov/species/northern-riffleshell-epioblasma-torulosa-rangiana>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 1994) and the most recent five-year review (USFWS 2019).

4.5.6.2 Biological Information

This mussel is found in a wide variety of streams, including large streams and small rivers, where it buries itself in firmly packed sand or gravel in riffle areas (USFWS 1994). Like all freshwater mussels, northern riffleshell require a stable, undisturbed habitat and a sufficient population of host fish for reproduction.

4.5.6.3 Distribution & Critical Habitat Designation

The northern riffleshell was historically found in Illinois, Indiana, Kentucky, Michigan, Ohio, Pennsylvania, West Virginia, and western Ontario. It was widespread in the Ohio and Maumee River basins, and in tributaries of western Lake Erie. In Illinois, the northern riffleshell has been reintroduced into the Vermilion River watershed (USFWS 2019).

<https://www.fws.gov/species/northern-riffleshell-epioblasma-torulosa-rangiana/map>

No critical habitat has been designated for this species.

4.5.7 Orangefoot Pimpleback (*Plethobasus cooperianus*)

4.5.7.1 Species Summary

The orangefoot pimpleback is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1976). The species is at risk of water quality impacts, dredging, damming, and adjacent land development that have fragmented and degraded the species’ habitat (USFWS 2022). The USFWS species profile for the pink mucket can be found at <https://ecos.fws.gov/ecp/species/1132>. Additional information can be found at

<https://www.fws.gov/species/orange-footed-pearly-mussel-plethobasus-cooperianus>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 1984) and the most recent five-year review (USFWS 2022).

4.5.7.2 Biological Information

The orangefoot pimpleback is thought to be a typical, long-lived unionid mussel and is found in sand and gravel substrates of large rivers (USFWS 1984). The species is extremely rare compared to other native mussels, even where it is found.

4.5.7.3 Distribution & Critical Habitat Designation

The species historical range included Alabama, Illinois, Indiana, Iowa, Kentucky, Ohio, Pennsylvania, Tennessee. In Illinois, the orangefoot pimpleback is only known from the Ohio River (USFWS 2022).

<https://www.fws.gov/species/orange-footed-pearly-mussel-plethobasus-cooperianus/map>

No critical habitat has been designated for this species.

4.5.8 Pink Mucket (*Lampsilis abrupta*)

4.5.8.1 Species Summary

The pink mucket is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1976). Threats to the species include navigational activities, reservoir releases, mining practices, inadequately treated wastewater discharges, factors associated with small disjunct populations, and habitat fragmentation (USFWS 2019). The USFWS species profile for the pink mucket can be found at <https://ecos.fws.gov/ecp/species/7829>. Additional information can be found at <https://www.fws.gov/species/pink-mucket-lampsilis-abrupta>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 1985) and the most recent five-year review (USFWS 2019). No critical habitat has been designated for this species.

4.5.8.2 Biological Information

Pink mucket is found in medium to large rivers with moderate to fast flowing water and silt to boulders, rubble, gravel, and sand substrates (USFWS 1985).

4.5.8.3 Distribution & Critical Habitat Designation

The pink mucket historically had a widespread distribution throughout the Ohio, Cumberland, and Tennessee River Basins (USFWS 1985). In Illinois, the pink mucket is only known from the Ohio River (USFWS 2019).

<https://www.fws.gov/species/pink-mucket-lampsilis-abrupta/map>

No critical habitat has been designated for this species.

4.5.9 Rabbitsfoot (*Quadrula cylindrica cylindrica*)

4.5.9.1 Species Summary

The rabbitsfoot is currently listed by the USFWS under the ESA as 'threatened' across its range (USFWS 2013). The rabbitsfoot faces a variety of threats from declines in water quality, altered hydrology, riparian habitat fragmentation and deterioration of instream habitat. The USFWS species profile for the rabbitsfoot can be found at <https://ecos.fws.gov/ecp/species/5165>. Additional information can be found at <https://www.fws.gov/species/rabbitsfoot-quadrula-cylindrica-cylindrica>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 2023), the most recent five-year review (USFWS 2020), and the species status assessment (USFWS 2021).

4.5.9.2 Biological Information

Suitable habitat for the rabbitsfoot occurs in small to medium-sized streams and some larger rivers (USFWS 2021). Bottom substrates generally include a mixture of sand and gravel. Because adults do not typically burrow into sediment but rather lies horizontally on the surface, flow refuges may decrease the likelihood of displacement into unsuitable habitat. Several species of fish have been identified as host fish for rabbitsfoot (USFWS 2020, 2021).

4.5.9.3 Distribution & Critical Habitat Designation

This mussel is found in rivers and streams in Alabama, Arkansas, Georgia, Kansas, Kentucky, Illinois, Indiana, Louisiana, Mississippi, Missouri, Ohio, Oklahoma, Pennsylvania, Tennessee, and West Virginia. The Service estimates that the rabbitsfoot has been extirpated from 63-70% of the watersheds in its historical range (USFWS 2021). In Illinois, the rabbitsfoot is known from the Ohio River and Vermilion River watershed (North Fork, Middle Branch North Fork, and Jordan Creek) (USFWS 2020).

<https://www.fws.gov/species/rabbitsfoot-quadrula-cylindrica-cylindrica/map>

Critical habitat has been designated in Illinois for this species within the Ohio River and Vermilion River (North Fork and Middle Branch North Fork Rivers) Watershed (USFWS 2015). The primary constituent elements of critical habitat for the species are: (1) Geomorphically stable river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support a diversity of freshwater mussel and native fish (such as stable riffles, sometimes with runs, and mid-channel island habitats that provide flow refuges consisting of gravel and sand substrates with low to moderate amounts of fine sediment and attached filamentous algae). (2) A hydrologic flow regime (the severity, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the mussel's and fish host's habitat, food availability, spawning habitat for native fishes, and the ability for newly transformed juveniles to settle and become established in their habitats. (3) Water and sediment quality (including, but not limited to, conductivity, hardness, turbidity, temperature, pH, ammonia, heavy metals, and chemical constituents) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages. (4) The occurrence of natural fish assemblages, reflected by fish species richness, relative abundance, and community composition, for each inhabited river or creek that will serve as an

indication of appropriate presence and abundance of fish hosts necessary for recruitment of the rabbitsfoot. Suitable fish host for rabbitsfoot may include, but are not limited to, blacktail shiner (*Cyprinella venusta*) from the Black and Little River and cardinal shiner (*Luxilus cardinalis*), red shiner (*C. lutrensis*), spotfin shiner (*C. spiloptera*), bluntface shiner (*C. camura*), rainbow darter (*Etheostoma caeruleum*), rosyface shiner (*Notropis rubellus*), striped shiner (*L. chrysocephalus*), and emerald shiner (*N. atherinoides*). (5) Competitive or predaceous invasive (nonnative) species in quantities low enough to have minimal effect on survival of freshwater mussels.

See the listing in the Federal Register for more information on critical habitat for the species.

<https://www.fws.gov/species-publication-action/designation-critical-habitat-neosho-mucket-and-rabbitsfoot-final-rule>

4.5.10 Ring Pink (*Obovaria retusa*)

4.5.10.1 Species Summary

The ring pink is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1989). The most significant threats identified in the recovery plan (i.e., conversion of free-flowing rivers to impoundments, decreased availability of fish host(s), and sedimentation of habitat from channel dredging and gravel mining) continue to impact the species, and no viable populations of the species are believed to exist. The USFWS species profile for the ring pink can be found at <https://ecos.fws.gov/ecp/species/4128>. Additional information can be found at <https://www.fws.gov/species/golf-stick-pearly-mussel-obovaria-retusa>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 1991) and the most recent five-year review (USFWS 2019).

4.5.10.2 Biological Information

The ring pink typically occurs in medium to large rivers and is believed to prefer a mixture of silt, sand, and gravel substrate (USFWS 1991).

4.5.10.3 Distribution & Critical Habitat Designation

The species historical range included Alabama, Illinois, Indiana, Kentucky, Ohio, Pennsylvania, Tennessee, West Virginia. In Illinois, the ring pink is only known from the Ohio River (USFWS 2019).

<https://www.fws.gov/species/golf-stick-pearly-mussel-obovaria-retusa/map>

No critical habitat has been designated for this species.

4.5.11 Rough Pigtoe (*Pleurobema plenum*)

4.5.11.1 Species Summary

The rough pigtoe is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1976). Threats to the rough pigtoe include water quality degradation from point and non-point sources, hydrologic and water quality alterations resulting from the operation of impoundments, and instream activities such as sand and gravel dredging (USFWS 2021). The USFWS species profile for the rough pigtoe can be found at

<https://ecos.fws.gov/ecp/species/6894>. Additional information can be found at <https://www.fws.gov/species/rough-pigtoe-pleurobema-plenum>. A summary of the ecology of this species can be found in the USFWS recovery plan (USFWS 1984) and the most recent five-year review (USFWS 2021).

4.5.11.2 Biological Information

The rough pigtoe mussel is found in medium to large rivers (20 m wide or greater) in sand and gravel substrates (USFWS 1984).

4.5.11.3 Distribution & Critical Habitat Designation

Currently, all streams known to contain rough pigtoe occur within the Ohio River basin (USFWS 2021). In Illinois, the rough pigtoe is only known from the Ohio River.

<https://www.fws.gov/species/rough-pigtoe-pleurobema-plenum/map>

No critical habitat has been designated for this species.

4.5.12 Salamander Mussel (*Simpsonaias ambigua*)

4.5.12.1 Species Summary

The salamander mussel is proposed to be listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 2023b). The primary threat to survival of this species is contaminants, hydrological regime, landscape alterations, lack of connectivity, invasive species, and host vulnerability. The USFWS species profile for the salamander mussel can be found at <https://www.fws.gov/species/salamander-mussel-simpsonaias-ambigua>. A summary of the ecology of this species can be found in the USFWS Species Status Assessment (USFWS 2023a).

4.5.12.2 Biological Information

The salamander mussel is frequently found bedding under flat rocks in rivers, streams, creeks, or lakes of moderate flow (USFWS 2023a). It is the only North American freshwater mussel species within the Unionidae family known to have a non-fish host, the mudpuppy (*Necturus maculosus*), for reproduction.

4.5.12.3 Distribution & Critical Habitat Designation

The salamander mussel is found across 14 U.S. States (Arkansas, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Tennessee, West Virginia, and Wisconsin) and Ontario, Canada. In Illinois, the salamander mussel is known from the Kankakee, Ohio, and Upper Sangamon Rivers and Vermilion River watershed and is known from the Mississippi River in Iowa (USFWS 2023b).

<https://www.fws.gov/species/salamander-mussel-simpsonaias-ambigua/map>

Critical habitat has been proposed for this species; however, there is no critical habitat proposed in Iowa or Illinois for the species. See the listing in the Federal Register for more information on proposed critical habitat for the species (USFWS 2023b).

<https://www.fws.gov/species-publication-action/endangered-species-status-salamander-mussel-and-designation-critical>

4.5.13 Sheepnose (*Plethobasus cyphus*)

4.5.13.1 Species Summary

The sheepnose mussel (formerly referred to as the bullhead mussel) is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 2012). Primary risks that affect the species include contaminants, hydrological regime, landscape alterations, lack of connectivity and invasive species. The USFWS species profile for the sheepnose can be found at <https://ecos.fws.gov/ecp/species/6903>. Additional information can be found at <https://www.fws.gov/species/sheepnose-plethobasus-cyphus>. A summary of the ecology of this species can be found in the USFWS sheepnose 5-year review (USFWS 2020) and the species status assessment (USFWS 2022).

4.5.13.2 Biological Information

Sheepnose is a medium-sized, thick-shelled species that has an estimated lifespan of approximately 30 years (USFWS 2022). It inhabits medium to large river systems, typically within shallow shoal habitats with moderate to swift currents over mixtures of coarse sand, gravel, and clay. Evidence suggests that habitat ranges from riffles a few inches deep to runs approximately 20 feet (6 m) in depth (USFWS 2024). To-date, laboratory studies have identified more than 30 species of suitable host fish, with varying degrees of juvenile production; however, documentation of natural infestations has been limited to sauger (*Sander canadensis*) and mimic shiner (*Notropis volucellus*) (USFWS 2022).

4.5.13.3 Distribution & Critical Habitat Designation

This species is historically known from the Mississippi, Ohio, Cumberland, Tennessee, and Ohio River main stems, and scores of tributary streams range wide. The sheepnose is currently considered extant within the Kankakee, Mississippi, Ohio, and Rock Rivers in Illinois and the Mississippi River in Iowa (USFWS 2022).

<https://www.fws.gov/species/sheepnose-plethobasus-cyphus/map>

Critical habitat has been designated for this species and includes one unit in Illinois (USFWS 2026). The unit in Illinois consists of 51 river miles (82 river kilometers) of the Kankakee River in Grundy, Kankakee, and Will Counties, Illinois and extends from the confluence of the Kankakee River with West Creek (Kankakee County, Illinois) downstream to its confluence with the Illinois River (Grundy County, Illinois). The unit includes the river channel up to the ordinary high-water mark.

<https://ecos.fws.gov/ecp/species/6903#crithab>

Within this area, the physical or biological features essential to the conservation of the sheepnose consist of the following: (i) Adequate flows, or a hydrological flow regime (magnitude, timing, frequency, duration, rate of change, and overall seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain stream connectivity. (ii)

Suitable substrates and connected instream habitats, characterized by geomorphologically stable stream channels and banks (i.e., channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) that support the sheepsnose and its host fishes. For sheepsnose, suitable substrates are firm or stable coarse sand, gravel, or rock free from excessive silt. (iii) Water and sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages. Additionally, concentrations of contaminants, including (but not limited to) ammonia, nitrate, copper, and chloride, are below acute toxicity levels for mussels. (iv) The presence and abundance of host fishes necessary for recruitment of sheepsnose (mimic shiner (*Notropis volucellus*) and sauger (*Sander canadensis*)).

See the listing in the Federal Register for more information on critical habitat for the species.

<https://www.federalregister.gov/documents/2026/04/27/2026-08146/endangered-and-threatened-wildlife-and-plants-designation-of-critical-habitat-for-the-rayed-bean>

4.5.14 Snuffbox (*Epioblasma triquetra*)

4.5.14.1 Species Summary

The snuffbox is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 2012). Current or potential future threats to snuffbox habitat include contaminants, reduced water quality, sedimentation, inadequate hydrological regime, landscape alteration, and lack of connectivity, and invasive species are the primary risk factors influencing the resources upon which the snuffbox relies, either directly or indirectly (USFWS 2022). The USFWS species profile for the snuffbox can be found at <https://ecos.fws.gov/ecp/species/4135>. Additional information can be found at <https://www.fws.gov/species/snuffbox-epioblasma-triquetra>. A summary of the ecology of this species can be found in the USFWS snuffbox’s most recent 5-year review (USFWS 2019) and its species status assessment (USFWS 2022).

4.5.14.2 Biological Information

The mussel is found in rivers, streams, creeks, or lakes, in areas of moderate flow, in sand and gravel substrate (USFWS 2022). There are several known host fish for the snuffbox, including species of darters and sculpins with logperch (*Percina caprodes*) being the primary host (USFWS 2024).

4.5.14.3 Distribution & Critical Habitat Designation

Historically, the snuffbox was widespread, occurring in 211 streams and lakes in 18 states and Ontario, Canada (USFWS 2022). The population has been reduced to 83 streams and lakes in 14 states and Ontario. The snuffbox is currently found in Alabama, Arkansas, Illinois, Indiana, Kentucky, Michigan, Minnesota, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, Wisconsin, and Ontario, Canada. Most populations are small and geographically isolated from one another, further increasing their risk of extinction. In Illinois, the snuffbox is only known from the Embarras River.

<https://www.fws.gov/species/snuffbox-epioblasma-triquetra/map>

Critical habitat has been designated for this species and includes one unit in Illinois (USFWS 2026). The unit in Illinois consists of 71 river miles (114 river kilometers) of the Embarras River in Coles, Douglas, and Cumberland Counties, Illinois. The unit extends from the East County Road 1550 North Bridge on the border of Crittenden Township and Camargo Township (Douglas County, Illinois) downstream to the County Road 1200 North Bridge in Cottonwood Township (Cumberland County, Illinois). The unit includes the river channel up to the ordinary high-water mark. Within this area, the physical or biological features essential to the conservation of the snuffbox mussel consist of the following: (i) Adequate flows, or a hydrological flow regime (magnitude, timing, frequency, duration, rate of change, and overall seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain stream connectivity. (ii) Suitable substrates and connected instream habitats, characterized by geomorphologically stable stream channels and banks (i.e., channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) that support the snuffbox and its host fishes. For snuffbox, suitable substrates are stable gravel and sand with moderate flow and aquatic vegetation in and adjacent to riffles and shoals. (iii) Water and sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages. Additionally, concentrations of contaminants, including (but not limited to) ammonia, nitrate, copper, and chloride, are below acute toxicity levels for mussels. (iv) The presence and abundance of host fishes necessary for recruitment of snuffbox (logperch (*Percina caprodes*), and darter and sculpin species).

See the listing in the Federal Register for more information on critical habitat for the species.

<https://www.federalregister.gov/documents/2026/04/27/2026-08146/endangered-and-threatened-wildlife-and-plants-designation-of-critical-habitat-for-the-rayed-bean>

4.5.15 Spectaclecase (*Cumberlandia monodonta*)

4.5.15.1 Species Summary

The spectaclecase mussel is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 2012). The USFWS species profile for the spectaclecase mussel can be found at <https://ecos.fws.gov/ecp/species/7867>. Additional information can be found at <https://www.fws.gov/species/spectaclecase-cumberlandia-monodonta>. A summary of the ecology of this species can be found in the USFWS spectaclecase most recent 5-year review (USFWS 2025), species status assessment (USFWS 2022), and recovery plan (USFWS 2024).

4.5.15.2 Biological Information

Spectaclecase is a large, long-lived species, inhabits larger stream systems, and is generally found in microhabitats sheltered from both high and low extremes in flow, often found to be aggregated under slab boulders or bedrock shelves where they are protected from the current (USFWS 2024). Spectaclecase is the only known North American freshwater mussel species to use goldeye (*Hiodon alosoides*) and mooneye (*Hiodon tergisus*) as hosts for reproduction (USFWS 2025).

4.5.15.3 Distribution & Critical Habitat Designation

Historically, the spectaclecase was found in at least 44 streams of the Mississippi, Ohio, and Missouri River basins in 14 states (USFWS 2012). It has been extirpated from three states and today is found in only 20 streams. The current range includes Alabama, Arkansas, Illinois, Iowa, Kentucky, Minnesota, Missouri, Tennessee, Virginia, West Virginia and Wisconsin. In Illinois, spectaclecase is known from the Mississippi and Ohio Rivers and in Iowa is known from the Mississippi River (USFWS 2025).

<https://www.fws.gov/species/spectaclecase-cumberlandia-monodonta/map>

Critical habitat has been designated for this species and includes one unit in Illinois and Iowa (USFWS 2026). The unit consists of 132 river miles (213 river kilometers) of the Mississippi River in Scott, Muscatine, Louisa, Des Moines, and Lee Counties, Iowa, and Rock Island, Mercer, Henderson, and Hancock Counties, Illinois. The unit extends from the downstream side of Lock and Dam 14 at Hampton (Rock Island County, Illinois) downstream to Lock and Dam 19 at Keokuk (Lee County, Iowa). The unit occurs within Mississippi River Pools 15, 16, 17, 18, and 19, and the unit includes the river channel up to the ordinary high-water mark. Within these areas, the physical or biological features essential to the conservation of spectaclecase consist of the following: (i) Adequate flows, or a hydrological flow regime (magnitude, timing, frequency, duration, rate of change, and overall seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain stream connectivity. (ii) Suitable substrates and connected instream habitats, characterized by geomorphologically stable stream channels and banks (i.e., channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) that support the spectaclecase and its host fishes. For spectaclecase, these substrates are firm or stable substrates of coarse sand and gravel, are free from excessive silt, and typically include large rock, slabs, or boulders. (iii) Water and sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages. Additionally, concentrations of contaminants, including (but not limited to) ammonia, nitrate, copper, and chloride, are below acute toxicity levels for mussels. (iv) The presence and abundance of host fishes necessary for recruitment of spectaclecase (mooneye (*Hiodon tergisus*) and goldeye (*Hiodon alosoides*)).

See the listing in the Federal Register for more information on the critical habitat for the species.

<https://www.federalregister.gov/documents/2026/04/27/2026-08146/endangered-and-threatened-wildlife-and-plants-designation-of-critical-habitat-for-the-rayed-bean>

4.6 Snails

4.6.1 Iowa Pleistocene Snail (*Discus macclintocki*)

4.6.1.1 Species Summary

The Iowa Pleistocene snail is currently listed by the USFWS under the ESA as ‘endangered’ across its range (USFWS 1978). Threats come from logging, quarrying, road building, sinkhole filling and contamination, as well as human foot traffic, livestock grazing and trampling. The USFWS species profile for the species can be found at <https://ecos.fws.gov/ecp/species/534>. Additional information can be found at <https://www.fws.gov/species/iowa-pleistocene-snail->

[discus-macclintocki](#). A summary of the ecology of this species can be found in the most recent 5-year review (USFWS 2020) and its recovery plan (USFWS 1984).

4.6.1.2 Biological Information

As Pleistocene glaciers retreated, the Iowa Pleistocene snail survived in small, fragmented pockets of suitable habitat known as algific talus slopes (USFWS 1984). These geologically unique slopes are found throughout the Driftless Area, which extends across the Paleozoic Plateau of eastern Iowa, northwest Illinois, southwest Wisconsin, and southeast Minnesota. Algific talus slopes are generally described as rocky, cold-air producing, steep north-facing slopes. These slopes are usually limited in area to a few hundred square feet or less, are generally along streams, and are typically steep and unstable. Slopes have high moisture content, thick vegetation, and scattered vents blowing cold air. The cold air is localized around a vent and extends into surrounding soil. The rarity and fragility of these slopes support the need for preservation of this unique habitat.

4.6.1.3 Distribution & Critical Habitat Designation

Historically the species was found in Iowa, Nebraska, northern Missouri, west and central Illinois, Indiana and Ohio. Currently the species is known from Clayton, Delaware, Dubuque, Fayette, and Jackson Counties, Iowa, and from one location in Jo Daviess County, Illinois (USFWS 2020).

<https://www.fws.gov/species/iowa-pleistocene-snail-discus-macclintocki/map>

No critical habitat has been designated for this species.

4.7 Insects

4.7.1 Hine's Emerald Dragonfly (*Somatochlora hineana*)

4.7.1.1 Species Summary

The Hine's emerald dragonfly is currently listed by the USFWS under the ESA as 'endangered' across its range (USFWS 1995). Destruction and modification of habitat continue to be the greatest threat to the Hine's emerald dragonfly (USFWS 2024). Many of the threats to habitat vary across the range of the species but also vary in magnitude and ability to be mitigated. Direct loss of habitat is the most severe threat but occurs infrequently due to laws protecting wetlands and measures taken to preserve habitat. Other threats to hydrology or from fragmentation and contamination can also have a permanent impact on habitat and even entire populations of the species but our ability to manage or prevent these threats is limited. Invasive plant species is the most widespread of the threats; however, the magnitude of this threat and our ability to manage it depends on the invasive species and the degree that it has encroached upon Hine's emerald dragonfly habitat. The USFWS species profile for the species can be found at <https://ecos.fws.gov/ecp/species/7877>. Additional information can be found at <https://www.fws.gov/species/hines-emerald-somatochlora-hineana>. A summary of the ecology of this species can be found in the most recent 5-year review (USFWS 2024) and its recovery plan (USFWS 2001).

4.7.1.2 Biological Information

Hine's emerald dragonfly live in wetlands that are dominated by grass or grass-like plants and fed primarily by water from a mineral source or fens (Swink and Wilhelm 1994). Three important characteristics common to wetlands that are inhabited by Hine's emerald dragonfly appear to be groundwater fed, with shallow water that is slowly flowing through vegetation, dolomitic bedrock or calcareous limestone, and co-inhabited by crayfish, like devil crayfish (*Lacunicambarus diogenes*) (USFWS 2001). The flowing water can range from barely detectable sheet flow to deeper, small well-defined streamlet channels. Parts of the streamlet channels are usually covered by vegetation such as cattails or sedges. These slow-moving aquatic systems provide appropriate habitat for larval development. Soil types of these aquatic systems can range from organic muck to mineral soils like marl. Two other important components of these wetland complexes are open, vegetated areas and nearby or adjacent forest edge and uplands. Areas of open vegetation serve as places to forage. Forest edge, trees or shrubs, near or adjacent, to fens provide areas which may concentrate insect prey and provide protected areas for Hine's emerald dragonfly to perch and roost.

4.7.1.3 Distribution & Critical Habitat Designation

The species historical range included Alabama, Illinois, Indiana, Michigan, Missouri, Ohio, Wisconsin. The current distribution includes Illinois, Michigan, Missouri, and Wisconsin. In Illinois, the species is known from Cook, DuPage, Will, and Winnebago Counties including the Lower DesPlaines River Valley (USFWS 2024).

<https://www.fws.gov/species/hines-emerald-somatochlora-hineana/map>

Critical habitat for the species was first designated on September 5, 2007 (72 FR 51101) and later revised on April 23, 2010 (75 FR 21393) (USFWS 2010). A total of 37 units, encompassing approximately 26,531.8 acres (10,737 hectares) in Cook, DuPage, and Will Counties in Illinois; Alpena, Mackinac, and Presque Isle Counties in Michigan; Crawford, Dent, Iron, Phelps, Reynolds, Ripley, Washington, and Wayne Counties in Missouri; and Door and Ozaukee Counties in Wisconsin, were included in the designation. In Illinois, 7 units are designated in Cook, DuPage, and Will Counties. The primary constituent elements (physical and biological features) of critical habitat for the Hine's emerald dragonfly are: (i) For egg deposition and larval growth and development: organic soils (histosols, or with organic surface horizon) overlying calcareous substrate (predominantly dolomite and limestone bedrock); calcareous water from intermittent seeps and springs and associated shallow, small, slow-flowing streamlet channels, rivulets, and/or sheet flow within fens; emergent herbaceous and woody vegetation for emergence facilitation and refugia; occupied burrows maintained by crayfish for refugia; and prey base of aquatic macroinvertebrates, including mayflies, aquatic isopods, caddisflies, midge larvae, and aquatic worms. (ii) For adult foraging, reproduction, dispersal, and refugia necessary for roosting, for resting, for adult females to escape from male harassment, and for predator avoidance (especially during the vulnerable teneral stage): natural plant communities near the breeding/larval habitat which may include fen, marsh, sedge meadow, dolomite prairie, and the fringe (up to 328 ft (100 m)) of bordering shrubby and forested areas with open corridors for movement and dispersal; and prey base of small, flying insect species (e.g., dipterans). For more

information on CH for Hine’s emerald dragonfly in, see <https://www.fws.gov/species-publication-action/final-revised-critical-habitat-hines-emerald-dragonfly-somatochlora>.

4.7.2 Monarch Butterfly (*Danaus plexippus*)

4.7.2.1 Species Summary

The monarch butterfly is proposed to be listed by the USFWS under the ESA as ‘threatened with Section 4(d) rule’ (USFWS 2024). Threats include ongoing impacts from loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence (i.e., deterioration with age), and incompatible management of overwintering sites in California; and drought (USFWS 2024). The USFWS species profile for the monarch butterfly can be found at <https://www.fws.gov/species/monarch-danaus-plexippus>. A summary of the ecology of this species can be found in the USFWS Species Status Assessment (USFWS 2020) and listing document (USFWS 2024).

4.7.2.2 Biological Information

Monarch butterflies require healthy and abundant milkweed plants for both laying eggs on and as a food source for caterpillars (USFWS 2020). By consuming milkweed plants, monarchs obtain toxins, called cardenolides, that provide a defense against predators. Additionally, a wide variety of blooming nectar resources (flowers) are needed for adults throughout the breeding season, migration and overwintering. For overwintering monarchs, habitat with a specific microclimate is needed for protection from the elements, as well as moderate temperatures to avoid freezing. These conditions vary between populations.

Each fall, the eastern and western North American monarchs go into a state of suspended reproduction, known as diapause, and begin migrating to their respective overwintering sites (USFWS 2020, 2024). The eastern population of monarchs travel up to 3,000 miles during migration traveling from Canada, through the U.S. and down to Mexico, a trip that may last more than two months. In early spring, surviving monarchs break diapause and mate at the overwintering sites before dispersing. The same individuals that undertook the initial southward migration begin flying back through the breeding grounds. Monarchs begin their lifecycle as eggs, which are laid on milkweed plants and hatch after two to five days. The eggs hatch into caterpillars and progress through five instars over the next two weeks before pupating into a green and gold chrysalis. An adult monarch will emerge one to two weeks later. After several generations of monarch offspring in the spring and summer, a new generation begins the fall migration for the first time. Most breeding adult butterflies live approximately two to five weeks, but overwintering adults that enter reproductive diapause can live six to nine months.

4.7.2.3 Distribution & Critical Habitat Designation

Originally native to North America, the monarch butterfly has dispersed to other parts of the world and non-migratory populations are found from islands in the Pacific Ocean to the western edge of Europe (USFWS 2020). Despite this expansion, most monarchs continue to live and migrate in North America. North American migratory monarchs are divided into eastern and western populations. The Rocky Mountains generally divide these two populations, limiting their

contact. However, the two populations are not completely isolated from each other and still occasionally interbreed. For the eastern North American population, most monarchs overwinter in oyamel fir tree roosts located in mountainous regions of central Mexico. Monarchs living west of the Rocky Mountains in North America primarily overwinter in California at sites along the Pacific Coast, roosting in eucalyptus, Monterey pines and Monterey cypress trees. There are also non-migratory monarchs that remain year-round at the southern end of their breeding range in North America, including in parts of Florida, the Gulf Coast and California.

<https://www.fws.gov/species/monarch-danaus-plexippus/map>

Critical habitat has been proposed for the species; however, there is no critical habitat proposed in Iowa or Illinois for the species (USFWS 2024).

4.7.3 Poweshiek Skipperling CH (*Oarisma poweshiek*)

4.7.3.1 Species Summary

The poweshiek skipperling is currently listed by the USFWS under the ESA as ‘endangered’ (USFWS 2014). Threats include habitat loss and degradation of native prairies and prairie fens and other natural or manmade factors, including loss of genetic diversity, small size and isolation of sites, indiscriminate use of herbicides such that it reduces or eliminates nectar sources, climate conditions such as drought, direct mortality from fire and other management activities or natural occurrences, direct or indirect mortality from indiscriminate use of pesticides, and other unknown stressors. The USFWS species profile can be found at <https://ecos.fws.gov/ecp/species/9161>. Additional information can be found at <https://www.fws.gov/species/poweshiek-skipperling-oarisma-poweshiek>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 2022) and the most recent five-year review (USFWS 2019).

4.7.3.2 Biological Information

Poweshiek skipperling habitat includes prairie fens, grassy lake and stream margins, moist meadows, sedge meadow and wet-to dry native prairie (USFWS 2022). Historically, the species was found on both dry and wet native prairies across the Midwest. The species relies on remaining remnant, or unplowed, native prairies and has not been found in reconstructed prairies.

4.7.3.3 Distribution & Critical Habitat Designation

The species historical range included Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, South Dakota, Wisconsin. Poweshiek skipperling are extant in one Michigan county, one prairie complex in Manitoba and perhaps one location in Wisconsin (USFWS 2019). They are thought to be extirpated from North Dakota, South Dakota, Minnesota, Iowa, and Illinois.

<https://www.fws.gov/species/poweshiek-skipperling-oarisma-poweshiek/map>

Critical habitat for the species was designated on October 1, 2015 (USFWS 2015). The critical habitat designation comprises approximately 25,900 acres in 56 units in Iowa, Michigan, Minnesota, North Dakota, South Dakota and Wisconsin. In Iowa, 11 critical habitat units are designated. The primary constituent elements specific to the Poweshiek skipperling critical

habitat designation are: (Element 1) Wet-mesic to dry tallgrass remnant untilled prairies or remnant moist meadows containing: a. A predominance of native grasses and native flowering forbs; b. Undisturbed (untilled) glacial soil types including, but not limited to, loam, sandy loam, loamy sand, gravel, organic soils (peat), or marl that provide the edaphic features conducive to Poweshiek skipperling larval survival and native prairie vegetation; c. If present, depressional wetlands or low wet areas, within or adjacent to prairies that provide shelter from high summer temperatures and fire; d. If present, trees or large shrub cover less than 5 percent of area in dry prairies and less than 25 percent in wet- mesic prairies and prairie fens; and e. If present, nonnative invasive plant species occurring in less than 5 percent of the area. (Element 2) Prairie fen habitats containing: a. A predominance of native grasses and native flowering forbs; b. Undisturbed (untilled) glacial soil types including, but not limited to, organic soils (peat), or marl that provide the edaphic features conducive to Poweshiek skipperling larval survival and native prairie vegetation; c. Depressional wetlands or low wet areas, within or adjacent to prairies that provide shelter from high summer temperatures and fire; d. Hydraulic features necessary to maintain prairie fen groundwater flow and prairie fen plant communities; e. If present, trees or large shrub cover less than 25 percent of the unit; and f. If present, nonnative invasive plant species occurring in less than 5 percent of area. (Element 3) Native grasses and native flowering forbs for larval and adult food and shelter, specifically; a. At least one of the following native grasses available to provide larval food and shelter sources during Poweshiek skipperling larval stages: Prairie dropseed (*Sporobolus heterolepis*), little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), or mat muhly (*Muhlenbergia richardsonis*); and b. At least one of the following forbs in bloom to provide nectar and water sources during the Poweshiek skipperling flight period: Purple coneflower (*Echinacea angustifolia*), black-eyed Susan (*Rudbeckia hirta*), smooth ox-eye (*Heliopsis helianthoides*), stiff tickseed (*Coreopsis palmata*), palespike lobelia (*Lobelia spicata*), sticky tofieldia (*Triantha glutinosa*), or shrubby cinquefoil (*Dasiphora fruticosa* ssp. *floribunda*). (Element 4) Dispersal grassland habitat that is within 1 km (0.6 mi) of native high- quality remnant prairie (as defined in Primary Constituent Element 1) that connects high quality wet-mesic to dry tallgrass prairies, moist meadows, or prairie fen habitats. Dispersal grassland habitat consists of the following physical characteristics appropriate for supporting Poweshiek skipperling dispersal: Undeveloped open areas dominated by perennial grassland with limited or no barriers to dispersal including tree or shrub cover less than 25 percent of the area and no row crops such as corn, beans, potatoes, or sunflowers.

Note that critical habitat for extirpated species retains its legal designation under the ESA and that the primary constituent elements may still be impacted by covered activities, and that potential reintroduction warrants continued protection of these areas.

For more information on CH for the poweshiek skipperling, see;

<https://www.fws.gov/species-publication-action/designation-critical-habitat-dakota-skipper-and-poweshiek-skipperling-1>.

<https://ecos.fws.gov/ecp/species/9161#crithab>

4.8 Crustaceans

4.8.1 Illinois Cave Amphipod (*Gammarus acherondytes*)

4.8.1.1 Species Summary

The Illinois cave amphipod is currently listed by the USFWS under the ESA as ‘endangered’ (USFWS 1998). Habitat loss and degradation of groundwater quality, resulting from urbanization and land use practices, as well as an influx of human and animal waste, are the principal threats to the species. The USFWS species profile for the Illinois cave amphipod can be found at <https://www.fws.gov/species/illinois-cave-amphipod-gammarus-acherondytes>. A summary of the ecology of this species can be found in the USFWS Recovery Plan (USFWS 2002) and the most recent five-year review (USFWS 2025).

4.8.1.2 Biological Information

The Illinois cave amphipod is a *troglobitic*, meaning cave dependent, species that inhabits the dark zone of cave streams (USFWS 2002). Little is known of the biology and specific habitat requirements of this species, although it has been collected in mainstream gravel riffles, smaller tributary streams, rimstone pools and from streams that overly bedrock.

4.8.1.3 Distribution & Critical Habitat Designation

This species is endemic to the Illinois Sinkhole Plain, which covers an area that is approximately 89 square miles (230 square kilometers) in Monroe and St. Clair counties in southwestern Illinois (USFWS 1998). Historically, the Illinois cave amphipod was known from six cave systems. However, since the time of listing, there have been several additional caves and groundwater basins that have been added to the species range. Currently the species is considered present in seven caves, extirpated from one and has an unknown status in eight (USFWS 2025).

<https://www.fws.gov/species/illinois-cave-amphipod-gammarus-acherondytes/map>

No critical habitat has been designated for this species.

4.9 Plants

4.9.1 Decurrent False Aster (*Boltonia decurrens*)

4.9.1.1 Species Summary

The decurrent false aster is currently listed by USFWS under the ESA as ‘threatened’ across its range (USFWS 1988). The main threats to the species continue to be those that were identified in the Recovery Plan (USFWS 1990). They consist of the destruction or conversion of habitat to cropland, prolonged, late season flooding, herbicide use, and loss of habitat due to encroachment by woody vegetation. The USFWS species profile for the decurrent false aster can be found at <https://ecos.fws.gov/ecp/species/7705>. Additional information can be found at <https://www.fws.gov/species/claspingleaf-dolls-daisy-boltonia-decurrens>. A summary of the ecology of this species can be found in the USFWS decurrent false aster recovery plan (USFWS 1990) and the most recent 5-year review (USFWS 2026).

4.9.1.2 Biological Information

Decurrent false aster is found in moist, sandy floodplains and prairie wetlands along the Illinois and Mississippi River (USFWS 1990). Although not very tolerant to prolonged flooding, this plant relies on periodic flooding to scour away other plants that compete for the same habitat. It is considered a perennial plant but also exhibits annual and biennial lifecycles. The species flowers in late summer and produces achenes (fruit with a single seed) in the fall which can disperse during flood events (USFWS 1990). The plant is also capable of vegetative reproduction via shoots from a basal rosette (Smith and Keevin 1998).

4.9.1.3 Distribution & Critical Habitat Designation

The species historical and current range includes Illinois and Missouri. In Illinois, the decurrent false aster continues to occur throughout most of its known range, which includes the Peoria, LaGrange, and Alton Pools of the Illinois River, as well as some areas along the Mississippi River immediately south of the confluence of the Illinois and Mississippi Rivers (USFWS 2026). The species was recently documented near East Cape Girardeau, Illinois within the floodplain of the Mississippi River.

<https://www.fws.gov/species/claspingleaf-dolls-daisy-boltonia-decurrrens/map>

No critical habitat has been designated for this species.

4.9.2 Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)

4.9.2.1 Species Summary

The eastern prairie fringed orchid (EPFO) is currently listed by USFWS under the ESA as ‘threatened’ across its range (USFWS 1989). Habitat loss and fragmentation of wetlands from development and vegetative succession (i.e., invasion of woody species) are the most prevalent threats (USFWS 1999). Other threats include competition from non-native, invasive plant species and collection for commercial and scientific purposes. The USFWS species profile for the EPFO can be found at <https://ecos.fws.gov/ecp/species/601>. Additional information can be found at <https://www.fws.gov/species/eastern-prairie-fringed-orchid-platanthera-leucophaea>. A summary of the ecology of this species can be found in the USFWS EPFO recovery plan (USFWS 1999) and the most recent 5-year review (USFWS 2020).

4.9.2.2 Biological Information

The eastern prairie fringed orchid occurs in a wide variety of habitats, from wet to mesic prairie, to wetland communities, including sedge meadow, fen, marsh and marsh edge (USFWS 1999). It can occupy a very wide moisture gradient of prairie and wetland vegetation. In general, the habitat is moist or moderately moist. The orchid requires full sun for optimal growth and flowering, which ideally would restrict it to grass, and sedge dominated plant communities. However, in some plant communities where there are encroaching species such as cattail and/or dogwood, the orchid may be interspersed or within the edge zones of these communities and thus can sometimes occur in partially shaded areas. The substrate of the sites where this orchid occurs include glacial soils, lake plain deposits, muck or peat, which could range from neutral to mildly calcareous. In some cases, the species may also occur along ditches or roadways where this type of habitat is present. Flowering begins from late June to early July and seed capsules mature over

the growing season and are dispersed by the wind from late August through September (USFWS 1999).

4.9.2.3 Distribution & Critical Habitat Designation

The EPFO was historically found in wide range from eastern Iowa, Missouri, and Oklahoma across southern Wisconsin, northern and central Illinois, southern Michigan, northern Indiana and Ohio, and northwestern Pennsylvania to western New York and southern Ontario (USFWS 1999). As of 2019, there are populations of eastern prairie fringed orchid in Illinois, Indiana, Iowa, Maine, Michigan, Missouri, Ohio, Virginia, and Wisconsin (USFWS 1999, 2020). In Illinois, the eastern prairie-fringed orchid is found in mesic areas of upland prairies, in bottomland prairies, and in prairie fens in several counties. In Iowa, the species is known from a few counties.

<https://www.fws.gov/species/eastern-prairie-fringed-orchid-platanthera-leucophaea/map>

No critical habitat has been designated for this species.

4.9.3 Lakeside Daisy (*Hymenoxys herbacea*)

4.9.3.1 Species Summary

The lakeside daisy is currently listed by USFWS under the ESA as ‘threatened’ across its range (USFWS 1988). Threats to this species include loss of alvar habitat, which is the only habitat that supports the species, loss of genetic diversity resulting in unviable seed, shading and competition from other plants, as well as herbivory of small populations. Additional information can be found at <https://www.fws.gov/species/lakeside-daisy-hymenoxys-herbacea>. A summary of the ecology of this species can be found in the species recovery plan (USFWS 1990) and the most recent 5-year review (USFWS 2021).

4.9.3.2 Biological Information

Lakeside daisy is a long-lived perennial that thrives in alvar habitat, which includes sparsely vegetated rock barrens with shallow soils (USFWS 1990, 2021). With its bright yellow flowers, lakeside daisy grows where few others can, on rocky alvar and modified alvar habitat, as well as on nearly barren limestone bedrock in full sunlight. In this harsh environment, where competition is reduced as a limited number of species will thrive in this habitat. Lakeside daisy flowers from late April to early June (USFWS 1990). A variety of insects pollinate the flowers including various species of bees and flies.

4.9.3.3 Distribution & Critical Habitat

Lakeside daisy is a Great Lakes endemic plant species, meaning it is restricted to the Great Lakes region. In the United States it is known from northern Ohio, northern Illinois and a few isolated populations in Michigan's Upper Peninsula (USFWS 2021). When Lakeside daisy was listed as endangered, only one fragmented population was known in the U.S., on the Marblehead Peninsula in Ottawa County, Ohio (USFWS 1988). The Lakeside daisy had also been recorded in Will and Tazewell Counties in Illinois but was presumed extirpated prior to listing. Since the time of listing, populations have been discovered in Michigan and introductions have occurred in

Illinois, Michigan, and Ohio (USFWS 2021). Restored populations in Illinois include three sites where Lakeside daisy was re-established in counties where the species had been previously recorded. These include two sites in Will County (Lockport Prairie Nature Preserve and Romeoville Prairie Nature Preserve) and one site in Tazewell County (Manito Nature Preserve). Introduced populations, in which populations are brought into counties where the species had not been documented as naturally occurring, are located in Cook and DuPage Counties in Illinois. A few plants were rescued from the original Tazewell County, Illinois population and moved to the Morton Arboretum in Illinois, where clones of individuals were established for scientific purposes (USFWS 1990).

<https://www.fws.gov/species/lakeside-daisy-hymenoxys-herbacea/map>

No critical habitat has been designated for this species.

4.9.4 Leafy Prairie Clover (*Dalea foliosa*)

4.9.4.1 Species Summary

The leafy prairie clover is currently listed by USFWS under the ESA as ‘endangered’ across its range (USFWS 1991). Threats of habitat destruction and degradation continue to affect populations throughout the species’ range to varying degrees, as do threats from herbivory and risk from more severe drought conditions. The USFWS species profile for leafy prairie clover can be found at <https://ecos.fws.gov/ecp/species/5498>. Additional information can be found at <https://www.fws.gov/species/leafy-prairie-clover-dalea-foliosa>. A summary of the ecology of this species can be found in the species recovery plan (USFWS 1996) and the most recent 5-year review (USFWS 2022).

4.9.4.2 Biological Information

Leafy prairie-clover is found only in open limestone cedar glades, limestone barrens, and dolomite prairies which have shallow, silt to silty clay loam soils over flat and often highly fractured, horizontally bedded limestone or dolomite with frequent expanses of exposed bedrock (USFWS 1996). In Illinois, the species is found exclusively in mesic to wet-mesic dolomite prairie. Flowering begins in late July, peaks in mid-August, and can continue until late August (USFWS 1996).

4.9.4.3 Distribution & Critical Habitat

The species historical range included Alabama, Illinois, Tennessee. Currently the species occurs within 63 populations, 50 located in central Tennessee, 11 disjunct populations in northeast Illinois, and 2 in northwest Alabama (USFWS 2022). Illinois supports 11 populations of which two are considered highly viable, five are moderately viable, and four are of low viability. The current range in Illinois includes Cook, DuPage, and Will Counties.

<https://www.fws.gov/species/leafy-prairie-clover-dalea-foliosa/map>

No critical habitat has been designated for this species.

4.9.5 Mead’s Milkweed (*Asclepias meadii*)

4.9.5.1 Species Summary

Mead's milkweed is currently listed by the USFWS under the ESA as 'threatened' across its range (USFWS 1988). Threats to Mead's milkweed habitat include urbanization, land conversion to agriculture, habitat fragmentation, lack of prescribed fire, habitat destruction from feral hogs, and pesticide application, which affects both the plant itself and its pollinators (USFWS 2022). The USFWS species profile for Mead's milkweed can be found at <https://ecos.fws.gov/ecp/species/8204>. Additional information can be found at <https://www.fws.gov/species/meads-milkweed-asclepias-meadii>. A summary of the ecology of this species can be found in the USFWS Mead's milkweed recovery plan (USFWS 2003) and most recent 5-year review (USFWS 2022).

4.9.5.2 Biological Information

Mead's milkweed primarily occurs in in mesic to dry mesic areas and the habitat is characterized by drought and fire adapted vegetation such tallgrass prairie, but can also occur in hay meadows, and in thin soil glades or barrens (USFWS 2022). These plants prefer full sun, such as in prairie, but can also be found in partial shade, such as in glades or barrens. The flowers bloom between May and June, depending on location within the range (USFWS 2003). Mead's milkweed grows slowly and rarely reproduces, so it may take decades for any introduced populations to be viable (USFWS 2012).

4.9.5.3 Distribution & Critical Habitat Designation

Historically, Mead's milkweed occurred throughout the eastern tallgrass prairie region of the central United States, which included Kansas, Missouri, Illinois, southern Iowa, southwest Wisconsin, and northwest Indiana (USFWS 2003). It currently is known from 171 sites in 34 counties in eastern Kansas, Missouri, south-central Iowa, and southern Illinois. In southern Illinois, mead's milkweed is known primarily from sandstone barrens in Johnson and Saline Counties (USFWS 2022). In northern Illinois, mead's milkweed is known from specific prairie remnants in Hancock, Henry, and Vermilion Counties. In Iowa, mead's milkweed is known from dry-mesic to mesic prairie remnants in a few counties.

<https://www.fws.gov/species/meads-milkweed-asclepias-meadii/map>

No critical habitat has been designated for this species.

4.9.6 Northern Wild Monkshood (*Aconitum noveboracense*)

4.9.6.1 Species Summary

Northern wild monkshood is currently listed by the USFWS under the ESA as 'threatened' across its range (USFWS 1978). Threats to northern monkshood are predominately related to habitat loss or degradation. Possible threats include contamination and filling of sinkholes, grazing and trampling by livestock and deer, human foot traffic, logging, maintenance of highways and powerlines, misapplication of pesticides, quarrying and road building. The USFWS species profile for northern wild monkshood can be found at <https://ecos.fws.gov/ecp/species/1450>. Additional information can be found at <https://www.fws.gov/species/northern-wild-monkshood-aconitum-noveboracense>. A summary of the ecology of this species can be found in the USFWS species recovery plan (USFWS 1983).

4.9.6.2 Biological Information

Northern monkshood is a perennial and reproduces from both seed and small tubers. The flowers bloom between June and September, depending on location within the range (USFWS 1983). The species is typically found on shaded to partially shaded cliffs, algific talus slopes, or on cool, streamside sites (USFWS 1983). These areas have cool soil conditions, cold air drainage or cold groundwater flowage. On algific talus slopes, these conditions are caused by the outflow of cool air and water from ice contained in underground fissures. These fissures are connected to sinkholes and are a conduit for the air flows.

4.9.6.3 Distribution & Critical Habitat

Northern monkshood has only been found in northeastern Iowa, southwestern Wisconsin, northeastern Ohio and the Catskill Mountains area of New York. The species is found in several Iowa counties.

<https://www.fws.gov/species/northern-wild-monkshood-aconitum-noveboracense/map>

No critical habitat has been designated for this species.

4.9.7 Pitcher's Thistle (*Cirsium pitcheri*)

4.9.7.1 Species Summary

Pitcher's thistle is currently listed by the USFWS under the ESA as 'threatened' across its range (USFWS 1988). Threats to species are shoreline development, dune stabilization, recreation, and invasive non-native plants and animals, including seed-eating weevils (USFWS 2002, 2018). The USFWS species profile can be found at <https://ecos.fws.gov/ecp/species/8153>. Additional information can be found at <https://www.fws.gov/species/pitchers-thistle-cirsium-pitcheri>. A summary of the ecology of this species can be found in the USFWS species recovery plan (USFWS 2002) and the most recent 5-year review (USFWS 2023).

4.9.7.2 Biological Information

The Pitcher's thistle is a native thistle that grows on the open sand dunes and low open beach ridges along the shorelines of Lakes Michigan, Superior, and Huron (USFWS 2002). It is most often found in near-shore plant communities, but it can grow in all non-forested areas of a dune system.

4.9.7.3 Distribution & Critical Habitat

Historically the pitcher's thistle was distributed along the shorelines of the Great Lakes in both the United States and Canada (USFWS 2002). It is currently found in Indiana, Michigan, and Wisconsin and in Ontario Canada. Pitcher's thistle was extirpated from Illinois but has been reintroduced in Lake County.

<https://www.fws.gov/species/pitchers-thistle-cirsium-pitcheri/map>

No critical habitat has been designated for this species.

4.9.8 Prairie Bush-clover (*Lespedeza leptostachya*)

4.9.8.1 Species Summary

Prairie bush-clover is currently listed by the USFWS under the ESA as ‘threatened’ across its range (USFWS 1987). Main threats to the species include the conversion of remnant prairie to cropland or developed sites, spread of non-native invasive plant species, the encroachment of dominant vegetation, prolonged drought, and hybridization (USFWS 2021). The USFWS species profile can be found at <https://ecos.fws.gov/ecp/species/4458>. Additional information can be found at <https://www.fws.gov/species/prairie-lespedeza-lespedeza-leptostachya>. A summary of the ecology of this species can be found in the USFWS prairie bush-clover recovery plan (USFWS 1988) and the most recent 5-year review (USFWS 2021).

4.9.8.2 Biological Information

Prairie bush-clover is a long-lived species found on disturbed tallgrass prairie habitats that have been previously mowed, burned, cultivated, or grazed, in addition to undisturbed remnant prairie sites (USFWS 1988). The species is adapted to a diverse assortment of prairie soil conditions and can occur at a variety of prairie types including dry, dry-mesic, mesic, or bedrock prairies (USFWS 2021).

4.9.8.3 Distribution & Critical Habitat

The species historical and current range both include Illinois, Iowa, Minnesota, and Wisconsin.

<https://www.fws.gov/species/prairie-lespedeza-lespedeza-leptostachya/map>

No critical habitat has been designated for this species.

4.9.9 Price’s Potato-Bean (*Apios priceana*)

4.9.9.1 Species Summary

Price’s potato-bean is currently listed by the USFWS under the ESA as ‘threatened’ across its range (USFWS 1990). Threats to the species include excessive shading by canopy trees and competing ground cover, right-of-way maintenance for roads and utilities, competition with exotic, invasive plants, and insect herbivory (USFWS 2022). The USFWS species profile for Short’s bladderpod can be found at <https://ecos.fws.gov/ecp/species/7422>. Additional information can be found at <https://www.fws.gov/species/travelers-delight-apios-priceana>. A summary of the ecology of this species can be found in the USFWS species recovery plan (USFWS 1993) and the most recent 5-year review (USFWS 2022).

4.9.9.2 Biological Information

Price’s potato-bean is found in open forests, along forest edges, and along the edges of creeks and rivers. The species seems to prefer mesic areas and is often found in open, low areas near a stream or along the banks of streams and rivers (USFWS 1993).

4.9.9.3 Distribution & Critical Habitat

The species historical range included Alabama, Illinois, Kentucky, Mississippi, and Tennessee; however, the species is now considered extirpated from Illinois. This species is not known to

occur in Illinois or Iowa but may show up on the species list for Illinois due to overlap between the species range and the Illinois state boundary.

<https://www.fws.gov/species/travelers-delight-apos-priceana/map>

No critical habitat has been designated for this species.

4.9.10 Short's Bladderpod (*Physaria globosa*)

4.9.10.1 Species Summary

Short's bladderpod is currently listed by the USFWS under the ESA as 'endangered' across its range (USFWS 2014a). Threats to Short's bladderpod include competition from invasive plant species; prolonged inundation and soil erosion from extreme precipitation, flooding, and water level manipulation; habitat loss and degradation from construction and right-of-way maintenance; and canopy shading due to forest succession (USFWS 2020). The USFWS species profile for Short's bladderpod can be found at <https://ecos.fws.gov/ecp/species/7206>. Additional information can be found at <https://www.fws.gov/species/globe-bladderpod-physaria-globosa>. A summary of the ecology of this species can be found in the USFWS species recovery plan (USFWS 2021a), the species status assessment (USFWS 2020) and the most recent 5-year review (USFWS 2021b).

4.9.10.2 Biological Information

Short's bladderpod typically grows on steep, rocky, wooded slopes and talus slopes and along tops, bases, and ledges of bluffs – often near rivers or streams – and on south to west-facing slopes (USFWS 2020).

4.9.10.3 Distribution & Critical Habitat Designation

Short's bladderpod was historically distributed throughout Kentucky and Tennessee and in one county in southern Indiana. This species is not known to occur in Illinois or Iowa but may show up on the species list for Illinois due to overlap between the species range and the Illinois state boundary.

Critical habitat has been designated for this species; however, there is no critical habitat is designated in Iowa or Illinois for the species (USFWS 2014b).

<https://www.fws.gov/species-publication-action/designation-critical-habitat-physaria-globosa-shorts-bladderpod-1>

<https://www.fws.gov/species/globe-bladderpod-physaria-globosa/map>

4.9.11 Western Prairie Fringed Orchid (*Platanthera praeclara*)

4.9.11.1 Species Summary

Western prairie fringed orchid is currently listed by the USFWS under the ESA as 'threatened' across its range (USFWS 1989). Main threats to the species include the conversion of remnant prairie to cropland, incompatible use of herbicides and pesticides, siltation, changes in hydrology, fire suppression, encroaching woody vegetation, and the spread of non-native, invasive plant species. Heavy grazing and early haying may also have detrimental impacts on

populations (USFWS 2021). The USFWS species profile for western prairie fringed orchid can be found at <https://ecos.fws.gov/ecp/species/1669>. Additional information can be found at <https://www.fws.gov/species/western-prairie-fringed-orchid-platanthera-praeclara>. A summary of the ecology of this species can be found in the USFWS western prairie fringed orchid recovery plan (USFWS 1996) and the most recent 5-year review (USFWS 2021).

4.9.11.2 Biological Information

The Western prairie fringed orchid is a perennial orchid of the North American tall grass prairie and is found most often on unplowed, calcareous prairies and sedge meadows. Soil moisture is a critical determinant of growth, flowering, and distribution of western prairie fringed orchid (USFWS 2009). This species is dependent on mycorrhizal fungi, especially for seed germination and for nutritional support before plants are capable of photosynthesis. The persistence of western prairie fringed orchid is dependent on periodic disturbance by fire, mowing, or grazing, but these practices may also cause adverse effects and must be carefully implemented. Although Western prairie fringed orchid forms tubers and vegetative shoots from existing plants, pollination is required for seed production. Western prairie fringed orchid is pollinated by a few species of sphinx moths (USFWS 2009). Seeds are wind-dispersed and may also be adapted for dissemination through the soil profile by water.

4.9.11.3 Distribution & Critical Habitat Designation

The Western prairie fringed orchid occurs in moist tallgrass prairies Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and Manitoba, Canada. and Oklahoma. The species appears to be extirpated from Oklahoma and South Dakota. The western prairie-fringed orchid is known from several counties in Iowa.

<https://www.fws.gov/species/western-prairie-fringed-orchid-platanthera-praeclara/map>

No critical habitat has been designated for this species.

5 Effects of Covered Activities

This section covers the effects of the anticipated activities covered in this standing analysis to the covered species and critical habitat (above). Where appropriate in our analysis, we make note of which activities are expected to have no effect on a species and critical habitat. This information is provided as helpful technical assistance to those agencies and project proponents who may be unfamiliar with the species and activities and can be incorporated by reference by action agencies when they make a NE determination.

The effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02).

A project's action area must include all areas affected (i.e., modifications to land, air, or water) by the proposed action, and not merely the immediate area involved in the action. If the activities satisfy the two-part test for causation ("but for" and "reasonably certain to occur"), they should be considered as part of the action. To qualify for use of this standing analysis, a project's action area must be wholly encompassed by the coverage area for this standing analysis as described above and all activities within the proposed action must fit within the scope of the standing analysis.

Qualifying actions typically involve one or more of the stressors addressed below.

5.1 Effects Analysis for Qualifying Questions

Communications Towers

Communication towers pose a risk to migratory birds because of potential for collision and acting as a hazardous attractant to birds in-flight or nesting birds. Birds may collide with the tower or support structures, especially guy wires. Tower lighting, particularly steady-burning lights, can create a hazardous attractant, drawing birds towards towers and increasing the risk of collision. Attracted birds may aggregate and circle the tower, ultimately colliding with the tower, guy wires, or other birds. Birds circling towers may also fall to the ground from exhaustion and be hit by vehicles or succumb to other stressors and threats, such as predation by other animals. Birds also nest on tower structures and surrounding vegetation and infrastructure. These nests may be disturbed or destroyed as part of operation and maintenance activities. Research has determined that the risk to birds increases when towers are lit with steady-burning lights at night, supported by guy wires, taller than 450 feet, located in areas with high densities of migrating birds flying nearby, and located along ridgelines, which brings migrating birds closer to tall towers. Proper lighting, design, and location can reduce the effects of communications towers to insignificant levels.

<https://www.fws.gov/story/avoidance-and-minimization-measures-communication-towers>

Overhead Transmission and Utility Lines

Bird mortalities resulting from electric utility lines have been a long-standing bird conservation issue for many species. Power line infrastructure kills millions of birds every year. Birds can be injured or killed from collisions with both distribution and transmission power lines in mid-flight. Distribution lines are a particular risk in locations frequently traveled by birds (such as bird concentration areas) and in areas where poor weather or darkness could further decrease visibility. Birds can be electrocuted when flying on or off a distribution pole or when a large number of birds roost on lines at the same time, causing them to sway and make connections. Birds nesting on power line towers and poles have a greater risk of electrocutions and collisions, because nesting birds will have more flights close to power lines. Nesting material may also cause an electrical connection, or the nest material could catch on fire, killing the bird and damaging the power line structure. Avian protection plans include conservation measures that reduce the effects of power lines on birds to insignificant levels.

<https://www.fws.gov/story/avoidance-and-minimization-measures-power-lines>

5.2 Effects Analysis for Mammals

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation/fragmentation
- Exposure Risk/Disturbance

5.2.1 Gray bat (*Myotis grisescens*)

Habitat Loss/Degradation

Gray bats are considered cave-obligate species, migrating seasonally between hibernating and maternity caves and will also use non-cave summer roost sites, such as dams, mines, quarries, concrete box culverts and crevices under bridges (USFWS 1982, 2009, 2025). Gray bats often forage over open water of rivers, streams, lakes, or reservoirs. Alteration or impacts to habitats occupied by the species could significantly impact the breeding, rearing, feeding, and roosting/hibernating habits of the species.

To avoid potential impacts to known hibernacula and maternity sites, all projects occurring within the primary buffer of a hibernacula or maternity colony site will receive a may affect determination. In addition, mineral extraction (e.g. mine/quarry), exploration, or projects that involve drilling or blasting into bedrock within the secondary buffer and could cause damage to maternity colony and hibernation habitat for the species will receive a may affect determination. Project activities that occur outside of the primary and secondary buffer of a known hibernacula or maternity colony site are likely to have no effect or insignificant effects on habitat for the species. Also, activities that avoid alteration of or avoid impacts to known or potential hibernacula habitat (caves or associated sinkholes, fissures, or other karst features) and potential maternity colony habitat (caves, dams, mines, quarries, or other suitable cave-like structures) are likely to have no effect, insignificant, or discountable effects on habitat for the species.

Exposure Risk/Disturbance

Projects and activities occurring outside the tertiary buffer of a known gray bat hibernacula or maternity colony site are likely to have no effect, insignificant, or discountable effects to the species. In addition, most project activities occurring outside the active season (April 1-November 15) are likely to have no effect or insignificant effects to the species. Specific activities addressed in this dkey that may affect the species are described below along with avoidance and minimization measures.

Blasting and Drilling

Blasting and drilling could cause disturbance to hibernating or summer maternity colonies of gray bats due to noise and vibration. Mineral extraction (e.g. mine/quarry), exploration, or projects that involve drilling or blasting into bedrock within the secondary buffer will receive a may affect determination. Blasting and drilling activities that occur outside of the secondary buffer of a known hibernacula or maternity colony site are likely to have no effect or insignificant effects to the species.

Bridge and Culverts

Gray bats have been found using concrete box culverts and crevices under bridges (USFWS 2025). Activities involving bridge maintenance, replacement, or removal could cause disturbance to roosting bats and could result in injury or death. Projects without a bridge or culvert assessment, an assessment over two years old, or where the species is found to be present will receive a may affect determination. Projects that avoid impacts to bridges or where the assessment does not detect the presence of any bats or gray bats specifically are likely to have no effect, insignificant, or discountable effects to the species.

Prescribed Fire

Prescribed fire could affect hibernating or summer maternity colonies of gray bats if they generate smoke or gases that drift or are blown into hibernacula or maternity colony sites. Smoke from prescribed fire may not reach toxic levels in caves and mines, but introduced gases could arouse bats from hibernation, causing energy expenditure and could cause disturbance to maternity colonies. Fire could also alter vegetation surrounding the entrances to caves and mines, which could indirectly affect temperature and humidity regimes by modifying airflow. To avoid impacts to hibernacula and maternity colony sites, all project activities including prescribed fire within the primary buffer of known gray bat site will result in a may affect determination. Prescribed fires conducted outside of the primary and secondary buffers of known gray bat hibernacula and maternity colony sites are likely to have no effect or insignificant effects. Prescribed fires conducted within the secondary buffer and under conditions that will reduce or eliminate smoke and gases from dispersing into known gray bat sites are also likely to have insignificant effects.

Herbicide and Pesticides

Gray bats may be exposed to herbicide or pesticides if applied in suitable summer habitats or if applied in conditions which would cause drift of contaminants into suitable summer habitat during the active season (USFWS 1982, 2009). In addition, herbicide and pesticide application may contaminate surface water sources utilized for drinking and impact aquatic insect prey resources of the gray bat. Large-scale or aerial insecticide spraying are more likely to result in direct application or drift of contaminants into suitable summer habitat and/or impact surface water sources. Targeted application methods like hack-and-squirt, basal bark, injections, cut-stump, or spot-spraying (foliar spraying on individual herbaceous plants with no foliar spraying of tree leaves) are likely to have no effect or insignificant effects to listed bat species and their prey resources. In addition, application of herbicides and pesticides during the inactive season, outside of suitable summer habitat, or that are conducted in a manner to avoid the drift into areas of suitable summer habitat are likely to have insignificant or discountable effects. We expect the effects on aquatic insect prey resources will be temporary and insignificant due to the scale of qualifying projects and the temporary nature of this activity.

5.2.2 Indiana bat (*Myotis sodalis*)

Habitat Loss/Degradation/Fragmentation

In Illinois and Iowa, Indiana bats spend the winter timeframe (November 16 to March 31) in hibernacula in caves and other cave-like locations (e.g., abandoned mines) and the fall swarming

period near hibernacula occurs from August 16 to November 15 (USFWS 2007, 2026). During the summer occupancy (April 1 to September 30) timeframe, reproductive females will form maternity colonies in suitable summer habitat. Alteration or impacts to habitats occupied by the species could significantly impact the breeding, rearing, feeding, and roosting/hibernating habits of the species.

Hibernacula Habitat

To avoid potential impacts to known hibernacula, all projects occurring within the primary buffer of an Indiana bat hibernacula will receive a may affect determination and any projects that will impact potential hibernacula habitat will also receive a may affect determination (USFWS 2019). In addition, mineral extraction (e.g. mine/quarry), exploration, or projects that involve drilling or blasting into bedrock within the secondary buffer and could cause damage to hibernacula habitat will receive a may affect determination. Project activities that occur outside of the primary and secondary buffer of a known hibernacula are likely to have no effect or insignificant effects on hibernating and spring staging/fall swarming habitat for the species. Also, activities that avoid alteration of or avoid impacts to potential hibernacula habitat (caves or associated sinkholes, fissures, and other karst features, mines, rocky outcroppings, or tunnels) are likely to have no effect or insignificant effects on hibernating habitat for the species.

Summer Habitat

Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats and includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 5 inches dbh that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors (USFWS 2026). To avoid potential impacts to maternity colony habitat of the species and to reduce the effects of forest fragmentation on bat travel corridors and foraging habitat, all projects involving the clearing or conversion of suitable habitat greater than 10 acres will receive a may affect determination. Projects that include more than 10 acres of tree clearing can still reach a NLAA determination but would require further coordination with the Service to fully evaluate the potential effects of the proposed project. Based on years of previous consultations, projects that involve the clearing or conversion of less than 10 acres are not likely to degrade the quality of roosting and foraging habitat or render travel corridors unsuitable and the impacts are expected to be insignificant when the clearing or conversion occurs during the inactive season. In addition, Projects that avoid or minimize impacts to suitable habitat or where species surveys indicate probable absence of Indiana bat are likely to have no effect or insignificant or discountable effects on the species.

Exposure Risk/Disturbance

Projects and activities occurring outside the secondary buffer of a known Indiana bat hibernacula are likely to have no effect, insignificant, or discountable effects to hibernating Indiana bats. In addition, most project activities occurring outside the active season (April 1 – September 30 or April 1-November 15 if near a hibernacula) are likely to have no effect or insignificant effects to the species. Specific activities addressed in this DKey that may affect the species are described below along with avoidance and minimization measures.

Tree Removal

Indiana bat potential roosts include live trees and/or snags ≥ 5 inches dbh that have exfoliating bark, cracks, crevices, and/or hollows. Removing an occupied roost tree may injure or kill an adult and flightless young that may not be able to safely exit the roost (USFWS 2007). In addition, removing an occupied roost may increase the risk of day-time predation and cause roost abandonment. To avoid direct effects to Indiana bats while they are roosting in trees, suitable roost trees will only be removed during the timeframe when the species is not likely to be present unless site-specific information (e.g., survey) demonstrates probable absence. Projects that avoid impacts to potential roost trees, occur outside the active season (April 1 – September 30 or April 1-November 15 if near a hibernacula), or where species surveys indicate probable absence of Indiana bat are likely to have no effect, insignificant, or discountable effects to the species.

Blasting and Drilling

Blasting and drilling could cause disturbance to hibernating Indiana bats due to noise and vibration and cause physical alterations (USFWS 2007). Mineral extraction (e.g. mine/quarry), exploration, or projects that involve drilling or blasting into bedrock within a secondary buffer of a known hibernacula will receive a may affect determination. Blasting and drilling activities that occur outside of the secondary buffer of a known hibernacula are likely to have no effect or insignificant effects to hibernating Indiana bats. Exposure to chronic or intense night-time noise (above current levels of ambient noise in the area) and vibrations from blasting and drilling could also affect Indiana bat behavior and foraging success (ability to locate and capture prey) during the active season and are discussed in detail below in the noise and vibration section.

Bridge and Culverts

Indiana bats have been found using crevices under bridges (USFWS 2026). Activities involving bridge maintenance, replacement, or removal could cause disturbance to roosting bats and could result in injury or death. Projects without a bridge or culvert assessment, an assessment over two years old, or where the species is found to be present will receive a may affect determination. Projects that avoid impacts to bridges or where the assessment does not detect the presence of any bats or gray bats specifically are likely to have no effect, insignificant, or discountable effects to the species.

Herbicide and Pesticide Application

Indiana bats may be exposed to herbicide or pesticides if applied in suitable summer habitats or if applied in conditions which would cause drift of contaminants into suitable summer habitat during the active season. In addition, herbicide and pesticide application may contaminate surface water sources utilized for drinking and impact aquatic insect prey resources of the Indiana bat (USFWS 2007). Large-scale or aerial insecticide spraying are more likely to result in direct application or drift of contaminants into suitable summer habitat and/or impact surface water sources. Targeted application methods like hack-and-squirt, basal bark, injections, cut-stump, or spot-spraying (foliar spraying on individual herbaceous plants with no foliar spraying of tree leaves) are likely to have no effect or insignificant effects to listed bat species and their prey resources. In addition, application of herbicides and pesticides during the inactive season,

outside of suitable summer habitat, or that are conducted in a manner to avoid the drift into forested areas that are suitable habitat for the Indiana bat are likely to have insignificant or discountable effects. We expect the effects on aquatic insect prey resources will be temporary and insignificant due to the scale of qualifying projects and the temporary nature of this activity.

Noise and Vibration

Exposure to chronic or intense night-time noise (above current levels of ambient noise in the area) could affect Indiana bat behavior and foraging success (ability to locate and capture prey) during the active season (USFWS 2024). In addition, exposure could impact the use of and Indiana bat roosting success in affected areas especially during the pup season (May 15 – July 31). An individual's response to this stressor is dependent on the magnitude of the noise, the proximity of the individual to the source, and an individual's level of habituation to the stressor. Noise and vibration resulting from projects are typically produced temporarily during the construction phase (i.e., operation of construction equipment and vehicles) and may be permanently produced during the operation phase (e.g., increased vehicular traffic, commercial/recreational facilities, military operations, drilling, blasting, etc.). Minor noise and vibration (at or below current levels of ambient noise in the area) and noise and vibration occurring outside the active season (April 1 – September 30 or April 1-November 15 if near a hibernacula) are likely to have no effect or insignificant effects to listed bat species. In addition, noise and vibration occurring outside the pup season (May 15-July 31) will likely have insignificant effects to the Indiana bat. We have documented several Indiana bat maternity roosts in areas of chronic and intense night-time noise such as adjacent to roadways, airports, firing ranges, and the species has been documented utilizing bridges for roosting. We believe that adult and juvenile Indiana bats capable of flying will be able to avoid or move away from areas affected by chronic or intense night-time noise, will disperse to other areas of suitable habitat, and the increase in noise and/or vibration will result in only insignificant effects. Increased noise and/or vibration during the Indiana bat pup season when juveniles are not capable of flying and are unable to avoid or move away from the stressor may result in adverse effects.

Night Lighting

Exposure to night-time lighting (above current levels) could affect Indiana bat behavior and foraging success (ability to locate and capture prey) during the active season (USFWS 2024). In addition, exposure could impact the use of and roosting success of Indiana bats in affected areas especially during the pup season (May 15 - July 31). An individual's response to this stressor is dependent on the magnitude of the stressor, the proximity of the individual to the source, and an individual's level of habituation to the stressor. Night lighting produced by some projects may occur temporarily during the construction phase (e.g., equipment lighting) and/or permanently during the operation phase (e.g., road/trail and facility lighting) and are often localized. Downward-facing lights with the same intensity or less for replacement lighting, lights directed away from suitable habitat, and nighttime lighting occurring outside the active season (April 1 – September 30 or April 1-November 15 if near a hibernacula) will likely have no effect or insignificant effects to listed bat species. In addition, nighttime lighting occurring outside the pup season (May 15-July 31) will likely have insignificant effects to the Indiana bat. We believe that

in most situations Indiana bats will be able to avoid or move away from areas affected by night-time lighting, will disperse to other areas of suitable habitat, and the increase in lighting will result in only insignificant effects.

Prescribed Fire

Prescribed fire during the active season may affect individual Indiana bats adversely through exposure to heat, smoke, and carbon monoxide, and positively/negatively through habitat modifications and resulting changes in their food base (USFWS 2024). Exposure to heat and smoke can cause harm from death or injury directly or from predation that could occur when individual bats flee prescribed burns. Non-volant pups and individuals in torpor during cold temperatures are likely the most vulnerable to death and injury from prescribed fire. Prescribed fire with high flame height/intensity are more likely to burn potential roosts quickly and result in exposure of individuals to heat, smoke, and carbon monoxide. Prescribed fires occurring outside of the active season (April 1 – September 30 or April 1-November 15 if near a hibernacula) are likely to have no effect or insignificant effects to listed bat species. Prescribe fire occurring during the active season but outside the non-volant pup season (May 15- July 31), taking place when the temperatures are above 40 degrees Fahrenheit, and applying a fire prescription with an average flame length of less than 8 feet are also likely to have insignificant or discountable effects to Indiana bats. Indiana bats flushing from trees during the day may be exposed to greater risk of predation; however, the presence of heat and smoke during prescribed burning is also likely to displace potential predators and thus is discountable under the conditions described above.

Fire can affect availability of roosting sites for Indiana bats (cavities, crevices, loose bark) by creating or consuming snags, which typically provide these features, or by creating these features in live trees. In addition to creating snags and live trees with roost features, prescribed fire may enhance the suitability of trees as roosts by reducing adjacent forest clutter. Although stand-replacing or other intense wildfires may create large areas of snags, the effects of multiple, low-intensity prescribed burns on snag density are less obvious, especially for forests consisting mostly of fire-adapted tree species. We expect the effects of prescribed fire on roost availability will be temporary and insignificant due to the scale and timing of qualifying projects. Prescribed fire may cause a temporary decrease or shift in insect abundance immediately following the fire; however, we expect the effects on insect prey resources will be temporary and insignificant due to the scale of qualifying projects and the temporary nature of this activity.

Prescribed fire conducted during the winter could affect hibernating Indiana bats if they generate smoke or gases that drift or are blown into hibernacula. Smoke from prescribed fire may not reach toxic levels in caves and mine, but introduced gases could arouse bats from hibernation, causing energy expenditure. Fire could also alter vegetation surrounding the entrances to caves and mines, which could indirectly affect temperature and humidity regimes of hibernacula by modifying airflow. To avoid impacts to hibernacula, all project activities including prescribed fire within the primary buffer of known Indiana bat hibernacula entrance will result in a may affect determination. Prescribed fires conducted outside of the primary and secondary Indiana bat hibernacula buffers are likely to have no effect or insignificant effects on hibernating Indiana

bats. Prescribed fires conducted within the secondary buffer and under conditions that will reduce or eliminate smoke and gases from dispersing into known Indiana bat hibernacula are also likely to have insignificant effects on hibernating Indiana bats.

5.2.3 Indiana bat (*Myotis sodalis*) Critical Habitat

Habitat Loss/Degradation/Fragmentation

Critical habitat has been designated for this species and includes one unit (hibernacula) in LaSalle County, Illinois (USFWS 1977). Project activities that alter the physical and biological features of critical habitat for the species could significantly impact the hibernating habits and survival of the species. To avoid potential impacts to the critical habitat, all projects occurring within the primary buffer of the designated hibernacula will receive a may affect determination. In addition, mineral extraction (e.g. mine/quarry), exploration, or projects that involve drilling or blasting into bedrock within the secondary buffer will receive a may affect determination. Projects that do not have a federal nexus or that occur outside of the primary and secondary buffer of the hibernacula are likely to have no effect or insignificant effects. In addition, projects which avoid or minimize impacts to the designated critical habitat and surrounding habitat will result in a no effect or not likely to adversely affect determination for critical habitat.

5.3 Effects Analysis for Birds

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation/fragmentation
- Disturbance
- Predation Risk

5.3.1 Piping Plover (*Charadrius melodus*)

Habitat Loss/Degradation

The Piping Plover is a migratory shorebird that utilizes the coast of Lake Michigan in Illinois for breeding, nesting, and stopover during migration (USFWS 2024). The species also utilizes the Missouri River in Iowa for breeding, nesting and stopover during migration and utilizes the shorelines of larger lakes in central Illinois for stopover during migration. Permanent alteration to piping plover habitat, especially alteration of the essential physical and biological features, could significantly impact the breeding, nesting, and foraging habits of these birds. Projects that result in minor habitat loss and/or temporary degradation of available habitat and take place outside of the breeding and nesting season (April 1-August 31) are likely to have insignificant or discountable effects to the species (USFWS 2003, 2015).

Disturbance/Predation

Any alterations that would cause an increase of disturbance (e.g. beach access structures, boardwalks, pavilions, roads, trails, marinas) or predation risk (e.g. avian predator perches and predator attractants) could diminish breeding and nesting success for piping plovers and decrease foraging success. Actions taking place during the breeding and nesting season of piping plovers

(April 1 through August 31) could decrease nesting, breeding, and foraging success due to increased construction noise and activity. Actions taking place outside of the nesting and breeding season (April 1-August 31) and migration windows (April 1-May 1 or August 15-September 15) and that limit disturbance are likely to have no effect or insignificant and discountable effects to the species (USFWS 2003, 2015).

5.3.2 Piping Plover (*Charadrius melodus*) Critical Habitat

Critical habitat is designated for the Great Lakes and Northern Great Plains breeding population of piping plover (USFWS 2001, 2002). In Illinois, one unit has been designated from Illinois Beach State Park to Waukegan Beach in Lake County. Projects that alter the essential physical and biological features could significantly impact the breeding, nesting, and foraging habits of these birds. Projects that do not have a federal nexus or will avoid alterations of piping plover breeding and nesting habitat quality, quantity, or availability are not likely to adversely modify critical habitat for the species and will result in a no effect determination for critical habitat.

5.3.3 Rufa Red Knot (*Calidris canutus rufa*)

Habitat Loss/Degradation

The rufa red knot is a migratory shorebird that utilizes the coasts of the Great Lakes and inland areas such as the Mississippi and Missouri River flyways as stopover areas during migration in Illinois and Iowa (USFWS 2023). Impacts to rufa red knot stopover habitat is not anticipated to result in adverse effects to the species. Most projects that qualify for use of this DKey will result in minor habitat loss and/or temporary degradation of available stopover habitat for this species and any reduction or modification of available stopover habitat will result in only insignificant effects to the species.

Disturbance

Actions taking place during the migratory window (May 1-September 30) of rufa red knots may impact foraging habits and/or activity of the species (USFWS 2020). Most projects that qualify for the use of this Dkey are unlikely to disturb the species (discountable) or any disturbance to the species will be insignificant.

5.3.4 Whooping Crane (*Grus americana*)

The Service has determined a non-essential population is not necessary for the continued existence of the species. For the purposes of consultation, non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park land (require consultation under 7(a)(2) of the ESA) and as a proposed species on private land (no section 7(a)(2) requirements, but Federal agencies must not jeopardize their existence (section 7(a)(4))).

Projects that do not have a federal nexus or that do not occur on a National Wildlife Refuge or National Park land are not likely to jeopardize the continued existence of the species and will receive a no effect or not likely to adversely affect determination for the species.

Habitat Loss/Degradation

The whooping crane is a migratory bird species that utilizes the Mississippi River flyway during migration (USFWS 2007). The species is known to utilize stopover sites in Illinois and Iowa and has been documented during the overwintering period in Illinois. Impacts to whooping crane stopover habitat is not anticipated to result in adverse effects to the species. Most projects that qualify for use of this DKey will result in minor habitat loss and/or temporary degradation of available stopover habitat for this species and any reduction or modification of available stopover habitat will result in only insignificant effects to the species. Permanent alteration of known overwintering habitat could impact their migratory success, especially if the action takes place during their migratory and overwintering window (November 1 – March 31) (USFWS 2007).

Disturbance

Actions taking place during the migratory window (November 1 – March 31) of whooping crane may impact foraging habits and/or activity of the species. Actions taking place outside the migratory window are not expected to impact the species. Most projects that qualify for the use of this Dkey are unlikely to disturb the species (discountable) or any disturbance to the species will be insignificant.

5.4 Effects Analysis for Reptiles

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation
- Exposure risk/disturbance

5.4.1 Alligator Snapping Turtle (*Macrochelys temminckii*)

Habitat Loss/Degradation

Alligator snapping turtles are generally found in deeper water of large rivers and their major tributaries; however, they are also found in a wide variety of habitats, including small streams, bayous, canals, swamps, lakes, reservoirs, ponds, oxbows, and utilized adjacent uplands for nesting (USFWS 2021a). Activities that would directly alter these habitats could impact the breeding, nesting, and feeding habits of the species if present. Increased runoff or impacts to surface water entering occupied areas could also influence water depth and flow, food resources, and other nutritional and physiological requirements of the species. Activities that avoid alteration of potential habitat or that result in minor and temporary degradation of potential habitat are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activities conducted within potential habitat could cause direct exposure to the species and interfere with the breeding, nesting, and feeding habits of the species if present. Activities that avoid impacts to potential habitat or that will only result in minor or temporary impacts are likely to have insignificant or discountable effects to the species. In addition, activity types that could increase the runoff, erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of surface water entering rivers/streams or other

waterbodies occupied by the species could cause direct exposure and may affect the species. Actions that avoid or include conservation measures to limit runoff, erosion and sedimentation, and potential contamination of surface water are likely to have insignificant or discountable effects to the species.

5.4.2 Eastern Massasauga Rattlesnake (*Sistrurus catenatus*)

Habitat Loss/Degradation

Eastern massasauga rattlesnakes live in wet areas (wetlands, wet prairies, marshes, fens, sedge meadows, peatlands, scrub-shrub and floodplain forests, old fields, and roadside/drainage ditches) and adjacent upland areas (shrubland, open woodlands, prairie, grassland, riparian forest) (USFWS 2021b). Activities that would directly alter these habitats could impact the breeding, feeding, movement, and hibernation habits of the species if present (USFWS 2021a). Activities that avoid alteration of potential habitat or that result in minor or temporary degradation of potential habitat are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activities located within occupied habitat of an eastern massasauga population could result in direct exposure to the species and/or interfere with the breeding, feeding, movement, and hibernation success of the species. Activities located outside of a known eastern massasauga habitat are likely to have no effect or insignificant or discountable effects to the species.

Hydrology

Activities affecting hydrology (surface or groundwater conditions) in occupied areas could impact hibernation habitat and overwinter survival of the species (USFWS 2016b). Activities with no impact to hydrology or that result in minor or temporary degradation of hydrologic conditions are likely to have no effect or insignificant or discountable effects on overwinter survival of the species.

Road/Trails/Linear Features

The construction of new roads or trails or modification (alignment/configuration/surface type) of existing road or trails may lead to increased vehicle/bike traffic and increased risk of road mortality or injury to the species in occupied areas (USFWS 2016b). Activities that involve the maintenance of existing roads and trails and that would not lead to an increase in vehicle/bike traffic are likely to have insignificant or discountable effects to the species. Construction of new linear features such as roads, trails, fences, walls, canals, or other permanent barriers may also cause habitat fragmentation and/or restrict movement and dispersal of the species.

Erosion Control

Activities involving the use of erosion control products/materials could restrict movement of the species and cause injury if the species becomes ensnared/entangled. Erosion control methods that are temporary, utilize wildlife-safe materials, and avoid the use of plastic mesh netting or other similar materials that may ensnare individuals are likely to have insignificant or discountable

effects on the species. In addition, activities that include measures to minimize runoff, erosion and sedimentation, and/or contamination of potential habitat are likely to have no effect or insignificant effects to the species.

Earth-moving (grading, filling, digging, trenching, disking, etc.) Activity

Activities that will cause ground disturbance may impact potential habitat including hibernation habitat of the species and could cause mortality or injury to the species if present including crushing or burying. Activities that avoid hibernation habitat, result in minor ground disturbance, and that are conducted in a manner to minimize the potential for injury/mortality are likely to have insignificant or discountable effects.

Prescribed burning/mowing

Prescribed burning may affect individual eastern massasauga adversely through exposure to heat, smoke, and carbon monoxide, increased predation risk, and positively/negatively through habitat modifications and resulting changes in their food base (USFWS 2016b). Exposure to heat and smoke can cause harm from death or injury directly if conducted in suitable habitat when individuals are present. Mowing in suitable habitat could also cause mortality or injury to the species if present including crushing or blade strike. Projects involving these activities within suitable habitat will require additional coordination with the field office to ensure the effects are insignificant or discountable.

Herbaceous Vegetation Management

Herbaceous vegetation (brush, shrubs, trees) removal may expose individuals to potential harm from crushing or blade strike; however, this action may also improve habitat for the species and reduce predation risk (USFWS 2016b). Removal involving hand cutting and where access to the site is limited to foot traffic or low-impact equipment such as lightweight, all-terrain vehicles (ATVs) or utility task vehicles (UTVs) are likely to have no effect, insignificant or discountable effects, or beneficial effects to the species.

Herbicide and Pesticides

Eastern massasauga rattlesnakes may be exposed to herbicide or pesticides if applied in occupied habitats or if applied in conditions which would cause drift of contaminants into occupied habitats including hibernation habitat. Large-scale or aerial herbicide or insecticide spraying are more likely to result in direct application or drift of contaminants into suitable habitat and/or impact surface water sources. Targeted herbicide application methods (spot-spraying or direct application to plant stems or trunk), conducted according to label instructions, and under conditions that will limit drift, runoff, and potential contamination of surface and groundwater are likely to have insignificant or discountable effects to the species. The use of pesticides in occupied areas will require additional coordination with the field office.

5.5 Effects Analysis for Fish

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation

- Exposure risk/disturbance

5.5.1 Pallid Sturgeon (*Scaphirhynchus albus*)

Habitat Loss/Degradation

Pallid sturgeons are generally found in large, free-flowing, warm-water, and turbid rivers with a diverse assemblage of dynamic physical habitats (specifically, the Missouri and Mississippi rivers and lower reaches of larger tributaries to these rivers) (USFWS 2014). Pallid Sturgeon primarily utilize main channel, secondary channel, and channel border habitats throughout their range. Activities that would alter these habitats could impact the spawning, rearing, overwintering, and feeding habits of the species if present (USFWS 2014). Activities that avoid alteration of potential habitat or that result in minor (less than 0.5 acres or 500 feet of linear shoreline) and temporary degradation of potential habitat are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activities conducted within potential habitat could cause direct exposure to and interfere with the breeding, spawning, rearing, overwintering, and feeding habits of the species if present (USFWS 2014). In addition, activity types that could increase the runoff, erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of surface water entering rivers/streams occupied by the species could cause direct exposure and may affect the species. Activities that avoid impacts to potential habitat or that will only result in minor or temporary impacts and include conservation measures to limit runoff, erosion and sedimentation, and potential contamination of surface water are likely to have insignificant or discountable effects to the species.

5.5.2 Topeka Shiner (*Notropis topeka*)

Habitat Loss/Degradation

Topeka shiners are generally found in small prairie streams with low to moderate flow, off-channel habitats such as oxbows, backwaters, and floodplain pools, ponds, dugouts, and associated stream banks with grassy or vegetated margins (USFWS 2021a). Activities that would alter these habitats could impact the spawning, rearing, and feeding habits of the species if present. Activities that avoid alteration of potential habitat or that result in minor and temporary degradation of potential habitat are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activities conducted within potential habitat could cause direct exposure and interfere with the breeding, spawning, rearing, movement, and feeding habits of the species if present (USFWS 2021a). In addition, activity types that influence ground or surface water (stream, river, waterbodies) quantity or flow or that result in increased runoff, erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of surface water entering rivers/streams occupied by the species could cause direct exposure and may affect

the species. Activities that avoid impacts to potential habitat or that will only result in minor or temporary impacts and include conservation measures to limit runoff, erosion and sedimentation, and potential contamination of surface water are likely to have insignificant or discountable effects to the species.

5.5.3 Topeka Shiner (*Notropis topeka*) Critical Habitat

Critical habitat is designated in the North Raccoon River, Boone, and Rock River Watersheds in Iowa (USFWS 2004). Project activities that alter habitat for the species could significantly impact the breeding, spawning, rearing, movement, and foraging habits of the species. Projects that do not have a federal nexus or will avoid alterations of topeka shiner habitat quality, quantity, or availability will result in a no effect or not likely to adversely affect determination for critical habitat.

5.6 Effects Analysis for Freshwater Mussels

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation
- Exposure risk/disturbance

The effects of proposed actions on listed freshwater mussels and their habitats are similar between species; thus, we are providing a combined effects section for all listed mussel species.

5.6.1 Freshwater Mussels

Habitat Loss/Degradation

Freshwater mussels are found in rivers and streams and often bury or lodge themselves in the bottom substrate. They are often found in areas of sand, gravel, and/or clay substrates. Some species may be found behind or under rocks, boulders, or bedrock shelves where they are protected from the current. Freshwater mussels require a stable, undisturbed habitat and are vulnerable to habitat alterations including water quality degradation and flow modifications.

Activities that would alter habitat conditions including substrate composition, water quality, and water flow could impact the reproduction, rearing, overwintering, and feeding habits of the species if present. Activities that avoid alteration of potential habitat or that result in minor and temporary degradation of potential habitat are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activities conducted within or that would alter potential habitat could cause direct exposure to the species and interfere with reproduction, rearing, overwintering, and feeding habits of the species if present. Activities affecting hydrology (surface or groundwater conditions including groundwater depletion) in occupied areas could impact habitat conditions and survival of the species. In addition, activity types that increase the runoff, erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of surface water entering rivers/streams occupied by the species could cause exposure and may affect the species

and/or influence water depth and flow, food resources, and other nutritional and physiological requirements of the species. Activities with no impact on hydrology or that result in minor or temporary degradation of hydrologic conditions are likely to have no effect or insignificant or discountable effects on survival of the species. Also, actions that limit or include conservation measures to limit runoff, sedimentation, and potential contamination of surface water or groundwater are likely to have insignificant or discountable effects on the species.

5.6.2 Rabbitsfoot Mussel (*Quadrula cylindrica cylindrica*) Critical Habitat

In Illinois, critical habitat has been designated in the Ohio River and Vermilion River (North Fork and Middle Branch North Fork Rivers) Watershed (USFWS 2015). Project activities that alter the primary constituent elements (physical and biological features) of critical habitat for the species could significantly impact the conservation of the species. The physical and biological features include geomorphically stable river channels and banks with suitable habitats, adequate flows, adequate water and sediment quality, presence and abundance of host fish and low abundance of competitors and predators. Projects that do not have a federal nexus or will avoid alterations to potential habitat of the species including the primary constituent elements of critical habitat will result in no effect or not likely to adversely affect determination for critical habitat.

5.6.3 Sheepnose Mussel (*Plethobasus cyphus*) Critical Habitat

In Illinois, critical habitat has been designated in the Kankakee River and extends from the confluence of the Kankakee River with West Creek (Kankakee County, Illinois) downstream to its confluence with the Illinois River (Grundy County, Illinois) (USFWS 2026). Project activities that alter the primary constituent elements (physical and biological features) of critical habitat for the species could significantly impact the conservation of the species. The physical and biological features include adequate flows, suitable substrates and connected in-stream habitats, adequate water and sediment quality, and presence and abundance of host fish. Projects that do not have a federal nexus or will avoid alterations to potential habitat of the species including the primary constituent elements of critical habitat will result in no effect or not likely to adversely affect determination for critical habitat.

5.6.4 Snuffbox Mussel (*Epioblasma triquetra*) Critical Habitat

In Illinois, critical habitat has been designated in the Embarras River and extends from the East County Road 1550 North Bridge on the border of Crittenden Township and Camargo Township (Douglas County, Illinois) downstream to the County Road 1200 North Bridge in Cottonwood Township (Cumberland County, Illinois) (USFWS 2026). Project activities that alter the primary constituent elements (physical and biological features) of critical habitat for the species could significantly impact the conservation of the species. The physical and biological features include adequate flows, suitable substrates and connected in-stream habitats, adequate water and sediment quality, and presence and abundance of host fish. Projects that do not have a federal nexus or will avoid alterations to potential habitat of the species including the primary constituent elements of critical habitat will result in no effect or not likely to adversely affect determination for critical habitat.

5.6.5 Spectaclecase (*Cumberlandia monodonta*) Proposed Critical Habitat

In Illinois and Iowa, critical habitat has been designated in the Mississippi River and extends from the downstream side of Lock and Dam 14 at Hampton (Rock Island County, Illinois) downstream to Lock and Dam 19 at Keokuk (Lee County, Iowa) (USFWS 2026). Project activities that alter the primary constituent elements (physical and biological features) of critical habitat for the species could significantly impact the conservation of the species. The physical and biological features include adequate flows, suitable substrates and connected in-stream habitats, adequate water and sediment quality, and presence and abundance of host fish. Projects that do not have a federal nexus or will avoid alterations to potential habitat of the species including the primary constituent elements of critical habitat will result in no effect or not likely to adversely affect determination for critical habitat.

5.7 Effects Analysis for Snails

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation
- Exposure risk/disturbance

5.7.1 Iowa Pleistocene Snail (*Discus macclintocki*)

Habitat Loss/Degradation

The Iowa Pleistocene Snail occupies fragmented pockets of suitable habitat known as algific talus slopes which are found across portions of eastern Iowa and northwest Illinois (USFWS 1984). Algific talus slopes are generally described as rocky, cold-air producing, steep north-facing slopes. The rarity and fragility of these slopes support the need for preservation of this unique habitat. Any alteration of or impacts to algific talus slopes occupied by the species could significantly impact the breeding, rearing, and feeding habits of the species. Activities that avoid alteration of or avoid impacts to algific talus slopes and potential habitat of the species are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activity types that could increase erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of potential habitats and/or surface water runoff to potential habitats occupied by the species could cause direct exposure and may affect the species (USFWS 1978). In addition, activity types that result in the contamination of groundwater and/or impact air flow in areas occupied by the species could also have significant impacts on food resources and other nutritional and physiological requirements of the species. Actions that limit or include conservation measures to limit runoff, sedimentation, and potential contamination of surface water or groundwater are likely to have insignificant or discountable effects to the species. Activity types that would cause increased disturbance (human foot traffic, livestock grazing and trampling) in areas occupied by the species could impact breeding, rearing, and feeding habits of the species and could impact the survival of the species (USFWS 1978). Actions that limit or avoid disturbance to areas potentially occupied by the species are likely to have no effect or insignificant or discountable effects to the species.

5.8 Effects Analysis for Insects

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation
- Exposure risk/disturbance

5.8.1 Hine's Emerald Dragonfly (*Somatochlora hineana*)

Habitat Loss/Degradation

The Hine's Emerald Dragonfly occupies wet areas (wetlands, wet prairies, marshes, fens, sedge meadows) that are dominated by graminoid, or grass-like plants, and fed primarily by water from a mineral source or fens and utilize adjacent upland areas (shrubland, open woodlands, prairie, grassland) for foraging and roosting. Suitable habitats are found across portions of northeast Illinois. Any alteration or impacts to habitats occupied by the species could significantly impact the breeding, rearing, feeding, and roosting habits of the species (USFWS 2024). Activities that avoid alteration of or avoid impacts and fragmentation of potential habitat of the species are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activities located within occupied habitat of a known population could result in direct exposure to the species and/or interfere with the breeding, rearing, feeding, movement, and roosting habits of the species. Activities located outside of known habitat for the species are likely to have no effect or insignificant or discountable effects to the species.

Hydrology/water quality

Activities affecting hydrology (surface or groundwater conditions including groundwater depletion) in occupied areas could impact habitat conditions and survival of the species (USFWS 2024). The installation of underground fuel/chemical storage, septic systems, or installation of wells (water, oil, gas) could cause groundwater contamination or depletion within areas occupied by the species and impact the survival of the species. In addition, activities that could increase erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of potential habitats and/or surface water runoff to habitats occupied by the species could cause direct exposure and may affect the species. These activity types could also have significant impacts on food resources and other nutritional and physiological requirements of the species. Activities with no impact on hydrology or that result in minor or temporary degradation of hydrologic conditions are likely to have no effect or insignificant or discountable effects on survival of the species. Also, actions that limit or include conservation measures to limit runoff, sedimentation, and potential contamination of surface water or groundwater are likely to have insignificant or discountable effects on the species.

Herbicide and Pesticides

Hine's emerald dragonfly may be exposed to herbicide or pesticides if applied in occupied habitats or if applied in conditions which would cause drift of contaminants into occupied habitats. Large-scale or aerial herbicide or insecticide spraying are more likely to result in direct

application or drift of contaminants into suitable habitat and/or impact surface water sources. Targeted herbicide application methods (spot-spraying or direct application to plant stems or trunk), conducted according to label instructions, and under conditions that will limit drift, runoff, and potential contamination of occupied habitat, surface water, and groundwater are likely to have insignificant or discountable effects to the species. The use of pesticides in occupied areas will require additional coordination with the field office.

Road/rail

The construction of new roads/railways or modification (alignment/configuration/surface type) of existing roads/railways may lead to increased vehicles and increased risk of road mortality or injury to the species in occupied areas. Activities that involve the maintenance of existing roads/railways that would not lead to an increase in vehicle traffic are likely to have insignificant or discountable effects to the species. Construction of new roads/railways may also cause habitat fragmentation and/or restrict movement and dispersal of the species.

5.8.2 Hine's Emerald Dragonfly (*Somatochlora hineana*) Critical Habitat

In Illinois, 7 units across Cook, DuPage, and Will counties are designated as Critical habitat for the species (USFWS 2010). Project activities that alter the primary constituent elements (physical and biological features) of critical habitat for the species could significantly impact the breeding, rearing, foraging, and roosting habits of the species. Projects that do not have a federal nexus or will avoid alterations to potential habitat of the species including the primary constituent elements of critical habitat will result in a no effect or not likely to adversely affect determination for critical habitat.

5.8.3 Monarch Butterfly (*Danaus plexippus*)

Habitat Loss/Degradation

The monarch butterfly occupies fields, roadside areas, open areas, wet areas, urban gardens, etc. with milkweed and flowering plants present (USFWS 2020). Adult monarchs feed on the nectar of many flowers during breeding and migration, but they lay eggs on milkweed plants as that is the only food the caterpillars can eat. Alteration or impacts to habitats occupied by the species could significantly impact the breeding, rearing, feeding, and roosting habits of the species. Activities that avoid alteration of or avoid impacts and fragmentation of potential habitat of the species are likely to have no effect or insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activity types that could increase erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of potential habitats and/or surface water runoff to potential habitats occupied by the species could cause direct exposure and may affect the species (USFWS 2024). Actions that limit or include conservation measures to limit runoff, sedimentation, and potential contamination of surface water or groundwater are likely to have insignificant or discountable effects to the species.

Herbicide and Pesticides

Monarch butterflies may be exposed to herbicide or pesticides if applied in occupied habitats or if applied in conditions which would cause drift of contaminants into occupied habitats. Large-scale or aerial herbicide or insecticide spraying are more likely to result in direct application or drift of contaminants into suitable habitat and/or impact surface water sources. Targeted herbicide application methods (spot-spraying or direct application to plant stems or trunk), conducted according to label instructions, and under conditions that will limit drift, runoff, and potential contamination of occupied habitats and surface water are likely to have insignificant or discountable effects to the species. The use of pesticides in occupied areas may require additional coordination with the field office.

5.8.4 Poweshiek Skipperling (*Oarisma poweshiek*) Critical Habitat

Habitat Loss/Degradation

In Iowa, 11 units are designated as Critical habitat for the species (USFWS 2019). Project activities that alter the primary constituent elements (physical and biological features) of critical habitat for the species could significantly impact the breeding, rearing, foraging, and roosting habits of the species. Projects that do not have a federal nexus or will avoid alterations to potential habitat of the species including the primary constituent elements of critical habitat will result in a no effect or not likely to adversely affect determination for critical habitat.

5.9 Effects Analysis for Crustaceans

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation
- Exposure risk/disturbance

5.9.1 Illinois Cave Amphipod (*Gammarus acherondytes*)

Habitat Loss/Degradation

The Illinois cave amphipod is a *troglobitic*, meaning cave dependent, species that inhabits the dark zone of cave streams (USFWS 2002). This species is endemic to the Illinois Sinkhole Plain in Monroe and St. Clair counties in southwestern Illinois and is currently known from seven cave systems. Alteration to caves or associated sinkholes and streams occupied by the species could significantly impact the breeding, rearing, and feeding habits of the species (USFWS 1998). Impacts to groundwater and recharge areas for the cave systems occupied by the species could also have significant impacts on stream depth and flow, food resources, and other nutritional and physiological requirements of the species. Activities that avoid alteration of cave systems or that result in minor and temporary degradation of groundwater in the recharge areas are likely to have insignificant or discountable effects to the species.

Exposure Risk/Disturbance

Activity types that could increase the runoff, sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of surface water entering streams, sinkholes, or cave systems occupied by the species could cause direct exposure and may affect the species (USFWS 1998). In addition, activity types that result in the contamination of

groundwater and recharge areas for the cave systems could cause direct exposure and may affect the species. Actions that limit or include conservation measures to limit runoff, sedimentation, and potential contamination of surface water or groundwater are likely to have insignificant or discountable effects to the species. Any alterations that would cause increased disturbance (e.g. visitation) to cave systems occupied by the species could impact breeding, rearing, and feeding habits of the species and could also potentially result in effects to the species.

5.10 Effects Analysis for Plants

Qualifying actions typically involve one or more of the stressors addressed below:

- Habitat loss/degradation
- Exposure risk/disturbance

The effects of proposed actions on listed plants and their habitats are similar between species; thus, we are providing a combined effects section for all listed plant species. In addition, no effects to price's potato-bean or short's bladderpod are anticipated as these species are not currently known to occur in either Illinois or Iowa.

5.10.1 Plants

Habitat Loss/Degradation

The listed plant species can be found in a variety of prairie, grassland, and wetland habitats (see Section 4 for detailed habitat descriptions of each plant species). Activities that would result in a loss of potential habitat or that may alter habitat conditions could interfere with the reproduction, germination, growth, and overall survival and health of the plant species listed. Activities that avoid alteration of potential habitat or that result in minor and temporary degradation of potential habitat are likely to have no effect or insignificant or discountable effects to listed plant species. Activity types that result in the introduction of invasive plant species could also cause degradation of habitat conditions.

Exposure Risk/Disturbance

Activities conducted within or that would alter potential or known habitat of a listed plant species could cause direct exposure and interfere with reproduction, germination, growth, and overall survival and health if the species is present. Activity types that would cause ground disturbance (soil compaction or erosion), involve vegetation management (mowing, cutting, spraying, prescribed fire, etc.), involve vegetation disturbance (trampling, grazing, crushing by vehicle, etc.), and/or vegetation removal in occupied areas could impact habitat conditions and survival of the listed plant species (See Section 4 for a detailed description of threats to each plant species). Actions that limit or avoid disturbance to areas potentially occupied by the species are likely to have no effect or insignificant or discountable effects to the species. Activities affecting hydrology (surface or groundwater conditions including groundwater depletion) in wetland areas occupied by listed plant species could impact habitat conditions and survival of the species. In addition, activity types that increase the runoff, erosion and sedimentation, and/or cause contamination (herbicides, pesticides, human waste, animal waste, etc.) of surface water to habitats occupied by the species could cause exposure to and may affect the listed plant

species. Activities with no impact on hydrology or that result in minor or temporary degradation of hydrologic conditions are likely to have no effect or insignificant or discountable effects on survival of the species. Also, actions that limit or include conservation measures to limit runoff, sedimentation, and potential contamination of surface water or groundwater are likely to have insignificant or discountable effects on the species.

Herbicide and Pesticides

Listed plant species may be exposed to herbicide or pesticides if applied in occupied habitats or if applied in conditions which would cause drift of contaminants into occupied habitats. Large-scale or aerial herbicide or insecticide spraying are more likely to result in direct application or drift of contaminants into suitable habitat and/or impact surface water sources. Targeted herbicide application methods (spot-spraying or direct application to plant stems or trunk of target species), conducted according to label instructions, and under conditions that will limit drift, runoff, and potential contamination of occupied habitat, surface water, and groundwater are likely to have insignificant or discountable effects to the species.

6 Summary and Conclusion

After considering the relevant information pertaining to the species and critical habitat, reviewing the covered activities and associated required conservation measures, and evaluating their anticipated effects, we conclude that the actions subject to this standing analysis will support a federal action agency determination of “no effect” or support a section 7(a)(2) determination pursuant to the ESA of “may affect, not likely to adversely affect,” as appropriate, for the subject species and critical habitat as described above. This standing analysis is based on the consultation provisions of section 7(a)(2) of the ESA and the information cited and will undergo review and revision, as needed, if any of the following conditions have been met: 1) If new information reveals the effects of the covered action(s) to the covered species or critical habitat are occurring in a manner or to an extent not considered in this standing analysis based on applied use; or 2) If the species or critical habitat covered by the standing analysis has a change in status. This standing analysis will be provided on our website and through IPaC via a link within the DKey output letter.

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