

## GUIDELINES REGARDING BIOLOGICAL AND ENGINEERING PROJECTS

### **LAKE AND RIVER ENHANCEMENT (LARE) PROGRAM INDIANA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FISH & WILDLIFE**

Indiana Code 9-18.1-14.5-6 authorizes the collection of boat registration fees by the Bureau of Motor Vehicles as well as noting the portion to be deposited into the lake and river enhancement fund established by IC 14-22-3.5. This fee is paid by boat owners as part of their annual watercraft registration and is used to pay costs incurred by the Department of Natural Resources (DNR) in implementing lake and river enhancement projects such as sediment removal, logjam removal, and invasive aquatic species control, as well as biological and engineering projects including but not limited to:

- A) Lake Diagnostic Studies
- B) Watershed Diagnostic Studies
- C) Engineering Feasibility Studies
- D) Engineering Design
- E) Engineering Design and Build
- F) Construction
- G) Dam Removal

These guidelines detail how the Department will perform these tasks.

#### **I. Guidelines Applicable to Biological and Engineering Projects**

##### **Philosophical Foundation**

The Lake and River Enhancement (LARE) Fund is administered by the Director of the Department of Natural Resources. The program is implemented by staff of the LARE Program in the Division of Fish & Wildlife (DFW). These aspects are accomplished through LARE grants awarded by the Director of the Department of Natural Resources to provide funding for rational, scientifically based, broad-scale remedial actions, the cost of which would otherwise hinder them from being carried out. The ultimate goal is to improve the ecological health and aquatic habitat of public lakes and rivers, and to enhance their use for various purposes, including recreation.

## Funding Considerations

Funds for Biological and Engineering Projects shall be prioritized toward those that benefit waters accessible to the general public. Projects prioritized for funding should directly or indirectly benefit waterbodies able to support watercraft required to be registered with the Indiana Bureau of Motor Vehicles or otherwise provide significant recreational or ecological benefit to the broader public. Lakes and rivers with free public access sites will be granted higher priority than those that can be accessed only by paying a fee or via commercially operated sites.

The range of requests for funding varies annually; therefore, no specific division of the funds among Biological and Engineering projects will be performed until all applications have been evaluated and prioritized. LARE funds are not intended to replace existing sources of funding and shall be used for purposes for which no other funding is available.

Applications for funding will not be accepted from individuals, but only from entities exhibiting the capability to properly represent the interests of a lake or river's residents and users, without any financial profit motive. Any applicant for LARE grant funding must be registered as a Vendor with the State of Indiana before an award can be granted. LARE staff will work with the sponsoring entity to help develop the requirements for the project. Due to the complexity of some LARE projects, it is recommended that potential applicants contact LARE staff *prior* to applying for funding to determine the details and needs of the project.

Projects awarded for funding must have a minimum of three bids requested to determine appropriate projects costs. Though one or more bids may be solicited during the application process to determine approximate project costs, bids should be requested after funding has been awarded. Bids must be reviewed by both the project sponsor and LARE staff to ensure all aspects of the project are included, though final contractor selection is deferred to the sponsor.

Funds will be made available for projects in the form of grants. Biological and Engineering Projects are eligible for up to \$100,000 in funding per project site. All grant awards will require a local matching contribution of at least 20%. "In-kind services" may be allowed as a portion of the local matching share, depending on the project type. A separate document on the current in-kind match policy is available on the [LARE website](#). LARE funds can be used to match funding from other sources, such as federal grants, which may fulfill the local sponsor's financial stake in the project. LARE payments are made in arrears, either incrementally during a project, or as a whole upon project completion. Sponsors are expected to contribute to their portion of the cost from the beginning of the project with each request for grant disbursement. Additionally, project progress reports should be provided with each request. As the project nears completion, generally, 15% of the entire LARE grant award will be held until the project is completed, including the provision of reports, site stability is established, and no further expense is envisioned. Project progress will be closely monitored by LARE staff to ensure consistency with LARE guidelines and procedures. Final reports are required for all projects.

## **General Procedures/Guidelines**

Application forms to be used are posted on the [LARE website](https://www.lare.dnr.in.gov) (<https://www.lare.dnr.in.gov> under the tab “Applying to the LARE program”. The application deadline for grants will be **January 15** of the year in which the project is proposed to begin. Sponsors will have 24 months to complete biological and engineering projects once funds have been awarded and encumbered with a state Purchase Order (PO).

## **II. Guidelines Regarding Diagnostic and Feasibility Studies**

### **A. Lake Diagnostics Studies**

Lake Diagnostic Studies (LDS) offer an essential, preliminary tool for guiding effective lake restoration and management strategies, particularly when water quality impairments become evident. These comprehensive investigations provide a detailed assessment of a lake and its immediate landscape by gathering data on water quality and local habitat characteristics in the lake and its primary tributaries. Water quality parameters investigated shall include phosphorus and nitrogen concentrations, temperature and dissolved oxygen profiles, and point-source and non-point source pollutants. Water quality analyses must be conducted by a reputable laboratory and shall follow the most recent analytical methods. Biological components such as flora and fauna populations may be evaluated using current or historical survey data with cooperation of the local Sponsor or the Indiana Department of Natural Resources.

Based on these findings, an LDS identifies and prioritizes potential in-lake or watershed-based restoration actions. This prioritization should consider the severity of identified problems, effectiveness of potential solutions, and feasibility of implementation. Factors such as financial costs, ecological benefits, regulatory compliance, and stakeholder support are all crucial considerations during this stage.

An LDS then aims to develop a strategic plan for implementing targeted efforts that will have significant positive impacts on the overall health of the lake. These future efforts can be made by the Sponsoring organization, often in coordination with local Soil and Water Conservation Districts who are tasked with connecting land users to sources of educational, technical and financial assistance to implement conservation practices and technologies.

Requirements for an LDS are provided in a draft Scope of Services document on the [LARE website](https://www.lare.dnr.in.gov). A final Scope of Services tailored specifically to the subject lake and its current needs or issues will be developed in coordination with LARE Program Managers prior to project bidding. Expectations and requirements for data collection and analyses, public outreach, document development, and final reporting are presented in the Scope available on the LARE website.

### **B. Watershed Diagnostic Studies**

Watershed Diagnostic Studies offer another preliminary tool for guiding effective restoration and management strategies. However, rather than targeting inlake impairments, a Watershed Diagnostic Study provides a broad assessment of a watershed (12-digit Hydrologic Unit Code, HUC-12, preferred) and its landscape by gathering historical data on water quality trends, analyzing watershed conditions via mapping and visual surveys, and modeling of nonpoint source pollution within local subwatersheds. Chemical data shall be field collected at the time of the study while biological components such as flora and fauna populations may be field collected or evaluated using historical survey data in cooperation with the local Sponsor or the Indiana Department of Natural Resources.

Based on these findings, the diagnostic study prioritizes potential restoration actions within the watershed. This prioritization considers the severity of identified problems, effectiveness of potential solutions, social or stakeholder support, and feasibility of implementation within the watershed's specific context. Assessment of cost-effectiveness, potential ecological benefits, regulatory requirements, and stakeholder engagement are crucial considerations during this stage. The aim is to develop a strategic plan for implementing targeted interventions that will have the most significant positive impact on the overall health of the watershed and its associated waterbodies. These future efforts can be made by the Sponsoring organization, often in coordination with local Soil and Water Conservation Districts who are tasked with connecting land users to sources of educational, technical, and financial assistance to implement conservation practices and technologies.

Though other state or federal agencies or organizations may offer opportunities for development of similar studies such as Watershed Management Plans, LARE funding may only be applied to projects or studies originating within the Indiana Department of Natural Resources.

Requirements for Watershed Diagnostic Studies are provided in a draft Scope of Services document on the [LARE website](#). A final Scope of Services tailored specifically to the watershed and its current needs or issues will be developed in coordination with LARE Project Managers prior to project bidding. Expectations and requirements for data collection and analyses, public outreach, document development, and final reporting are outlined in the Scope available on the LARE website.

### C. Engineering Feasibility Studies

Engineering Feasibility Studies are designed to assess the viability of construction projects aimed at maintaining and enhancing aquatic habitats, water quality, or dam removal. Preferably, project sites should be identified in a previous Lake or Watershed Diagnostic Study, or similar study such as a Watershed Management Plan developed through the Indiana Department of Environmental Management (IDEM).

Various sites may be investigated in an Engineering Feasibility Study, with characteristics of each site evaluated. Information presented as part of the feasibility study should include but are not limited to geographical location; floodplain analyses;

wetland, vegetation, and other habitat evaluations; land access and availability; stakeholder support and social implications associated with proposed construction activities; regulatory requirements and potential challenges; and overall environmental impact. All necessary engineering calculations and permit-level designs shall be completed for project sites determined to be feasible and appropriate for pursuing construction. Obtaining permits for a specified project is not generally required for Engineering Feasibility Studies; however, it may be incorporated into the project if the situation and funding allow.

BANCS (Bank Assessment for Non-point Source Consequences of Sediment) modeling can be incorporated into Engineering Feasibility Studies when stream restoration projects are considered a priority. This assessment quantifies streambank erosion and sediment yield, providing rapid assessment of multiple sites along a project stretch, especially when historical hydrologic data is limited, and is most suitable for evaluating streambank stability and erosion rates, rather than complex engineering issues.

Requirements for Engineering Feasibility Studies are provided in a draft Scope of Services document on the [LARE website](#). A final Scope of Services tailored specifically to the project will be developed in coordination with LARE Project Managers prior to project bidding. Expectations and requirements for feasibility analysis, public outreach, document development, and final reporting are outlined in the Scope available on the LARE website.

#### D. Engineering Design

An Engineering Design Project is typically initiated after an Engineering Feasibility Study (or an equivalent study) for one or multiple sites that were found to be acceptable to the sponsor, landowners and permitting agencies. All plans shall be stamped by an Indiana licensed engineer and the required state, federal, and/or local permits must be obtained and included in the design plan documents. Early coordination efforts with permit agencies are encouraged and a meeting with LARE staff and sponsors is often required at approximately 60% design phase.

Designs for streams and channel reconstruction should utilize natural design structures and techniques. Where appropriate, consideration should be given to increasing stream length and reconnection to isolated floodplains or wetlands. This includes sizing the channel for the same pattern, profile and dimension of a stable reach previously identified. Stream designs should include determining bankfull dimensions, velocity and discharge, as well as provide plan sheet drawings of all sites (including plan view, cross section and longitudinal profile). All constructed structures must be designed to withstand a 100-year flood event once they are fully established. For two-stage or single-stage ditch projects, all constructed benches should be based on the Bankfull event and designed for two times the width of the discharge channel.

Wetland projects should be designed so that no more than 25% of the total surface area is greater than 30 inches in depth.

Engineering designs may be applied to lake shoreline stabilization where appropriate. Generally, shoreline designs must include bioengineering techniques as defined in 312 IAC 11, incorporating the use of coir logs, glacial stone, toe wood, brush layering, native vegetation, and geotextile fabric. If deemed feasible all lake shoreline stabilization projects must include in-lake habitat in the form of woody material such as felled or embedded trees or root wads into the design. Regardless of design focus, the vegetative species incorporated into shoreline stabilization projects must be native to the geographic location and suitable for shoreline conditions as noted by their wetland indicator status. Streambank stabilization projects may include installation of a stone toe, an approved seed mix, the use of native live stakes, and/or native trees that are suitable for the geographical location of the project. The use of native pollinator species, either installed via seedmix or vegetative plugs, is encouraged in engineering designs for all project types.

Requirements for Design Studies are provided in a draft Scope of Services document on the [LARE website](#). A final Scope of Services tailored specifically to the project will be developed in coordination with LARE Project Managers prior to project bidding. Expectations and requirements for the design, public outreach, document development, and final reporting are outlined in the Scope available on the LARE website.

#### E. Engineering Design-Build

The goal of a Design-Build Project is to reduce nutrient inputs and sedimentation in lakes and rivers due to erosion and other forms of damage or habitat loss. These projects should focus more on straightforward, lower cost practices that do not require a complex design. This allows Design-Build Projects to proceed to construction sooner than a project that just receives a grant to focus solely on design. However, Design-Build Projects are still limited to the per site funding cap, so for certain projects it may be beneficial to seek out a design grant prior to applying for construction funding.

Design-Build Projects may include but are not limited to wetland restoration, bio-engineered seawalls, streambank stabilization, prairie and pollinator plantings, and aquatic vegetation plantings. Funds will be awarded to Design-Build Projects that focus not only on preventing erosion, but also on improving habitat. For additional design and construction guidelines, see sections D and F.

Requirements for Design-Build Projects are provided in a draft Scope of Services document on the [LARE website](#). A final Scope of Services tailored specifically to the project will be developed in coordination with LARE Project Managers prior to project bidding. Expectations and requirements for the design, construction, public outreach, document development, and final reporting are outlined in the Scope available on the LARE website.

#### F. Construction

The goal of a Construction Project is to reduce nutrient inputs and sedimentation in lakes and rivers due to erosion, and other forms of damage or habitat loss. These projects often follow completed Engineering Feasibility or Design Projects. Designs used for

construction not funded by LARE are still subject to requirements outlined in section D.

Projects can include but are not limited to wetland creation, streambank stabilization, and two-stage ditches. Funds will be awarded to Construction Projects that focus not only on preventing erosion, but also on improving habitat.

Projects that construct structures in the main channel of rivers should incorporate glacial stone and not rip-rap. Riprap may be used outside of the main river channel to reduce costs. Plans that involve the installation of grade control structures in a river should be constructed as rock riffles rather than traditional check dams, allowing for improved habitat and more efficient fish and wildlife passage. Riffles should be constructed with a minimum slope of 20 to 1 (Length: Height) or based on a reference riffle located above or below the project site. Projects should avoid the use of hard armoring such as vertical bulkhead materials and gabion baskets. LARE funds cannot be used to construct sediment traps. All disturbed areas must be seeded and disturbed slopes that are 3 to 1 (length: height) or steeper shall incorporate the use of photo-degradable loose-woven erosion control cloth or blanket to reduce the risk of erosion and minimize wildlife snaring. Seed must be a state approved seed mix suitable for the project area and application (i.e. bank stabilization mix, wetland swale, etc.). Tress incorporated into the project design or associated mitigation must be native to Indiana and suitable for the project location.

Funding for construction projects includes fees associated with obtaining all required federal, state, and/or local permits. All applicable permits must be obtained before construction is initiated and all permit conditions must be followed until the project has been deemed complete

Requirements for Construction projects are provided in a draft Scope of Services document on the [LARE website](#). A final Scope of Services tailored specifically to the project will be developed in coordination with LARE Project Managers prior to project bidding. Expectations and requirements for the construction, public outreach, document development, and final reporting are outlined in the Scope available on the LARE website.

#### G. Dam Removal

A vast majority of low-head dams in Indiana are now obsolete, are no longer used for their intended purpose, and create barriers and safety hazards on Indiana's waterways. Dam removal projects therefore aim to restore aquatic biodiversity, increase recreational opportunities and restore the natural flow of the impacted river. Although not a primary directive of the LARE Program, dam removal may also improve public safety by reducing drowning or accident risks.

Funding priority will be given to projects where the dam is to be fully removed. Dams should be removed down to or below the riverbed and should be clear of all debris and rebar.

It is generally preferred that the entire structure be removed from the river and debris

hauled off-site to an upland area. However, the historical significance of such structures may require that portions of the structure remain in place indefinitely. As a result, consultation with IN DNR Historical and Archeological staff is recommended as part of an early-coordination meeting or during the permitting process. In some instances, the wing walls may be left in place for bank stability, or other portions of the primary dam structure must be retained, even if below streambed grade. Stream channel stability will be monitored post-removal for any additional remediation activities that may be needed.

In limited instances, a partial removal may be considered when full removal is not an option. In these cases, the use of rock riffles will be constructed to provide similar benefits as full removal, including but not limited to habitat connectivity, aquatic organism passage, and reduction in hazard to public safety. Riffles should be constructed with a minimum slope of 20 to 1 (Length: Height). The design and grade of the riffle will be tailored to key aquatic species as needed but should generally ensure all aquatic species can pass upstream and downstream upon completion of the project during normal flow conditions.

Funding for dam removal projects includes obtaining all required permits, which typically include, but are not limited to, DNR Division of Water Construction in a Floodway Permit, IDEM Section 401 permits and associated sediment sampling, US Army Corps of Engineers Section 404 permits, and any required local planning or construction permits. All applicable permits must be obtained before dam removal is initiated and all permit conditions must be followed until the project has been deemed complete.

Requirements for Dam Removal Projects are provided in a draft Scope of Services document on the [LARE website](#). A final Scope of Services tailored specifically to the project will be developed in coordination with LARE Project Managers prior to project bidding. Expectations and requirements for the removal, public outreach, document development, and final reporting are outlined in the Scope available on the LARE website.