

**Texas AgriLife Extension Service  
Texas Water Resources Institute**

Quarterly Progress Report

**Water Quality at Caddo Lake  
Center for Invasive Species Eradication: Caddo Lake Giant Salvinia Eradication Project  
USDA NRCS Agreement #: 68-7442-10-499**

Quarter No. 8 From: 4.01.2012 Through: 6.30.2012

**Abstract:**

The **Center for Invasive Species Eradication** (CISE) has continued operations this quarter. The focus of operations has been expanding production of weevils at the Caddo Lake NWR weevil rearing facility, the continued evaluation of cold tolerance of the salvinia weevil in a laboratory setting, expanding efforts to better understand weevil population growth and plant biomass impacts and resuming chemical evaluations. Experiments to evaluate weevils from south Florida, southern Louisiana, north Texas and Australia were completed and data assessments are underway.

Considerable efforts to directly treat giant salvinia on Caddo Lake have occurred this quarter. On May 22 and 23, the first large scale weevil release was completed. An estimated 31,300 adult weevils and countless larvae and eggs were released in the northern part of the lake. Additionally, a private contractor has completed the application of chemicals to approximately 696 acres of giant salvinia. This treatment occurred in the Clinton Lake portion of Caddo during May and June and targeted the biggest infestation of giant salvinia on the lake. Significant quantities of giant salvinia remain.

Education and outreach continues to be a focus of the project this quarter. The giant salvinia and salvinia weevil rearing manual that describes multiple approaches and lessons learned in rearing salvinia weevils has been completed and is currently in the process of being published. Information on the project and how to combat giant salvinia was delivered at 11 educational programs attended by 668 individuals.

**Overall Progress and Results by Task:**

**Task 1. Project Administration: Texas Water Resources Institute**

**Subtask 1.1:** *Establish a Center for Invasive Species Eradication at Texas A&M University under the administrative leadership of Texas AgriLife Research and Texas AgriLife Extension Service to utilize funds provided through USDA Natural Resources Conservation Service to focus research and Extension educational programs on controlling invasive plant species.*

This action has been completed and the Center for Invasive Species Eradication is fully operational with personnel at TWRI handling day to day management activities.

#### **Task 100% Complete**

***Subtask 1.2:*** *Provide fiscal oversight of funds, make funds allocations to scientists and Extension personnel, establish contracts and subcontracts as necessary, perform accounting functions*

Fiscal management is being carried out by TWRI personnel. Budgets and planned expenditures are continually being monitored to ensure that expenses are within the scope of the project and within the available budget.

As of July 2, 2012 a total of \$376,649 has been spent on the project. Another \$88,880 is currently encumbered and will be spent this fiscal year.

#### **Task 60% Complete**

***Subtask 1.3:*** *Facilitate project and program discussions between AgriLife Research and Extension administration and NRCS administrative personnel to ensure that programmatic goals and objectives are met in a timely manner through this project.*

Work for this task has continued.

#### **Task 75% Complete**

### **Task 2. Project Coordination: Texas Water Resources Institute and other Agencies**

***Subtask 2.1:*** *Coordinate and facilitate meetings among project personnel to ensure research focus, maximum collaboration, educational programs and transfer of information*

Coordination and communication amongst project personnel has continued this quarter with the focus being on enhancing weevil rearing capacity at Caddo Lake NWR, improving on-lake evaluation methods and initiating chemical trials this year.

#### **Task 75% Complete**

***Subtask 2.2:*** *Work with groups currently engaged in controlling Giant Salvinia and other invasive species to foster collaboration and information transfer on the state of the science in controlling Giant Salvinia. These groups include those participating in the Interagency Giant Salvinia Control Team, including the Caddo Lake Institute, Cypress Valley Navigation District, East Texas Baptist University, Northeast Texas Municipal Water District, Northwestern State*

*University, Louisiana Dept. of Fish and Wildlife, Louisiana State University, Texas AgriLife Research, Texas AgriLife Extension Service, Texas Parks and Wildlife Dept., USDA Agricultural Research Service, Animal & Plant Health Inspection Service, Natural Resource Conservation Service, US Army Corps of Engineers, Engineer Research & Development Center and Lewisville Aquatic Ecosystem Research Facility, and US Fish and Wildlife Service*

Interagency communication continued this quarter with the focus being on coordinating both biological and chemical treatments on Caddo Lake. With weevil releases and large scale chemical applications underway, communication remains critical.

#### **Task 75% Complete**

***Subtask 2.3:*** *Work with project personnel to meet reporting requirements and to produce effective project publications*

The document titled “A Guide to Mass Rearing the Salvinia Weevil for Biological Control of Giant Salvinia” was completed and submitted for editing and formatting.

#### **Task 75% Complete**

### **Task 3. Chemical Treatment and Evaluation: Texas AgriLife Research and Extension**

***Subtask 3.1:*** *Researchers and Extension Specialists will work with others to establish chemical treatment research and demonstration sites to the extent possible at Caddo Lake for Giant Salvinia control. (Killing Giant Salvinia at Caddo Lake is the primary focus; as such, demonstrations at private or isolated locations may be required for research demonstrations of chemical treatment combinations)*

On-lake chemical demonstrations will begin following completion of the small-scale chemical trials conducted in Subtask 3.2. An area on the lake has been identified for conducting these small scale trials.

#### **Task 40% Complete**

***Subtask 3.2:*** *Test and evaluate chemical treatment practice alternatives for controlling Giant Salvinia at Caddo Lake using a variety of chemicals, surfactants, and combinations at various concentrations and timings (This may include contracting with local or private chemical applicators to chemically treat Caddo Lake)*

Small-scale chemical trials have resumed this quarter at Caddo Lake NWR. Preliminary data should be available next quarter on chemical efficacy.

#### **Task 60% Complete**

***Subtask 3.3:*** Evaluate the efficacy and cost effectiveness information of each treatment scenario

Action will resume on this task following completion of small-scale chemical trials.

#### **Task 25% Complete**

***Subtask 3.4:*** Work with personnel in Task 4 to evaluate the efficacy of utilizing chemical treatments in concert with biological control

Plans continue to be refined for evaluating using biocontrol and chemical control in conjunction with each other. Lab based evaluations will be initiated next quarter.

#### **Task 20% Complete**

### **Task 4. Biological Treatment and Evaluation: Texas AgriLife Research and Extension**

***Subtask 4.1:*** Collaborate with other agencies and groups to setup new studies and cooperate in ongoing research and Extension educational programs dealing with biological strategies for controlling Giant Salvinia at Caddo Lake; practices which can be utilized for public and private lands statewide (If needed, research and demonstration sites away from Caddo Lake will be utilized as quickly killing Giant Salvinia at Caddo Lake is the priority)

Experiments on cold tolerance of populations of salvinia weevil from Florida, Louisiana, Texas and Australia were completed and data are being summarized.

A small plot, replicated study was initiated at Caddo Lake and Lake Steinhagen to more closely determine weevil population growth and impact on plant biomass. Also, weevil density and salvinia biomass were monitored in a large area release site on Lake Steinhagen in cooperation with Texas Parks and Wildlife.

#### **Task 75% Complete**

***Subtask 4.2:*** Work with TPWD and local Caddo Lake agencies, organizations and individuals to enhance weevil rearing capabilities for use at Caddo Lake

Rearing tanks were managed to support adult weevil reproduction, larval growth and subsequent emergence of first generation adults. By late May, sufficient numbers of adults were present and salvinia containing adults and immature stages were harvested from three tanks and released into the field.

The three harvested tanks were cleaned, refilled with lake water and re-infested with salvinia and weevil larvae to initiate a second generation of adults. Water quality is being monitored weekly to ensure optimum growing conditions

### **Task 92% Complete**

**Subtask 4.3:** *Coordinate with USACE's Lewisville Aquatic Ecosystem Research Facility to collaborate in ongoing efforts, transfer knowledge and expand their operations*

AgriLife Extension personnel maintain routine contact with LAERF personnel regarding weevil rearing and release methodologies. USACE-LAERF personnel are participating in the development of the "Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia."

### **Task 75% Complete**

**Subtask 4.4:** *Evaluate improved methods of rearing weevils, harvesting weevils, delivering weevils to infested areas in Caddo Lake and various timing options of weevil applications in Caddo Lake to determine the most effective biological treatment scenarios to employ to the extent possible; as indicated earlier, killing Giant Salvinia at Caddo Lake may result in the need for research demonstration sites in the vicinity of Caddo Lake.*

The document titled "A Guide to Mass Rearing the Salvinia Weevil for Biological Control of Giant Salvinia" was completed and submitted for editing and formatting.

Salvinia containing an estimated 31,300 adult weevils and associated larvae and eggs was collected from the three rearing tanks and released at the Bird Roost release site on Caddo Lake on May 22-23. Personnel from the Cypress Valley Navigation District and Gecko Pest Control assisted with the release. An adjacent area was established as a control site and no weevils were released at this site.

On June 20, salvinia plants were collected from 16 locations within the release site and at 16 sites in the adjacent control site at Bird Roost. In the release site, salvinia weevil adults were recovered from one-third of the locations and averaged 2.6 adults/kg of salvinia. Weevils were reproducing at this site as weevil larvae were present at one-fourth of the sites. There were as yet no differences in plant biomass or area covered by salvinia between the release and check sites. This sampling will be repeated at monthly intervals.

Improved water quality monitoring is being implemented to improve rearing efficiency.

### **Task 85% Complete**

***Subtask 4.5: Assess practice efficacy and cost effectiveness of utilizing weevils in the control of Giant Salvinia***

An initial cost assessment for producing weevils as a biological control of giant salvinia has been completed and is included in “A Guide to Mass Rearing the Salvinia Weevil for Biological Control of Giant Salvinia” that is currently being published. Further assessment will be summarized toward the end of the project in a formal report.

**Task 30% Complete**

***Subtask 4.6: Use information gleaned from demonstration sites to develop biological treatment recommendations and guidelines for use of weevils to treat Giant Salvinia in infested areas***

No activity to report at this time.

**Task 0% Complete**

***Subtask 4.7: Work with personnel in Task 3 to evaluate the efficacy of utilizing chemical treatments in concert with biological control***

Plans continue to be refined for evaluating using biocontrol and chemical control in conjunction with each other. Lab based evaluations will be initiated next quarter.

**Task 20% Complete**

**Task 5. Other Treatment: All involved agencies**

***Subtask 5.1: Work with federal, state and local agencies as well as local entities and individuals to evaluate the feasibility, efficacy and cost effectiveness of utilizing other treatment options (hydrological, mechanical, others) for controlling Giant Salvinia***

No action to report this quarter.

**Task 40% Complete**

***Subtask 5.2: Convert feasible options into treatment practice descriptions to include in recommended treatment strategies and guidelines***

No new activity to report this quarter.

**Task 30% Complete**

**Subtask 5.3:** *Develop treatment prescriptions suitable for inclusion in NRCS FOTGs, Extension printed materials and other guides for treating Giant Salvinia; these will take the form of job sheets, fact sheets, supplements to conservation practice standards and technical brochures.*

The document titled “A Guide to Mass Rearing the Salvinia Weevil for Biological Control of Giant Salvinia” was completed and submitted for editing and formatting.

Tri-fold “The Pond Destroyers: Common and Giant Salvinia” continues to be distributed at Extension meetings.

#### **Task 50% Complete**

### **Task 6. Education and Outreach: Texas AgriLife Extension Service and Texas Water Resources Institute**

**Subtask 6.1:** *Extension and TWRI will work with TPWD and other agencies to enhance existing outreach and education efforts through the use of news releases, TV spots, demonstrations, and other communications focused on prevention of spread and control methods for Giant Salvinia*

Project personnel conducted eleven educational programs with 668 attendees. Giant salvinia information was distributed and its invasiveness and spread in Texas discussed. A student presentation on the research into the utilization of triploid grass carp to control giant salvinia will be presented as a Student Paper at the Aquatic Plant Management Society meeting in Salt Lake City, Utah in July.

#### **Task 70% Complete**

**Subtask 6.2:** *Identify and secure partnerships with local, state, regional and national organizations (ex: B.A.S.S., fishing and hunting guides, cities, water sports manufacturers, Ranger Boats, Evinrude, Mercury, others) to expand the dissemination of educational materials on Giant Salvinia*

No new activity to report this quarter.

#### **Task 20% Complete**

**Subtask 6.3:** *Develop and host CISE website for invasive species eradication information and as an outlet for information dissemination*

Website development is complete and provides links to numerous information outlets. Content is continually being added to the site. In addition, a Facebook page and online blog are updated as new information is ready to be presented. All pages are advertised to the public when the opportunity is available.

CISE Web address: <http://cise.tamu.edu/>  
Project Web address: <http://cise.tamu.edu/caddo>  
Project blog: <http://caddosalvinia.blogspot.com/>  
Facebook page: link can be found on the above blog.

### **Task 93% Complete**

#### ***Subtask 6.4: Facilitate education and outreach efforts and support media relations***

Media coverage has picked up as giant salvinia levels increase on the lake. A news release is being coordinated with the next giant salvinia weevil release.

### **Task 65% Complete**

#### **Task 7. GIS Support: Texas AgriLife Research**

##### ***Subtask 7.1: Texas AgriLife Research will provide GIS support for all aspects of the project and develop maps illustrating project activities and demonstration locations***

CISE project personnel continue to document treatment and research activities using GPS when needed.

### **Task 45% Complete**

#### **Task 8. Include Treatment Scenarios in Agency Guidelines: All Agencies**

##### ***Subtask 8.1: Using information gleaned from this project, develop detailed strategies and practices for control of Giant Salvinia for inclusion in agency guidelines such as NRCS FOTGs, Extension bulletins and factsheets, TPWD outreach information and other agency materials for utilization in both private and public water bodies***

Work continues on the "Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia." This document provides a complete current state of knowledge for raising salvinia weevils under different scenarios.

### **Task 50% Complete**

##### ***Subtask 8.2: Work closely with NRCS and other agencies to disseminate the control practices for Giant Salvinia as appropriate***



“The Pond Destroyers: Common and Giant Salvinia” continues to be distributed at Extension meetings.

### **Task 60% Complete**

#### **Planned Activities for Next Quarter:**

- continue cold tolerance studies in the lab
- continue small scale chemical trials at the Caddo Lake NWR
- initiate on-lake chemical trials to evaluate effectiveness of differing combinations in a lake setting
- when published, distribute the “Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia” via online avenues
- continue to monitor weevil release sites and release additional weevils as they are available
- continue coordination with CVND and TPWD on spraying

**Lee Eisenberg, TWRI’s CISE Extension Assistant removes weevil infested salvinia from the weevil tanks for distribution on Caddo Lake.**

