

A Programmatic ESA Consultation Framework for Bridge Construction and Maintenance in Illinois

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*Abstract: Transportation agencies are required to comply with Endangered Species Act (ESA) Section 7 obligations for bridge and highway projects that intersect aquatic and floodplain habitats supporting federally listed species. In Illinois, bridge construction, replacement, maintenance, and repair activities frequently overlap with the ranges of federally listed freshwater mussels, the pallid sturgeon (*Scaphirhynchus albus*), and the threatened floodplain plant decurrent false aster (*Boltonia decurrens*). Project-by-project consultation for these routine actions can create administrative bottlenecks and add costs and delays in project delivery.*

This technical brief summarizes the development and application of the Illinois Department of Transportation (IDOT) Aquatic Species Bridge Replacement Programmatic Agreement (PA). The PA is a coordinated framework developed by the Illinois Department of Transportation with support from the University of Illinois Chicago (UIC), the Federal Highway Administration (FHWA), and the U.S. Fish and Wildlife Service (USFWS). The PA establishes standardized consultation pathways, effect determination criteria, and conservation measures applicable to bridge-related transportation activities with a federal ESA nexus. Covered actions are categorized by location (riparian versus instream) and by their anticipated biological effects, allowing low- or no-impact projects to proceed without separate, project-specific ESA consultation.

The programmatic approach incorporates tiered conservation measures (CMs) and monitoring and reporting requirements to ensure conservation and protection while improving regulatory efficiency. Outcomes include greater predictability for project planning, consistent implementation of conservation practices statewide, reduced consultation timelines for routine bridge projects, and improved protection of listed aquatic and floodplain species. The framework described herein provides an example for other transportation agencies seeking to balance species protections, infrastructure needs, and ESA compliance.

PROJECT PURPOSE

The purpose of the IDOT Aquatic Species Bridge Replacement Programmatic Agreement is to protect federally listed aquatic species and floodplain plants in Illinois while streamlining ESA Section 7 consultation for bridge-related transportation projects. The PA covers bridge maintenance and replacement activities that often involve similar construction methods, disturbance footprints, and conservation considerations.

Rather than conducting redundant individual consultations for each bridge action, the PA establishes a program framework that evaluates the effects of IDOT's broader bridge program. This approach reduces duplication of effort, increases consistency in effect determinations, and provides

predictable guidance for planners, designers, and environmental reviewers working on routine transportation projects.

BACKGROUND AND REGULATORY CONTEXT

Illinois maintains more than 35,000 transportation structures, many of which require repair or replacement due to age, deterioration, or changing safety standards. Bridge projects frequently occur within rivers, streams, floodplains, and associated riparian corridors that support federally listed species. Within Illinois, 11 federally listed freshwater mussel species, the endangered pallid sturgeon, and the threatened decurrent false aster occur in habitats potentially affected by bridge activities. These species are sensitive to changes in substrate, water quality, hydrology, sedimentation, and floodplain disturbance, all of which can result from construction and maintenance actions.

Project-specific ESA consultation can be time-intensive; leading to extended review timelines and administrative workloads. Variability in individual project documentation, conservation measures, and effect determinations also risks creating inconsistent administrative requirements and biological outcomes. The PA standardizes consultation procedures and conservation measures across IDOT's bridge program.

METHODS AND PROGRAMMATIC FRAMEWORK

Scope of Covered Actions

The PA applies to IDOT bridge projects with a federal nexus, including those funded through FHWA programs or requiring U.S. Army Corps of Engineers permits under Section 404 of the Clean Water Act. Covered actions include bridge construction, replacement, rehabilitation, demolition, maintenance, scour protection, culvert installation, roadway work directly associated with bridges, stormwater features, and temporary access or staging activities. The PA includes more than 100 distinct actions ranging from painting and guardrail replacement to adding turn lanes and bridge deck repair.

To evaluate individual actions in light of potential species and habitat impacts, activities are categorized by the type of action, plus its location in/outside waterways occupied by a listed species and containing potentially suitable habitat. This clarification is important for evaluating exposure pathways and determining appropriate conservation measures.

Species and Habitat Considerations

The PA incorporated species and habitat considerations throughout the review to ensure compliance with the Endangered Species Act. Thirteen federally listed species are covered in this agreement: eleven freshwater mussels, one fish (pallid sturgeon), and one floodplain plant (decurrent false aster) (Table 1). The PA uses species-specific information on distribution, habitat requirements, and threats for all covered species. Species information from past surveys and data collection efforts in Illinois informed the agreement (INHS, 2025; Murphy, 2022). Freshwater mussels depend on stable substrates, appropriate flow regimes, and water quality; pallid sturgeon rely on large-river channels with sand and gravel features; and decurrent false aster occupies floodplain habitats shaped by periodic inundation and disturbance. Mapped critical habitat designated for several species is present throughout the state (Figure 1). Incorporating this information into the PA allowed the research team and participating agencies to consider biological requirements when reviewing the actions included in the analysis.

Table 1. Federally Listed Species Currently Covered Under the Programmatic Agreement

Common Name	Scientific Name	Federal Status	Critical Habitat
Fanshell Mussel	<i>Cyprogenia stegaria</i>	Endangered	N/A
Fat Pocketbook Mussel	<i>Potamilus capax</i>	Endangered	N/A
Higgins' Eye Mussel	<i>Lampsilis higginsii</i>	Endangered	N/A
Northern Riffleshell Mussel	<i>Epioblasma rangiana</i>	Endangered	N/A
Orangefoot Pimpleback Mussel	<i>Plethobasus cooperianus</i>	Endangered	N/A
Pink Mucket Mussel	<i>Lampsilis abrupta</i>	Endangered	N/A
Rabbitsfoot Mussel	<i>Quadrula cylindrica cylindrica</i>	Threatened	Designated
Sheepnose Mussel	<i>Plethobasus cyphus</i>	Endangered	Designated
Snuffbox Mussel	<i>Epioblasma triquetra</i>	Endangered	Designated
Spectaclecase Mussel	<i>Cumberlandia monodonta</i>	Endangered	Designated
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	N/A
Decurrent False Aster	<i>Boltonia decurrens</i>	Threatened	N/A

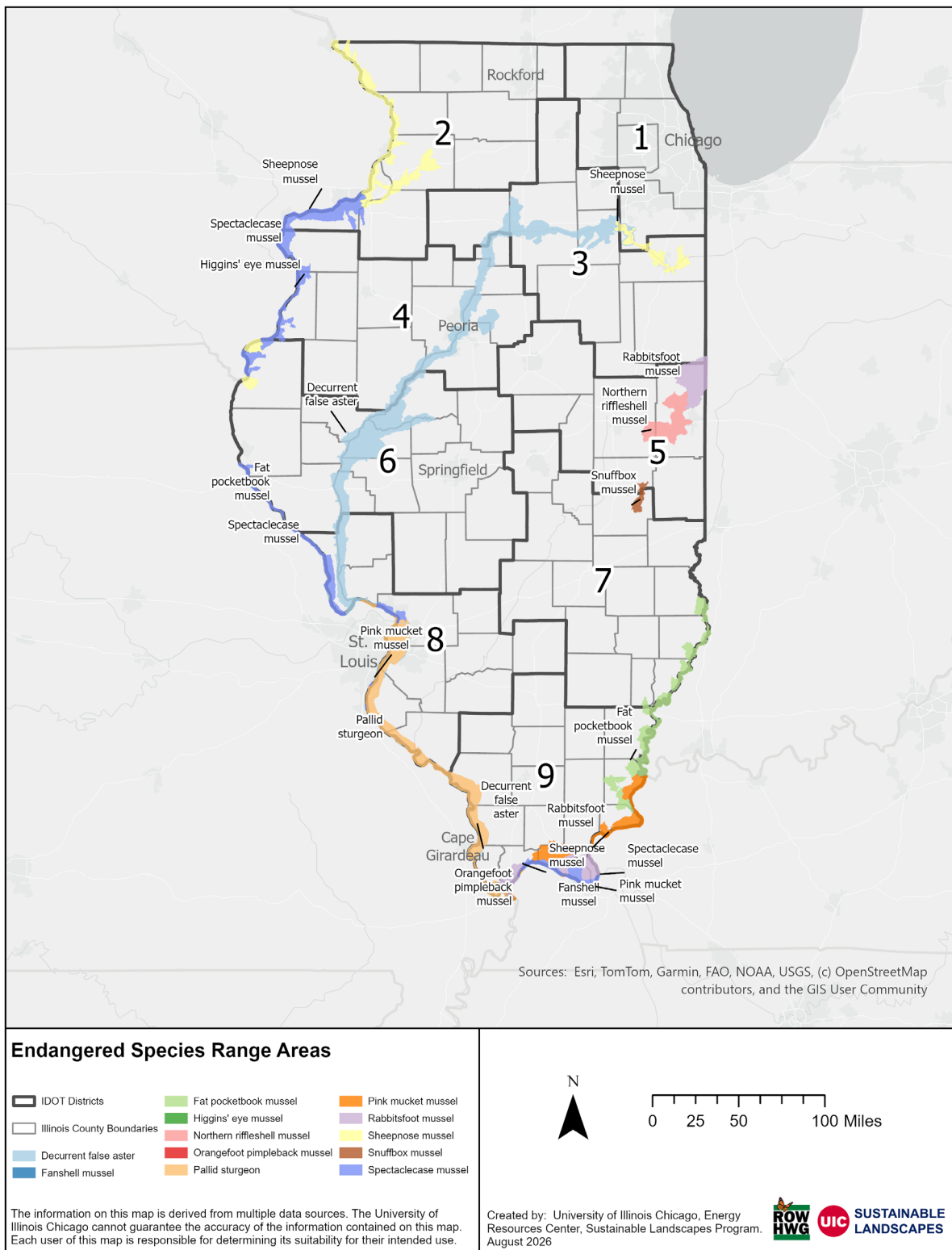


Figure 1. Map. Geographic locations of proposed and designated critical habitat in Illinois.

Source: University of Illinois Chicago, U.S. Fish and Wildlife Service

Conservation Measures

After analyzing the effects of the actions on species and habitats considered, the PA established tiered conservation measures to avoid and minimize potential impacts based on project scope and species presence.

- Tier 1 measures apply to projects occurring in or near occupied waters that have minor impacts or indirect effects on listed species. Tier 1 measures are above and beyond standard design elements or regulatory permit requirements. Measures include minimizing construction footprints, specialized design elements, contractor notification, and stormwater controls.
- Tier 2 measures address projects in occupied suitable habitat, incorporating design refinements, protective measures, and agency notifications to provide added protections.

Application of Tier 1 and Tier 2 conservation measures will be determined as part of the effects analysis for individual project actions. Measures are dependent on the project activity and the species involved. The PA includes monitoring, reporting, and adaptive management to ensure that species and habitat outcomes are tracked over time.

Effects Determination

Each activity included in bridge construction, replacement, rehabilitation, and maintenance projects was evaluated through a standardized effects analysis to determine its potential impacts on federally listed species and designated or proposed critical habitat, consistent with Section 7 consultation requirements under the ESA (USFWS, 1998). Based on this analysis, covered actions were assigned to one of three ESA effects determination categories:

- No Effect (NE): Actions that are not expected to affect listed species or critical habitat because they occur outside species ranges, avoid suitable habitat, or are limited to existing infrastructure with no pathway for direct or indirect effects.
- May Affect, Not Likely to Adversely Affect (NLAA): Actions that occur within species ranges or suitable habitat but for which effects are expected to be insignificant, discountable, or wholly beneficial when required avoidance and minimization measures (AMMs) are implemented.
- May Affect, Likely to Adversely Affect (LAA): Actions for which adverse effects to listed species or critical habitat are expected and cannot be reduced to insignificant or discountable levels through the conservation measures identified in this agreement.

Under this programmatic agreement, the USFWS will issue a biological opinion that provides programmatic authorization for projects that qualify for NE or NLAA determinations, allowing those projects to proceed without additional project-specific ESA consultation, provided all applicable terms, conditions, and conservation measures are met. Projects that do not reach a NE or NLAA through the Tier 1 consultation will coordinate with the Service on individual, Tier 2 consultation to evaluate those individual projects prior to construction.

OUTCOMES AND BENEFITS

Regulatory Efficiency

Development of this PA allows routine bridge construction, replacement, rehabilitation, and maintenance projects with predictable effects to proceed without repeated, project-specific ESA Section 7 consultation. The standardized effect determinations and conservation requirements in the PA reduce administrative burden, shortens consultation and review timelines, and improves interagency coordination among IDOT, FHWA, and USFWS. Anticipated outcomes include faster authorization of routine activities such as bridge deck repairs, minor instream maintenance, or debris removal where effects can be avoided or minimized. It also reduces duplication of analysis across similar projects statewide. This efficiency allows agency staff to redirect limited time and technical resources toward complex projects, sensitive habitats, or locations where listed species are present and site-specific coordination is most critical.

Conservation Consistency

The PA establishes a framework for evaluating effects and applying avoidance and minimization measures across IDOT projects. This ensures that conservation practices are implemented consistently across project locations and districts. Standardized conservation measures improves operational consistency and provides reliable protections for listed species and their habitats by reducing variability in project design assumptions and implementation practices. This consistency reduces the risk of confusion around application of protective measures and improves overall conservation outcomes by ensuring that projects result in consistent and appropriate levels of protection for listed species.

Predictability for Project Delivery

Clear definitions of covered actions, effect determination thresholds, and required avoidance and minimization measures provide greater clarity and certainty early in project planning and design. Project managers and designers can anticipate species avoidance and minimization requirements, incorporate conservation measures into preliminary engineering, and better align schedules, costs, and construction sequencing with environmental compliance needs. Anticipated outcomes include fewer late-stage project changes, reduced risk of construction delays due to unforeseen consultation requirements, and improved coordination between design and environmental review processes. This predictability supports planned transportation improvements while ensuring projects remain compliant with ESA obligations to protect listed species and their habitats.

CONCLUSIONS

The IDOT Aquatic Species Bridge Replacement Programmatic Agreement demonstrates how a programmatic ESA consultation framework can balance transportation infrastructure needs with environmental protection and regulatory compliance. By standardizing effect determinations and measures, the PA improves conservation as well as efficiency, consistency, and predictability for bridge projects across Illinois. This project offers an example for other transportation and resource agencies managing recurring activities within suitable habitat for federally listed species and critical habitat.

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