



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



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Robert R. Scott, Commissioner

May 6, 2019

His Excellency, Governor Christopher T. Sununu
and The Honorable Council
State House
Concord, NH 03301

REQUESTED ACTION

Authorize the Department of Environmental Services to enter into a **SOLE SOURCE** agreement with the University of New Hampshire, Durham, NH, (VC #177867-B046) in the amount of \$8,000 to complete the *Invasive Species Detection in Northeast Regional Lakes using Environmental DNA (eDNA)* project, effective upon Governor and Council approval through December 31, 2020. 100% Lakes Restoration Funds.

Funding is available in the account as follows:

	<u>FY 2019</u>
03-44-44-442010-1430-073-500580	\$8,000
Dept. Environmental Services, Lakes Restoration Program, Grants-Nonfederal	

EXPLANATION

This agreement is **SOLE SOURCE** because this study is a regional effort comprised of multiple states contributing financially and collaboratively in this research endeavor, through the Northeast Aquatic Nuisance Species Panel, to which NHDES is a delegate. The genesis of this project was within this regional panel, and that panel selected the University of New Hampshire (UNH) to conduct this work, as an extension of baseline work already done on the panel level. The UNH Department of Civil and Environmental Engineering has been involved in expanding eDNA services for a variety of regional projects, and this is a contribution to a regional cooperative with UNH to develop an eDNA identification method and service for invasive aquatic animals in surface water systems in the region. The products delivered by this project will expand both state and regional efforts at early detection and rapid response initiatives.

Invasive aquatic animals are a threat to the biological, ecological, chemical and economic values of our surface waters. Because of their small size and sparsity when newly introduced to a waterbody, early detection is often hard to achieve. A waterbody could thus be a source of contamination on transient recreational gear, which could then be transported by unknowing recreation enthusiasts. Having an established eDNA tool will allow state biologists to detect these species early, and post public access sites with critical information.

Final products will include: development of a sampling plan and preparation of a method for lab verification for species, field sampling for validation of method, and a summary of findings and recommendations for program expansion.

The total project cost is \$35,000, which will be shared among New England states. The New Hampshire Department of Environmental Services (NHDES) Lakes Restoration Fund proposes to contribute \$8,000 towards this method development and validation. Though the grant award is less than the \$10,000 threshold, the agreement requires G&C approval as UNH has received funds in excess of the threshold for this fiscal year.

In the event that Lake Restoration Funds become no longer available, general funds will not be requested to support this program. The agreement has been approved by the Office of the Attorney General as to form, execution, and content.

We respectfully request your approval.

A handwritten signature in black ink, appearing to read "Robert R. Scott", is written over a solid horizontal line.

Robert R. Scott, Commissioner

COOPERATIVE PROJECT AGREEMENT

between the

STATE OF NEW HAMPSHIRE, Department of Environmental Services

and the

University of New Hampshire of the UNIVERSITY SYSTEM OF NEW HAMPSHIRE

A. This Cooperative Project Agreement (hereinafter "Project Agreement") is entered into by the State of New Hampshire, **NH Department of Environmental Services**, (hereinafter "State"), and the University System of New Hampshire, acting through **University of New Hampshire**, (hereinafter "Campus"), for the purpose of undertaking a project of mutual interest. This Cooperative Project shall be carried out under the terms and conditions of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, except as may be modified herein.

B. This Project Agreement and all obligations of the parties hereunder shall become effective on the date the Governor and Executive Council of the State of New Hampshire approve this Project Agreement ("Effective date") and shall end on **12/31/20**. If the provision of services by Campus precedes the Effective date, all services performed by Campus shall be performed at the sole risk of Campus and in the event that this Project Agreement does not become effective, State shall be under no obligation to pay Campus for costs incurred or services performed; however, if this Project Agreement becomes effective, all costs incurred prior to the Effective date that would otherwise be allowable shall be paid under the terms of this Project Agreement.

C. The work to be performed under the terms of this Project Agreement is described in the proposal identified below and attached to this document as Exhibit A, the content of which is incorporated herein as a part of this Project Agreement.

Project Title: Invasive Species Detection in Northeast Regional Lakes using Environmental DNA (eDNA)

D. The Following Individuals are designated as Project Administrators. These Project Administrators shall be responsible for the business aspects of this Project Agreement and all invoices, payments, project amendments and related correspondence shall be directed to the individuals so designated.

State Project Administrator

Name: Amy P. Smagula
Address: NHDES
29 Hazen Drive
Concord, NH 03301
Phone: 603 271-2248

Campus Project Administrator

Name: Cheryl Moore
Address: University of New Hampshire
Sponsored Programs Administration
51 College Rd. Rm 116
Durham, NH 03824
Phone: 603-862-1992

E. The Following Individuals are designated as Project Directors. These Project Directors shall be responsible for the technical leadership and conduct of the project. All progress reports, completion reports and related correspondence shall be directed to the individuals so designated.

State Project Director

Name: Amy P. Smagula
Address: NH DES
29 Hazen Drive
Concord, NH 03301
Phone: 603 271-2248

Campus Project Director

Name: Alison Watts
Address: Gregg Hall
Colovas Road
Durham, NH 03824
Phone: 603 862-0585

F. Total State funds in the amount of **\$8,000** have been allotted and are available for payment of allowable costs incurred under this Project Agreement. State will not reimburse Campus for costs exceeding the amount specified in this paragraph.

Check if applicable

Campus will cost-share **0** % of total costs during the term of this Project Agreement.

Federal funds paid to Campus under this Project Agreement are from Grant/Contract/Cooperative Agreement No. _____ from _____ under CFDA# _____. Federal regulations required to be passed through to Campus as part of this Project Agreement, and in accordance with the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002, are attached to this document as Exhibit B, the content of which is incorporated herein as a part of this Project Agreement.

G. Check if applicable

Article(s) _____ of the Master Agreement for Cooperative Projects between the State of New Hampshire and the University System of New Hampshire dated November 13, 2002 is/are hereby amended to read:

H. State has chosen **not to take** possession of equipment purchased under this Project Agreement.
 State has chosen **to take** possession of equipment purchased under this Project Agreement and will issue instructions for the disposition of such equipment within 90 days of the Project Agreement's end-date. Any expenses incurred by Campus in carrying out State's requested disposition will be fully reimbursed by State.

This Project Agreement and the Master Agreement constitute the entire agreement between State and Campus regarding this Cooperative Project, and supersede and replace any previously existing arrangements, oral or written; all changes herein must be made by written amendment and executed for the parties by their authorized officials.

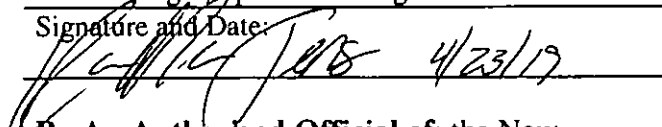
IN WITNESS WHEREOF, the University System of New Hampshire, acting through the **University of New Hampshire** and the State of New Hampshire, **NH Department of Environmental Services** have executed this Project Agreement.

**By An Authorized Official of:
University of New Hampshire**

Name: Karen M. Jensen

Title: Manager, Sponsored Programs Administration

Signature and Date:

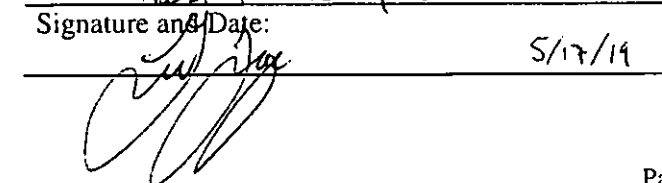
 4/23/19

**By An Authorized Official of: the New
Hampshire Office of the Attorney General**

Name: Gordon P. Landrigan

Title: Assistant Attorney General

Signature and Date:

 5/17/19

By An Authorized Official of:

NH Department of Environmental Services

Name: Robert R. Scott

Title: Commissioner

Signature and Date:

 5-15-19

**By An Authorized Official of: the New
Hampshire Governor & Executive Council**

Name:

Title:

Signature and Date:

EXHIBIT A

A. Project Title: Invasive Species Detection in Northeast Regional Lakes using Environmental DNA (eDNA)

B. Project Period: Upon G&C approval through December 31, 2020

C. Objectives: The University of New Hampshire (UNH), and staff from State agencies in the northeast will develop and conduct an eDNA sampling program for target invasive species in northeastern lakes. This project will provide proof of concept, and initial eDNA data for two invasive invertebrates; asian clam (*Corbicula fluminea*) and zebra mussel (*Dreissena polymorpha*). Both of these species are present in some areas of the region and are consider at risk of invading currently uninfected lakes. Improved early detection methods will support timely response and management actions. Specific objectives include:

- Validate eDNA methods for detecting invasive species (asian clam and zebra mussel) in Northeastern lakes.
- Develop initial recommendations on sample planning for these species including number and volume of samples, sample handling and best analytic methods.

D. Scope of Work: Task 1. Sampling plan and preparation

Sampling Plan. UNH will develop a sampling plan in coordination with staff from partner states. The plan will be reviewed by advisors from USGS who are also currently developing sampling programs for invasive species. UNH will provide expertise on the eDNA methods, but we rely on agency partners to advise on species biology. **Training.** UNH will provide protocols and training in sample collection and filtering for agency staff at selected sites. **Validation.** UNH will validate the methods discussed below on mussels and clams collected from New England lakes, to ensure that there is no regional genetic difference that interferes with the analysis.

Task 2. Sample collection and analysis

Collection. Samples will be collected and filtered by agency staff. Filters will be frozen and shipped to UNH for analysis. UNH will provide filters and shipping costs. **Analysis.** Samples will be extracted and analyzed at the UNH Hubbard Center for Genome Studies. Once the DNA is extracted the sample can be frozen and re-run for multiple analyses. Each sample will be analyzed by digital droplet PCR (ddPCR) using species-specific markers for asian clam and zebra mussels, as developed by Cowert et al. 2018 (*corbicula*) and by Gingera et al. 2017 (*dreissena*). The *dreissena* marker may not accurately differentiate between quagga and zebra mussels, if it important to make that distinction we can discuss adding an additional marker. We will also run a multi species metabarcoding primer (Klymus et al 2017) which is expected to detect both species, and will allow a comparison between the methods.

Task 3. Summarize results and develop recommendations

Based on the results of this pilot study we will develop recommendations for collecting and analyzing eDNA samples to detect asian clam and zebra mussels in northeast regional Lakes. This study will provide initial guidance for agencies, lake associations and others interested in early detection of invasive species. We do not expect to be able to develop regional statistical detection probabilities from this data set, but will provide foundation data for the types of lakes sampled in the study.

E. **Deliverables Schedule:** Task 1: June 1, 2019; Task 2: October 1, 2019; Task 3: December 1, 2019
Amy P. Smagula

F. **Budget and Invoicing Instructions:** Campus will submit invoices to State on regular Campus invoice forms no more frequently than monthly and no less frequently than quarterly. Invoices will be based on actual project expenses incurred during the invoicing period, and shall show current and cumulative expenses by major cost categories. State will pay Campus within 30 days of receipt of each invoice. Campus will submit its final invoice not later than 60 days after the Project Period end date. Note that this project is funded through a variety of grants or contracts from states beyond New Hampshire, and New Hampshire Department of Environmental Services has agreed to pay up to \$8,000 towards development of this method. The breakdown of payments below reflects the breakdown of this amount:

Budget Items	State Funding	Cost Sharing	(if required)	Total
1. Salaries & Wages	2,600	0		2,600
2. Employee Fringe Benefits	211	0		211
3. Travel	505	0		505
4. Supplies and Services	2,000	0		2,000
5. Equipment	0	0		0
6. Facilities & Admin Costs	2,684	0		2,684
Subtotals	8,000	0		8,000
In Kind Contribution		0		0
Total Project Costs:				8,000

EXHIBIT B

This Project Agreement is funded under a Grant/Contract/Cooperative Agreement to State from the Federal sponsor specified in Project Agreement article F. All applicable requirements, regulations, provisions, terms and conditions of this Federal Grant/Contract/Cooperative Agreement are hereby adopted in full force and effect to the relationship between State and Campus, except that wherever such requirements, regulations, provisions and terms and conditions differ for INSTITUTIONS OF HIGHER EDUCATION, the appropriate requirements should be substituted (e.g., OMB Circulars A-21 and A-110, rather than OMB Circulars A-87 and A-102). References to Contractor or Recipient in the Federal language will be taken to mean Campus; references to the Government or Federal Awarding Agency will be taken to mean Government/Federal Awarding Agency or State or both, as appropriate.

Special Federal provisions are listed here: None or **Uniform Guidance issued by the Office of Management and Budget (OMB) in lieu of Circulars listed in paragraph above.**

**Attachment A
Budget Estimate**

Budget and schedule:

Task	Budget	End Date
Task 1. Sampling plan and preparation, including lab validation	\$10,000	May 1 2019
Task 2. Sample collection and analysis (staff time)	\$5,000	Oct 1, 2019
Sample analysis (\$100/sample)	\$15,000	
Task 3. Summarize results and develop recommendations	\$5,000	Dec 1, 2019
Total (assuming 150 samples)	\$35,000	

NHDES will contribute \$8,000.00 towards this project. The remaining costs will be contributed by other partner states.