

ILLINOIS DEPARTMENT OF NATURAL RESOURCES MUSSEL SURVEY AND RELOCATION GUIDANCE

Overview of IDNR Mussel Survey and Relocation Guidance

Illinois Department of Natural Resources (IDNR) has developed mussel survey and relocation guidance for those conducting such activities in coordination with IDNR. This guidance provides coarse methodological frameworks, rather than highly detailed procedural direction, to allow flexibility in its application. Survey extent, monitoring, and relocation guidance, along with minimum survey data standards, provide a scope for these activities. IDNR strongly recommends coordination prior to initiating mussel surveys and requires such before relocation is attempted. Coordination with the U.S. Fish and Wildlife Service is required when activities include Federally-listed species and with the Illinois Endangered Species Program when state-listed species are involved.

Mussel Survey and Relocation Methods

Methods for collecting mussels are selected based upon the purpose for collection efforts (Table 1). The goal for each survey method is to supply sufficient data resolution and accuracy while balancing effort required to gather the data. Relocations may be authorized by IDNR for the purpose of scientific research or as a strategy to minimize harm to mussel assemblages. The table below provides a summary of mussel survey and relocation methods recommended by IDNR. Multiple methods may be used for a single survey or relocation effort if multiple goals are identified. IDNR developed these guidelines using best available science and may revise them as necessary.

Surveys and relocations shall occur when flow and water depth are conducive to visual and tactile detection of mussels. Water temperature shall be 15°C or greater and air temperature between 0 and 35°C.

Minimum Data Standards

IDNR has established a minimum resolution for information recorded during mussel surveys. These standards allow IDNR to characterize mussel assemblages, evaluate impacts or conservation actions, and assess survey methods.

For each individual:

- Species name
- Growth ring count (IDNR may limit counts to 100 individuals per non-listed species for some surveys)
- Length
- Transect/quadrat/pass/search hour identification (if applicable)
- Tag/mark identification (if applicable)
- GPS coordinates of collected individuals (typically for listed species only)

For each reach/transect/quadrat:

- Length/area surveyed

- GPS coordinates
- Predominant substrate (10m intervals for non-wadeable transects)
- Mean depth

Survey Extent

When applicable, survey area includes both the area of direct impact (ADI) and a relevant buffer. The ADI typically is delineated by impact footprint (including equipment staging/access). Extent of lateral and longitudinal buffers around the ADI is determined by the type and intensity of impact. IDNR typically uses 5m, 10m, 30m, or 50m buffers, often with the downstream buffer greater than lateral or upstream buffers.

Mussel Relocation

IDNR may recommend relocation of mussels from a focal area as a method for minimizing harm. Mussels are removed from the ADI and a relevant buffer (i.e., donor area). A relocation site at least 300m downstream of the removal area is preferred. A relocation site shall have similar physicochemical characteristics as the donor site and shall contain a relatively robust mussel assemblage. IDNR may request that some individuals are tagged for later monitoring and evaluation of survival.

Monitoring Frequency and Extent

Post-impact monitoring may be recommended to evaluate efficacy of avoidance and minimization measures or recovery of mussel assemblages. IDNR recommends monitoring events one- and five-years post-impact to evaluate short and long-term survival or recovery. Both the ADI with relevant buffer and relocation area are monitored.

Permitting Mussel Surveys and Relocation

Mussels are protected under the Illinois Aquatic Life Code. Capturing and handling mussels requires a Scientific Collection permit. If capture and handling of state-listed species is expected during survey and relocation activities an Endangered Species permit is required. Relocation of mussels requires a Relocation permit.

IDNR Contacts

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Table 1. Recommended mussel survey methods organized by purpose for collecting mussels and stream size.

Collection Purpose	Methodological Framework	Methods for Wadeable Streams	Methods for Non-Wadeable Streams
Species inventory	Qualitative (timed visual/tactile search)	8-16 search hours per 300m stream reach.	8 search hours per 3,000m ² .
Abundance estimate	Semi-quantitative (transects or quadrats)	Minimum 260m total transect length or 10% of focal area, whichever is more. Multi-pass to <10% depletion. Transect location randomly selected.	Minimum 400m total transect length or 10% of focal area, whichever is more. Multi-pass to <10% depletion. Transect location randomly selected.
Species inventory and abundance estimate	Semi-quantitative (transects or quadrats) and supplemental qualitative (timed visual/tactile search)	Minimum 260m total transect length (or 260m ²) or 10% of focal area, whichever is more. Multi-pass to <10% depletion. Transect location randomly selected. 2-hour searches until no novel species are detected.	Minimum 400m total transect length (or 400m ²) or 10% of focal area, whichever is more. Multi-pass to <10% depletion. Transect location randomly selected. 2-hour searches until no novel species are detected.
Estimates of assemblage demographics and abundance	Quantitative (excavation of quadrats)	1 0.25m ² quadrat per 20m ² of focal area. Quadrat location randomly selected.	1 0.25m ² quadrat per 20m ² of focal area. Quadrat location randomly selected.
Delineation of significant mussel resources (e.g., 10 individuals per m ² , unusual concentration of mussels as per Illinois Natural Areas guidelines)	Varies, but typically qualitative or semi-quantitative	4 search-hour survey for evaluation of unusual concentration of mussels. Transects placed a maximum of 25m apart for delineation of mussel resources.	Transects placed 100m apart within focal area. Additional transects placed 25m apart if significant mussel resources are observed.
Survival estimate	Varies, but typically qualitative or semi-quantitative	See <i>Species inventory</i> or <i>Species inventory and abundance estimate</i> above	See <i>Species inventory</i> or <i>Species inventory and abundance estimate</i> above
Estimate of mussel mortality associated with acute kill events	Semi-quantitative in kill extent and reference reach(es)	Systematically selected 100m reaches. 1 search hour per 250m ² .	Transects placed 250m apart. Transects divided into 10m subsamples.
Relocation	Semi-quantitative (moving transects)	Entire focal area is searched. Multi-pass to <10% depletion.	Entire focal area is searched. Multi-pass to <10% depletion.