

PROJECT ANNOUNCEMENT

US Army Corps of Engineers (USACE) Engineer Research and Development Center (ERDC)

Title: Genetic characterization of introduced European frogbit and water soldier (*Hydrocharis morsus-ranae* and *Stratiotes aloides*) to support management and biological control development

Announcement Type: Initial Announcement

Funding Opportunity Number: W81EWF-23-SOI-0017

Assistance Listing Number: 12.630

Date Issued: 02 June 2023

Key Dates: Phase I announcement will be open to receive statements of interest continuously until 12:00 noon Central Time (CT), 03 July 2023, at which point all statements of interest must be received.

If invited to Phase II, full proposal applications will be due at 12:00 noon Central Time (CT), 02 August 2023.

Estimated Award Ceiling: \$100,000

Estimated Total Program Funding: \$200,000.00 Base year plus one option year.

Agency Contact: Kisha M. Craig, Kisha.M.Craig@usace.army.mil

I. Program Description

A. Short Description of Funding Opportunity

This agreement represents an opportunity to enter into a cooperative agreement for genetic characterization of populations of European frogbit and water soldier, two invasive aquatic weeds in North America, from populations in their invasive and native ranges.

B. Background

In the US, aquatic invasive plants cost millions of dollars annually in management and mitigation, requiring development of cost-effective strategies for preventing and dealing with their impacts. One species of particular concern is European frogbit (*Hydrocharis morsus-ranae*) due to the negative effects of infestations on recipient ecosystems. Similarly, water soldier (*Stratiotes aloides*) is an emerging invader in North America with similar predicted impacts as *H. morsus-ranae*. Herbicide and mechanical management programs may be viable in some cases; however, they can be detrimental to native flora, and cost prohibitive at scale. Biological control represents a potentially cost-effective tool for long-term sustainable management.

Hydrocharis morsus-ranae is an invasive nuisance species that forms large free-floating mats. Infestations impede water traffic, reduce water flow, displace native flora, contribute to hypoxic water conditions, and degrade recreational activities like swimming and fishing (Catling et al. 2003). Native to Europe and Northwest Asia, *H. morsus-ranae* escaped from a botanic garden in Ottawa, Canada in the 1930s, and has since spread throughout the Great Lakes states, as well as Vermont and Washington (Zhu et al. 2017; EDDMaps 2023). Current biological control efforts targeting *H. morsus-ranae* have been limited to generalist herbivores, including native snails and grass carp, but have only achieved limited success (Zhu et al. 2017). Classical biological control remains a potential tool, and several potential natural enemies have been identified from the native range (Weyl and Hinz 2022).

Stratiotes aloides is an emerging invasive weed in North America. The current distribution of *S. aloides* is limited to the Trent River in Ontario, Canada where it was detected in 2008 (USDA-APHIS 2017x). Impact of *S. aloides* are similar to those of *H. morsus-ranae*, with the added detriment of sharp serrated leaves that can cut those who come in contact with it (OFAH/OMNR 2012). Though little is known about the potential for the biological control of *S. aloides*, it often co-occurs with *H. morsus-ranae* within its native range, and due to the close phylogenetic relationship between the two species (Family: Hydrocharitaceae), it has been suggested that biological control surveys should include both (Weyl and Hinz 2022).

The USDA-APHIS has conducted a Weed Risk Assessment for both species and found a high likelihood that they will become serious invaders, with predicted distributions that include the entire eastern half of the contiguous United States (USDA-APHIS 2017a; 2017b). It is crucial in the early stages of biological control development to determine 1) genetic diversity of introduced populations, and 2) where introduced populations originated (i.e. from which regions were invasive populations introduced).

As biological control agents are developed, there are a series of important steps needed to maximize the likelihood that chosen agents will establish and be damaging to target infestations. First, source areas must be identified, through molecular matching, in order to direct exploration for agents. This is needed for both *H. morsus-ranae* and *S. aloides*. This step is especially important when plants have large native ranges because agents may be adapted to particular genotypes that can occur regionally. Concurrent with genetic assessments is the determination of genetic structure in the introduced range. Once source

populations are identified, exploration for natural enemies can be focused on regions and genotypes that have the greatest potential for success. This process requires detailed surveys of plant populations for damaging insect, pathogen agents, and phenology multiple times per year. Once agents are identified, they are prioritized and imported into quarantine where their biology is studied and evaluated for host-specificity.

C. Program Description/Objective: (brief description of the anticipated work)

Genetic characterization of *H. morsus ranae* and *S. aloides* populations in the invasive North American and native ranges is necessary to focus biological control surveys. This information will be used to direct future foreign exploration by identifying areas likely to have agents pre-adapted to the genotype of invasive North American populations.

Plant tissue samples will be collected by ERDC or partners through coordination with ERDC biologists. Samples will be collected in both the introduced (US, Canada) and native (Europe) ranges during surveys to locate damaging herbivorous insects and pathogens. Collection will include between 2-20 plants per population (usually waterbody), individually labeled, dried and preserved in silica gel for processing and analysis.

Sample analysis will need to be appropriate to objectives. DNA will be extracted from tissue samples and sequenced. Post-processing and interpretation of data with regards to genetic relationships among introduced populations and between introduced and native populations is required. Raw data will need to be available at the request of ERDC. An estimated 500-750 samples are anticipated for Year 1. This includes samples for *H. morsus-ranae* in the United States, Canada and Europe, and *S. aloides* in Canada and Europe.

D. Public Benefit

These data will benefit the public through informing overseas exploration of biological control agents for invasive *Hydrocharis morsus-ranae* and *Stratiotes aloides*. These invasive species impede beneficial uses of waterbodies, such as recreation, drinking water supply, as well as habitat for native flora and fauna. Biological control represents a cost-effective and sustainable tool for the management of invasive species, which can be integrated into existing management strategies long after the initial program phases are complete.

E. Authorization: 10 USC 4001

F. Legal Requirements

Each Cooperative Agreement awarded under this announcement will be governed by 2 CFR 200, “Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards”, 2 CFR 1100 Subchapter D—Administrative Requirements Terms and Conditions for Cost-Type Grants and Cooperative Agreements to Nonprofit and Governmental Entities and the DoD research general terms and conditions located at <https://www.nre.navy.mil/work-with-us/manage-your-award/manage-grant-award/grants-terms-conditions>.

G. Program-Specific Requirements

II. Federal Award Information

The following information applies to awards issued under this announcement:

- This is a new program
- The Government anticipates 1 Federal award from this announcement, but reserves the right to award more or less
- The total amount of funding expected to be awarded through this announcement is \$200K
- The expected amount of funding for each award is \$100K for Year 1, \$100K for Year 2.
- Award(s) from this announcement will be Cooperative Agreement(s)
- The anticipated period of performance is 2 years.
- Applications for renewal or supplementation of existing projects are eligible to compete with applications for new Federal awards
- The government reserves the right to accept only portions of an application and to negotiate with potential awardees
- Government's substantial involvement includes working cooperatively with the investigator to identify issues the protocol must address, develop field and training materials, and providing the awardee with field-collected samples. The Government may also assist in data analysis review and publication of results.

III. Eligibility Information

A. Eligible Applicants

This opportunity is restricted to non-federal partners of the Rocky Mountain or Great Lakes-Northern Forest Cooperative Ecosystems Studies Unit (CESU).

Disclosures of current and pending support made in this application may render an applicant ineligible for funding. Prior to award and throughout the period of performance, ERDC may continue to request updated continuing and pending support information, which will be reviewed and may result in discontinuation of funding.

Religious organizations are entitled to compete on equal footing with secular organizations for Federal financial assistance as described in E.O. 13798, "Promoting Free Speech and Religious Liberty."

B. Cost Sharing or Matching

This action will be 100% funded by USACE.

C. Conflict of Interest

a) General Requirement for Disclosure

You and your organization must disclose any potential or actual scientific or nonscientific conflict of interest(s) to us. You must also disclose any potential or actual conflict(s) of interest for any identified sub recipient you include in your application. We may have to ask you more questions if we need more information.

At our discretion, we may ask you for a conflict-of-interest mitigation plan after you submit your application. Your plan is subject to our approval.

b) Scientific Conflict of Interest

Scientific collaborations on research and development projects are generally the result of close collaboration prior to the submission of applications for support. Accordingly, these collaborations should be considered when considering potential conflicts of interest. The potential conflict is mitigated by the disclosure of these collaborations, and the list of current and pending support you provide for senior and key researchers. Therefore, you must include in your list of current and pending support all collaborators, even if they did not formally provide support.

D. Other

a) Licensure or Certification

You must include the Acknowledgment of Support and Disclaimer on all materials created or produced under our awards. This language may be found in the Terms and Conditions included in the award documents.

E. Certifications, representations, and assurances

1. To apply for grants and other funding opportunities the applicant entity must have an active registration in the System for Award Management (SAM). Applications will not be accepted through Grants.gov or other methods unless the entity is registered in SAM. Registration in SAM now includes the acceptance of Certifications and Assurances. See <https://www.grants.gov/web/grants/grantors/grantor-standard-language.html> for details on how to register in SAM, and Grants.gov
2. The Federal Assistance Certifications Report is an attestation that the entity will abide by the requirements of the various laws and regulations; therefore, as applicable, you are still required to submit any documentation, including the SF-LLL Disclosure of Lobbying Activities (if award value exceeds \$100,000.00), and, if applicable, informing DoD of unpaid delinquent tax liability or a felony conviction under any Federal law.
3. Certification Regarding Disclosure of Funding Sources. By checking "I

Agree" on the SF 424 (R&R) block 17 you agree to abide by the following statement: "By signing this application, I certify the proposing entity is in compliance with Section 223(a) of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 which requires that: (a) the PI and other key personnel certify that the current and pending support provided on the proposal is current, accurate and complete; (B) agree to update such disclosure at the request of the agency prior to the award of support and at any subsequent time the agency determines appropriate during the term of the award; and (c) the PI and other key personnel have been made aware of the requirements under Section 223(a)(1) of this Act. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. code, Title 218, Section 1001)."

IV. Application and Submission Information (2 Phase Process)

A. Phase I: Submission of Statement of Interest (SOI)

1. Materials Requested for Statement of Interest/Qualifications:

a. Please provide the following via e-mail attachment to: Kisha M. Craig, Kisha.M.Craig@usace.army.mil. (Maximum length: 2 pages, single-spaced 12 pt. font).

i. Name, Organization and Contact Information

ii. Brief Statement of Qualifications (including):

- Biographical Sketch,
- Relevant past projects and clients with brief descriptions of these projects,
- Staff, faculty or students available to work on this project and their areas of expertise,
- Any brief description of capabilities to successfully complete the project you may wish to add (e.g. equipment, laboratory facilities, greenhouse facilities, field facilities, etc.).

Note: A proposed budget is NOT requested at this time.

The administrative point of contact is Kisha M. Craig, Kisha.M.Craig@usace.army.mil.

2. ERDC will only accept SOIs submitted on or before 03 July 2023, 12:00 noon Central Time (CT).

Based on a review of the Statements of Interest received, an investigator or investigators will be invited to move to Phase II which is to prepare a full study proposal. Statements will be evaluated based on the investigator's specific experience and capabilities in areas related to the study requirements.

B. Phase II (if invited): Submission of Full Application Package

1. Address to Request Application Package

The complete funding opportunity announcement, application forms, and instructions are available for download at [Grants.gov](https://www.grants.gov).

The administrative point of contact is Kisha M. Craig, Kisha.M.Craig@usace.army.mil.

2. Content and Form of Application Submission

All mandatory forms and any applicable optional forms must be completed in accordance with the instructions on the forms and the additional instructions below.

- a. SF 424 R&R - Application for Federal Assistance
- b. Full Technical Proposal – Discussion of the nature and scope of the research and technical approach. Additional information on prior work in this area, descriptions of available equipment, data and facilities, and resumes of personnel who will be participating in this effort should also be included.
- c. Cost Proposal/Budget – Clear, concise, and accurate cost proposals reflect the offeror's financial plan for accomplishing the effort contained in the technical proposal. As part of its cost proposal, the offeror shall submit a full budget in sufficient detail so that a reasonableness determination can be made. A recommended template will be included in the invitation to Phase II. The SF 424 Research & Related Budget Form can be used as a guide but is required if the sub-recipient uses it. The cost breakdown should include the following, if applicable:
 1. Direct Labor: Direct labor should be detailed by level of effort (i.e. numbers of hours, etc.) of each labor category and the applicable labor rate. The source of labor rates shall be identified and verified. If rates are estimated, please provide the historical based used and clearly identify all escalation applied to derive the proposed rates.
 2. Fringe Benefit Rates: The source of fringe benefit rate shall be identified and verified.
 3. Travel: Travel costs must include a purpose and breakdown per trip to include destination, number of travelers, and duration.
 4. Materials/Equipment: List all material/equipment items by type and kind with associated costs and advise if the costs are based on vendor quotes and/or engineering estimates; provide copies of vendor quotes and/or catalog pricing data.
 5. Subrecipient costs: Submit all subrecipient proposals and analyses. Provide the method of selection used to determine the subrecipient.
 6. Tuition: Provide details and verification for any tuition amounts proposed.
 7. Indirect Costs: Currently the negotiated indirect rate for awards through the CESU is 17.5%.
 8. Any other proposed costs: The source should be identified and

verified.

d. R&R Senior/Key Person Profile

1. Biographical Sketch

2. Disclosure of Current and Pending Support:

- i. A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
- ii. Title and objectives of the other research projects.
- iii. The percentage per year to be devoted to the other projects.
- iv. The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other applications are awarded.
- v. Name and address of the agencies and/or other parties supporting the other research projects.
- vi. Period of performance for the other research projects.

e. SF-LLL Disclosure of Lobbying Activities (if award value exceeds \$100,000.00)

f. Data Management Plan:

A data management plan is a document that describes which data generated through the course of the proposed research will be shared and preserved, how it will be done, or explains why data sharing or preservation is not possible or scientifically appropriate, or why the costs of sharing or preservation are incommensurate with the value of doing so. See also: DoD Instruction 3200.12.

<https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/320012p.pdf?ver=2019-04-30-073122-220>

Data management plans are generally 2 pages in length, and must include the following considerations:

- (1) The types of data, software, and other materials to be produced.
- (2) How the data will be acquired.
- (3) Time and location of data acquisition, if scientifically pertinent.
- (4) How the data will be processed.
- (5) The file formats and the naming conventions that will be used.
- (6) A description of the quality assurance and quality control measures during collection, analysis, and processing.
- (7) A description of dataset origin when existing data resources are used.
- (8) A description of the standards to be used for data and metadata format and content.
- (9) Appropriate timeframe for preservation.
- (10) The plan may consider the balance between the relative value of data preservation and other factors such as the associated cost and administrative burden. The plan will provide a justification for such decisions.

3. ERDC will only accept full application packages submitted on or before 02 August 2023, 12:00 noon Central Time (CT).

4. Submission Instructions

Choose **ONE** of the following submission methods:

- a. E-mail:

Format all documents to print on Letter (8 ½ x 11”) paper. E-mail proposal to Kisha M. Craig, Kisha.M.Craig@usace.army.mil.

- b. Grants.gov: <https://www.grants.gov/>:

Applicants are not required to submit proposals through Grants.gov. However, if applications are submitted via the internet, applicants are responsible for ensuring that their Grants.gov proposal submission is received in its entirety.

All applicants choosing to use Grants.gov to submit proposals must be registered and have an account with Grants.gov. It may take up to three weeks to complete Grants.gov registration. For more information on registration, go to <https://www.grants.gov/web/grants/applicants.html>.

Organizations must have a Unique Entity Identifier (UEI) and active System for Award Management (SAM) registration to apply for Federal financial assistance.

- C. Application Withdrawal:

An applicant may withdraw an application at any time before award by written notice via email. Notice of withdrawal shall be sent to the agency point of contact identified in this announcement, and are effective upon receipt.

- D. Funding Restrictions

Per 2 CFR § 200.216, funds may not be used to procure telecommunications equipment or video surveillance services or equipment produced by

- Huawei Technologies Company,
- ZTE Corporation Hytera Communications Corporation,
- Hangzhou Hikvision Digital Technology Company,
- Dahua Technology Company
- any subsidiary or affiliate of such entities

Funds from an award may not be used to attain fee or profit.

V. Application Review Information

- A. Selection Criteria

Applications will be evaluated using the following criteria, listed in descending order of

importance:

- Technical merits of the proposed research and development; and
- Potential relationship of the proposed research and development to Department of Defense missions
- Any other criteria

B. Review and Selection Process:

Each application will be reviewed based on the selection criteria above rather than against other applications submitted under this Announcement.

Based on the Peer or Scientific Review, proposals will be categorized as Selectable or Not Selectable (see definitions below). The selection of the source for award will be based on the Peer or Scientific Review, as well as importance to agency programs and funding availability.

i. Selectable: Proposals are recommended for acceptance if sufficient funding is available.

ii. Not Selectable: Even if sufficient funding existed, the proposal should not be funded.

Note: The Government reserves the right to award some, all, or none of proposals. When the Government elects to award only a part of a proposal, the selected part may be categorized as Selectable, though the proposal as a whole may not merit such a categorization.

In addition to the technical/program review, the DoD performs a budget review and a risk review as directed by 2 CFR 200.206, including a review of the Federal Awardee Performance and Integrity Information System (FAPIIS). Applicants may review information in FAPIIS and comment on any information entered into that system. Comments made by applicants will be taken into account in addition to other information in considering applicants' integrity, business ethics, and record of performance.

VI. Federal Award Administration Information

The notification e-mail regarding a selection is not authorization to commit or expend DoD funds. A DoD grants officer is the only person authorized to obligate and approve the use of federal funds. This authorization is in the form of a signed Notice of Award. Applicants whose applications are recommended will be contacted by a DoD grants officer to discuss any additional information required for award. This may include representations and certifications, revised budgets or budget explanations, or other information as applicable to the proposed award. The award start date will be determined at this time.

VII. Reporting Requirements

The terms and conditions of the award will provide the specifics on how to submit the reports and any required sections for those reports.

In accordance with 2 CFR 200.328 (Financial Reporting) and 2 CFR 200.329 (Program Performance)

Report	Requirements/Form	Frequency	Means of Submission
ERDC Progress Report		Upon submittal of SF270	E-mail
Research Performance Progress Reports (Interim and Final)	OMB Control Number: 0704-0527	Annually	E-mail
Financial Report	SF 425	Quarterly	E-mail
Payment Report	SF 270	Quarterly	E-mail
Closeout Report		Once	E-mail

Awardees will need to comply with the reporting requirements in 2 CFR 170: Reporting Subaward and Executive Compensation Information.

The terms and conditions of the award will provide the specifics on how to submit the reports and any required sections for those reports.

VIII. Federal Contacts

Questions should be directed to:

Kisha M. Craig
Grants Specialist
Kisha.M.Craig@usace.army.mil

Chelsea M. Whitten
Grants Officer
Chelsea.M.Whitten@usace.army.mil

Questions regarding Grants.gov should be directed to: the toll-free number 1-800-518-4726 and email at support@grants.gov.

IX. Other Information

The Federal government is not obligated to make any Federal award as a result of the announcement. Only grants officers can bind the Federal government to the expenditure of fund.

Applicants are advised to monitor Grants.gov for potential amendments to this Notice of Funding Opportunity. You can also elect to be automatically notified by Grants.gov whenever there is a change to the opportunity.

Applications must not include any information that has been identified as classified national security information under authorities established in Executive Order 12958, Classified National Security Information.