

**Request for Statements of Interest
Funding Opportunity Announcement**

Federal Awarding Agency:

U.S. Army Corps of Engineers,
Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Funding Opportunity No: W81EWF-21-SOI-0006

CFDA No: 12.630

Statutory Authority: 10 USC 2358

Program Title: Investigations into diploid flowering rush (*Butomus umbellatus*) phenology

Announcement Type: Initial announcement

Issue Date: 9 December 2020

Statement of Interest/Qualifications Due Date: 11:59pm CST, 8 January 2021

Full Application Package Due Date, if Invited: 11:59pm CST, 15 February 2021

Estimated Award Ceiling: \$35,000.

Estimated Total Program Funding (optional): There is a possible award of \$105,000 over 3 years: \$35,000 per year.

Expected Number of Awards: The government expects 1 award from this announcement.

Section I: Funding Opportunity Description

Background:

In the US, management and mitigation of aquatic invasive plants cost millions of dollars annually, requiring development of cost-effective strategies for preventing and dealing with their impacts. Several species are of particular concern because of their potential or realized negative effects on recipient ecosystems, including the Eurasian weed, flowering rush (*Butomus umbellatus*). Flowering rush is a perennial monocot that has established in most northern tier states. It spreads and establishes in quiescent and flowing water systems where it can thrive as an emergent plant along shorelines (up to 1.3 m deep) and/or as a submersed plant in deeper waters (up to 6 m). Once established, flowering rush often forms monotypic stands (e.g., figure 1) that crowd out desirable native vegetation, limit recreational water use, reduce water flow, and impact native fish species.



Figure 1. Dense infestation of flowering rush in Oconto Falls, Wisconsin.

In the US, two flowering rush cytotypes are present: a sexually reproducing diploid cytotype, and an asexual, clonally-propagated triploid cytotype. Broad geographic

patterns of invasiveness (i.e., a species in one area seemingly is more aggressive than the same species in another area) may be explained by differences in plant origin (i.e., genetic lineage/ ploidy level), and observations throughout the introduced range of flowering rush suggest variable environmental and ecological tolerances related to ploidy level. Given that there are multiple introduced cytotypes of flowering rush, it is important to determine whether they display varying responses to management strategies.

Phenology is the study of the timing of important life history events within a species. Phenology studies can be used to understand seasonal variation in carbohydrate and biomass allocation to determine management strategies. No studies to date have targeted diploid flowering rush populations to better understand the biology of the invader. Although previous research by ERDC and USDA ARS has focused on phenology of the triploid cytotype in the Western US, flowering rush populations in the Great Lakes region are largely diploid. Therefore, phenology studies of diploid flowering rush field populations are needed.

Brief Description of Anticipated Work:

The objectives of the proposed effort include:

Objective 1: Develop study protocols to assess phenology of diploid flowering rush populations (Ant. Year 1).

Objective 2: Collect phenology data from diploid flowering rush sites, including monthly (or every 6 weeks) measurements on biomass allocation, starch allocation, reproductive output (Ant. Years 1-3).

Objective 3: Provide guidance using diploid flowering rush phenology to successfully manage populations in the US. (Ant. Year 3).

Description of proposed effort is as follows:

ERDC will partner with the USACE Buffalo District (LRB) and CESU vendor to complete this work. ERDC will be responsible for coordination of sample collection and shipping to the vendor at an interval to be determined at a later date (either every four or six weeks). Once sampling locations are confirmed, core samples will be collected every four to six weeks at up to three sites within a location. Samples will be collected with a coring device by ERDC or a local partner and consist of above and belowground plant material to be processed by the vendor. The vendor will receive up to 180 samples (20 samples x 3 sites x 3 locations) at every sampling date, up to six sampling dates per year for a possible total of 1,080 samples per year.

The vendor will be responsible for processing the samples to obtain biomass and starch

allocation data, similar to the following (this protocol will be finalized upon discussion with the vendor):

- **Wash and separate samples.** Samples will be washed of debris and sediment, then separated into above (leaves), below_{Ro} (roots), below_B (bulbils), below_{Rh} (rhizomes) parts.
- **Count rhizome buds and bulbils.** The vendor will enumerate the number of rhizome buds and/or bulbils present in each sample. If the number of bulbils is large (e.g., >100 per sample), the vendor may take a subsample, calibrate by weight to estimate total bulbils per sample.
- **Dry and weigh parts.** The vendor will dry all samples in an oven at 50-70°C, then determine biomass.
- **Starch analysis.** The vendor will conduct starch/carbohydrate analysis on all plant parts for all samples. Starch analysis can be conducted a number of ways, the vendor can choose the method that is common to their laboratory.
- **Send left-over sample material.** Remaining dried plant material will be provided to ERDC for further processing.

Although ERDC will contribute to data analysis and reporting, the vendor will provide interpretation of biomass and starch content results. ERDC and the vendor will collaborate to draft a guidance document to inform management of flowering rush informed by phenological data.

Site Location:

The majority of this effort is expected to occur at the vendor's laboratory or at field sites, to be determined in coordination with ERDC, the CESU vendor, and USACE Buffalo District (LRB). Three study locations have been tentatively chosen: Mentor Marsh, City of Cleveland, OH; Ottawa National Wildlife Refuge, City of Toledo, OH; Unity Island Restoration Area, City of Buffalo, NY (Figure 1). ERDC will be responsible for engaging local cooperators for sample collection and site access.

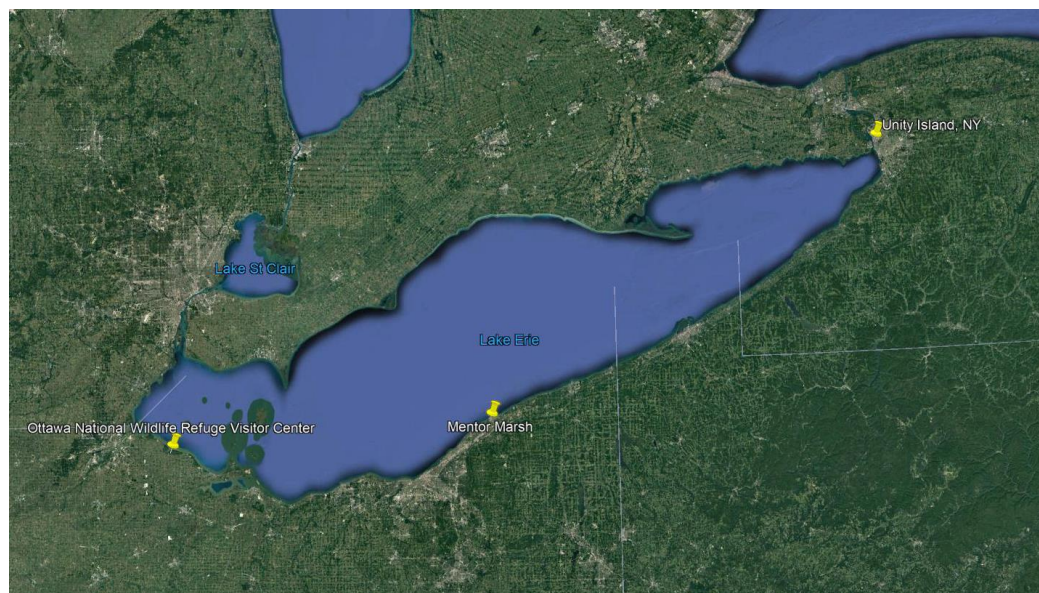


Figure 1. Map with potential diploid flowering rush phenology study sites.

Public Benefit:

These data will benefit the public through development of effective management tools for the invasive aquatic plant *Butomus umbellatus*. Effective management is necessary to mitigate environmental and economic impacts caused by *B. umbellatus* invasion and to create long-term sustained control for beneficial uses of waterbodies, such as recreation, drinking water supply, and flora and fauna habitat, long after the initial program phases are complete.

Section II: Award Information

Responses to this Request for Statements of Interest will be used to identify potential investigators for studies to be sponsored by the Engineer Research and Development Center to provide guidance on using diploid flowering rush phenology to efficiently and effectively control flowering rush. The estimated level of funding for FY21 is approximately \$35,000. Additional funds of \$35,000/year for 2 additional years may be available, providing the potential funding of \$105,000 over 3 years to the successful Recipient/Awardee.

Government Involvement:

The Government will work cooperatively with the investigator to identify issues the protocol must address, develop field and training materials, experimental design and

coordinate sample collection and shipping. The Government will also assist in data analysis review and writing journal articles.

Section III: Eligibility Information

1. Eligible Applicants – This opportunity is restricted to non-federal partners of the Great Lakes- Northern Forest Cooperative Ecosystems Studies Unit (CESU).
2. Cost Sharing – This action will be 100% funded by USACE.

Section IV: Application and Submission Information – Two Phase Process

Phase I: Submission of a Statement of Interest/Qualifications.

1. Materials Requested for Statement of Interest/Qualifications:
 - a. Please provide the following via e-mail attachment to:
Kisha.M.Craig@usace.army.mil
(Maximum length: 2 pages, single-spaced 12 pt. font).
 1. Name, Organization and Contact Information
 2. 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 Craig, 601-634-5397;
Kisha.M.Craig@usace.army.mil

2. Statement of Interest/Qualifications shall be submitted NO LATER THAN 11:59pm CST, 8 January 2021

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.

Phase II: Submission of a complete application package to include a full technical proposal including budget, if invited.

1. Address to Request Application Package

The complete funding opportunity announcement, application forms, and instructions are available for download at Grants.gov.

The administrative point of contact is Kisha Craig, 601-634-5397;
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 cost element breakdowns in sufficient detail so that a reasonableness determination can be made. The SF 424 Research & Related Budget Form can be used as a guide. 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.
3. Application package shall be submitted NO LATER THAN 11:59pm CST, 15 February 2021
4. Submission Instructions
Applications may be submitted by e-mail, or Grants.gov. 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@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>.

Section V: Application Review Information

1. **Peer or Scientific Review Criteria:** In accordance with DoDGARs 22.315(c), an impartial peer review will be conducted. Subject to funding availability, all proposals will be reviewed using the criteria listed below (technical and cost/price). All proposals will be evaluated under the following two criteria which are of descending importance.
 - a. **Technical (items i. and ii. are of equal importance):**
 - i. Technical merits of proposed R&D.
 - ii. Potential relationship of proposed R&D to DoD missions.
 - b. **Cost/Price:** Overall realism of the proposed costs will be evaluated.

2. Review and Selection Process

a. **Categories:** 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.

b. No other criteria will be used.

c. Prior to award of a potentially successful offer, the Grants Officer will make a determination regarding price reasonableness.

Section VI: Award Administration Information

1. Award Notices

Written notice of award will be given in conjunction with issuance of a cooperative agreement signed by a Grants Officer. The cooperative agreement will contain the effective date of the agreement, the period of performance, funding information, and all terms and conditions. The recipient is required to sign and return the document before work under the agreement commences. **Work described in this announcement SHALL NOT begin without prior authorization from a Grants Officer.**

2. Administrative Requirements

The cooperative agreement issued as a result of this announcement is subject to the administrative requirements in 2 CFR Subtitle A; 2 CFR Subtitle B, Ch. XI, Part 1103; and 32 CFR Subchapter C, except Parts 32 and 33.

3. Reporting

See 2 CFR Sections 200.327 for financial reporting requirements, 200.328 for performance reporting requirements, and 200.329 for real property reporting requirements.

Section VII: Agency Contact

Kisha Craig, Grants Specialist

US Army Corps of Engineers, Engineer Research and Development Center

3909 Halls Ferry Road

Vicksburg, MS 39180-6199

Kisha.M.Craig@usace.army.mil

601-634-5397