



Release Date: April 14, 2004

## **Lake Champlain Basin Program Announcement**

### **Request for Proposals**

### ***Lake Champlain Sea Lamprey Egg Survival***

The Lake Champlain Basin Program's Technical Advisory Committee is pleased to announce a Request for Proposals for the estimation of sea lamprey (*Petromyzon marinus*) egg survival. This information will be used to advance the accuracy and specificity of sea lamprey life history modeling efforts to improve evaluation of the effectiveness of alternative control strategies. This will achieve the next step in implementation of a long-term sea lamprey control program for Lake Champlain called for in the lakewide management plan for Lake Champlain, [\*Opportunities for Action\*](#).

The Basin Program is seeking proposals to estimate sea lamprey egg deposition and egg survival rates for two separate conditions – eggs that incubate inside the nest, and eggs that incubate outside the nest. The successful proposal will incorporate both field and laboratory studies to develop accurate estimates of egg survival rates.

The RFP is available from the Basin Program website at <http://www.lcbp.org> or you can contact the Basin Program office at 802/372-3213 (800/468-LCBP toll free in New York and Vermont), to receive a copy via US Postal Service.

To facilitate the review process, applicants must submit proposals in both paper and electronic format. Please see the RFP and attached proposal format information for complete details.

#### **DEADLINE NOTICE:**

**Hardcopy (8 copies) and electronic versions (no facsimiles) of proposals must be RECEIVED by the Lake Champlain Basin Program office by the close of business:**

**Friday, May 14, 2004.**

**LATE OR INCOMPLETE PROPOSALS WILL NOT BE CONSIDERED**

# Lake Champlain Basin Program Request for Proposals

## *Lake Champlain Sea Lamprey Egg Survival*

### **I. Background**

The Lake Champlain Basin Program is a partnership between state, provincial, and federal government agencies, as well as many local groups, all working together to protect and enhance the environmental integrity and the social and economic benefits of Lake Champlain. In 1996, the Basin Program completed *Opportunities for Action: An Evolving Plan for the Future of Lake Champlain*, a comprehensive management plan for Lake Champlain, addressing a range of issues from water quality to recreation. The highest priorities in the plan are reducing phosphorus pollution, reducing pollution from toxic contaminants, protecting human health, and controlling the introduction, spread, and impact of nuisance non-native aquatic species.

Implementation of a long-term sea lamprey control program is listed as one of the highest priority actions in the Managing Non-native Aquatic Nuisance Plants and Animals chapter of *Opportunities for Action*. Evaluation of feasible, effective, non-chemical control technologies is one of the critical elements of this long-term program.

The long-term control program integrates multiple strategies to control sea lamprey infestations throughout the Basin. Currently proven techniques include barriers to lamprey migrations, selective pesticides, and trapping. Although additional non-chemical control techniques are being intensively researched by government agencies and research institutions involved in sea lamprey control (e.g., lamprey pheromones), other opportunities may exist for furthering our ability to control lamprey populations through alternative (i.e. non-chemical) methods. *Opportunities for Action* supports an integrated control program, and lists development of new control technologies as one of its action items.

An initial population viability model has been developed by researchers at the University of Vermont to investigate its applicability to sea lamprey management in the Lake Champlain Basin. This model has begun to identify the most important life history stages for management to focus on. In addition, it has laid an important foundation for building a more comprehensive model that would be able to include all lamprey-producing tributaries flowing into Lake Champlain. Perhaps most importantly, the model provides a consistent framework to evaluate all management options for sea lamprey. It is hoped that the model will provide the necessary tool for simultaneously and objectively evaluating sea lamprey control options, while providing flexibility for evaluating many different kinds of solutions to this complex management issue, including the cumulative impact of combining alternative control techniques. This new tool has emerged as the common “language” that is being used by the Lake Champlain Sea Lamprey Control Alternatives Workgroup (“Alternatives Workgroup”) and its diverse stakeholder groups to discuss sea lamprey control options in an objective, unbiased way.

The model has helped to identify sea lamprey life stages most vulnerable to control, thus having the greatest ability to affect population maintenance and growth. It has also identified two important sea lamprey biology and life-history information gaps: survival rates of eggs incubated within the nests constructed by lamprey and the survival rates of eggs that are washed from the nest during spawning. Preliminary results of the model indicate that if egg survival outside the nest is even moderately high, the effectiveness of techniques that target lamprey nests (e.g., destroying sea lamprey nests while eggs are incubating) would be low.

## **II. Estimating Sea Lamprey Egg Survival Inside and Outside of the Nest**

The Basin Program is seeking proposals to provide estimates (and associated estimates of variability) of sea lamprey egg deposition and egg survival rates for two, separate conditions – eggs that incubate inside the nest, and eggs that incubate outside the nest. In particular, this study must include estimates of the proportion / percent of sea lamprey eggs that are deposited and remain in the nest for the duration of their incubation period, and their survival rates to no less than lamprey organogenic stage XII (head formation) as described by Piavis (1961, 1971). The successful proposal will incorporate both field and laboratory studies to develop accurate estimates of egg deposition and survival rates for inclusion in the Lake Champlain sea lamprey population viability model, and justification for the choice of each experiment. Finally, the proposal should provide justification for the degree to which the proposal's methods address the variety and variability of ecological conditions within the Lake Champlain Basin's tributaries. As the results of this study must be representative of and applicable to sea lamprey in the Lake Champlain Basin, the proposal should provide justification of its basin-specific applicability.

### **Tasks:**

- The successful applicant will provide estimates, including measures of variability, for lamprey egg survival parameters in the Lake Champlain sea lamprey population viability model, including: 1) the proportion of sea lamprey eggs deposited within and outside of nests, and 2) survival of eggs to at least stage XII, both within and outside of lamprey nests. These parameters must be applicable to sea lamprey populations within the Lake Champlain Basin, including the Poultney River, Vermont.
- The successful applicant's study design should address inter-stream variability by identifying factors such as temperature, discharge, river morphology, velocity, substrate type(s), hyporheic influences, and distance from the spawning grounds, which affect egg survival both within and outside of nests, within a stream.
- The successful applicant's study should include laboratory experiments that would help refine our understanding of the effects of physical factors on survival of lamprey eggs incubating outside of lamprey nests.
- The successful proposal will describe how the applicant will identify data gaps and information needs resulting from this study.

- The successful applicant will be required to provide preliminary estimates of survival by the December 2005 progress report for inclusion in Lake Champlain's sea lamprey population viability model and consideration by the Alternatives Workgroup.
- The successful applicant will be required to prepare brief quarterly reports documenting progress on each objective and task in the project (see Proposal Format Requirements below). A final report describing all data, methods, results, and QA/QC procedures will be required at project completion.
- The applicant will be required to present the project results to the Technical Advisory Committee and/or the Lake Champlain Steering Committee.

**Additional proposal elements that would be helpful but are not required:**

Proposals are encouraged to include tasks that will address the following elements if appropriate for the amount of available funds:

- In addition to the above estimates of sea lamprey egg survival rate to stage XII, the proposal will describe how the project will obtain and provide information on the relative influence of differing factors impacting egg deposition rates (e.g., flow velocity, time of year, substrate type, nest density, nest superimposition, etc.).
- The proposal will describe how the project will obtain and provide information regarding the relative importance of differing causes of mortality on egg survival. In particular, the relative differences of "natural" incubation rates in the nest versus outside the nest and the impact of predation on survivorship have been identified as likely critical factors.
- Survival from the time of hatching (stage XIII) until the burrowing larval phase (stage XVII) may differ inside the nest versus outside the nest. Evaluations of the differences in survival during this prolarvae stage inside and outside the nest would add important information required to fully understand survival rates from the point of fertilization to the burrowing larval stage.

**Conclusion:**

In summary, the successful proposal will best combine a clear outline for accomplishing the required tasks with a specific means for providing additional information concerning the other elements also suspected of playing an important role in egg survival.

## **References:**

Piavis, G.W. 1961. Embryological stages in the sea lamprey and effects of temperature on development. USFWS Fishery Bulletin. 61:111-143.

Piavis G.W. 1971. Embryology. In: Hardisty MW, Potter IC (eds.). The biology of the lampreys, vol 1. Academic Press, London, pp 361–400.

*For more information regarding the Lake Champlain Sea Lamprey Population Viability Model please contact LCBP at 802-372-3213 for a copy of the project report / white paper: “Stage-Based Population Viability Model for Sea Lamprey (Petromyzon marinus).”*

### **III. Summary of Other Requirements for the Selected Proposal**

- To be eligible, the selected project is required to show a non-federal match equal to 25% of the total project cost (i.e., award + match – see below for more information).
- For the selected proposal, an approved workplan will be required before a contract can be completed and the work begun.
- A Quality Assurance Project Plan must be submitted and approved by EPA before data collection begins. Such proposals should allow at least eight weeks for QAPP review and approval.
- When approved, the final report will be edited for content and style in consultation with the contractor and published as part of the Basin Program’s Technical Report Series. The author(s) is also encouraged to submit one or more articles resulting from the project for publication in a peer-reviewed scientific journal.

### **IV. Eligibility**

Eligible organizations include colleges, universities, nonprofit organizations, for-profit companies, and government agencies.

### **V. Proposal Evaluation and Selection Criteria**

Proposals will be judged according to how well they address the following:

1. Demonstrated understanding of sea lamprey life history and sea lamprey control issues and management programs in the Lake Champlain Basin.
2. Demonstrated knowledge of and experience in fisheries field and lab methodologies.

3. Technical merit of the proposal.
4. Technical credentials of the investigators.
5. Extent to which the proposal addresses the tasks described in Section II.
6. Potential to enhance the technical infrastructure and abilities within the basin.
7. Institutional support of the investigators, including the ability to provide the required non-federal 25% match.
8. Provision of a public education element (at minimum, a project summary intended for lay audiences is required).
9. Clarity, conciseness and adherence to the attached proposal guidelines.
10. Demonstrated ability to create documents that are accessible to and can be used by local natural resource managers.

## **Budget and Match Requirements**

A total of \$30,000 is available for this project. A 25% match (\$10,000) of total project cost is required, either as funds or in-kind services. Budget proposals should clearly document the intended use(s) and source(s) of matching contributions. Federal funds may not be used as a source of matching funds.

## **Period of Performance**

Work is to be completed within 18 months of the execution of a contract.

## **Schedule and Requirements for Proposal Submission**

- Please follow the format requested in the attached proposal guidelines.
- Eight (8) paper copies of each proposal must be RECEIVED by the LCBP office by close of business on **Friday, May 14, 2004.**
- In addition, please submit an ELECTRONIC VERSION of your proposal, either on diskette or via e-mail. Electronic versions must also be RECEIVED by close of business on **Friday, May 14, 2004.**
- An approved workplan will be required before a contract can be completed and the work begun. Projects involving environmental data collection must also submit a Quality Assurance Project Plan to EPA. QAPPs must be approved prior to the start of any data collection work.

Send proposals and direct all questions to:

Miranda Lescaze  
Technical Coordinator  
Lake Champlain Basin Program  
PO Box 204  
54 West Shore  
Grand Isle, VT 05458

802/372-3213  
[mlescaze@lcbp.org](mailto:mlescaze@lcbp.org)

## **Lake Champlain Basin Program**

### **Technical Proposal Format Requirements**

Proposals should adhere to following format and an 8 page maximum length (font size 12), not including budget information, references cited and investigator resumes.

**TITLE** - concise and descriptive.

**POINT OF CONTACT:** Name, organization, address, and electronic mail address.

**ABSTRACT:** Brief description of proposed work.

**INTRODUCTION:** Brief overview of what the project is, how it relates to past projects (in the basin and elsewhere), and what it will accomplish in relation to the RFP.

**OBJECTIVES AND TASKS:** List the project's objectives and describe in detail the tasks that will be performed relative to each objective, including methods and approaches.

**Note:** Projects involving environmental data collection must submit a Quality Assurance Project Plan to EPA. QAPPs must be approved prior to the start of any data collection work.

**DELIVERABLES:** Detailed description of the planned products from each task of the project. Required deliverables: quarterly progress reports and a final report.

**SCHEDULE:** Timeline showing anticipated dates for completion of the major tasks and deliverables. Quarterly progress reports are due on the last day of December, March, June, and September. Work is to be completed within two years of the execution of a contract.

**DETAILED BUDGET JUSTIFICATION:** Cost breakdown by major budget categories (i.e. personnel, equipment), linking costs to specific tasks/deliverables wherever possible. Breakdown should show both LCBP costs, costs covered by partner organizations (if applicable), required match amounts, and totals. A non-federal match equal to 25% of total project costs is required, either in funds or in-kind services (e.g. for \$90,000 the match equals \$30,000 which is 25% of \$120,000). (1 page, not included in the 8 page maximum total for the proposal)

**TECHNICAL REFERENCES CITED:** List all references used for the proposal (not included in the 8 page maximum total for the proposal).

**CURRICULUM VITAE/RESUME OF PRINCIPAL INVESTIGATORS:** Include up to 5 references for publications pertinent to proposed project. Please limit to one page per investigator, not included in the 8 page maximum total for the proposal.