

**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. 7 From: 1.01.2012 Through: 3.31.2012

Abstract:

The **Center for Invasive Species Eradication (CISE)** has continued operations this quarter with the continuing focus being on evaluating cold tolerance of the salvinia weevil in a laboratory setting. Experiments were initiated and are underway to determine the amount of time salvinia weevils can survive freezing temperatures. This study will evaluate weevils from a variety of locations including south Florida, southern Louisiana, north Texas and Australia. Additionally, overwintering studies were conducted in conjunction with TPWD at B.A. Steinhagen Reservoir to evaluate temperatures at which salvinia weevils begin to reproduce in the spring.

Education and outreach continues to be a focus of the project this quarter. Work has continued on developing a giant salvinia and salvinia weevil rearing manual that describes multiple approaches and lessons learned in rearing salvinia weevils. This document is currently in the review process and will be completed next quarter and published as an online technical report. Additionally, information on the project and how to combat giant salvinia was delivered at numerous landowner educational events and were attended by 693 individuals.

On March 2nd, Mr. Lee Eisenberg began his employment at the CISE Extension Assistant located at the Caddo Lake National Wildlife Refuge. Lee is a recent graduate of the LSU Entomology department where he was awarded his Masters of Science degree. Lee brings with him extensive knowledge of giant salvinia biological control and rearing techniques. Lee will be an invaluable resource for the project and will work to support the integrated giant salvinia control efforts on Caddo Lake.

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 February 29, 2012 a total of \$264,485 has been spent on the project. Another \$134,381 is currently encumbered and will be spent this fiscal year.

Task 50% 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 65% 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 have been critical this quarter as efforts to hire a replacement Extension Assistant and get them up to speed on project activities, roles and responsibilities are all underway. These efforts will continue next quarter as the growing season ramps up.

Task 65% 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

Project personnel have maintained contact with personnel from numerous agencies this quarter. Coordination between CVND, CLI and TPWD has been paramount this quarter as planning for biological and chemical control to take place in the spring and summer of 2012 is underway.

Task 65% Complete

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

The “Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia” continues its way through the review process. Plans have been made to publish this manual as an online document and a print document.

Task 65% 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)*

No activity to report during this quarter as winter temperatures have largely suppressed giant salvinia growth. Plans will be made for on-lake demonstrations to begin in the Spring and Summer of 2012.

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)*

Planning is underway for the 2nd round of chemical trials to commence in the coming quarter.

Task 45% Complete

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

No new activity to report as chemical trials were suspended for the winter.

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

Planning is underway to devise an experimental approach that will evaluate the ability to utilize biological and chemical controls simultaneously.

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)

Overwintering studies continued this quarter at B.A. Steinhagen Reservoir in conjunction with TPWD. This population was established last year during the record drought and is being utilized as a means to evaluate when weevil reproduction begins in the spring.

Cold tolerance studies continued this quarter the climatic conditions that salvinia weevils can survive thus elucidating the approximate areas of the state where salvinia weevils can be effectively deployed as a control agent. Studies were also initiated to evaluate the ability of different weevil populations to begin laying eggs at cold temperatures since this characteristic determines when reproduction begins in the spring.

The Bird Roost release site was sampled in February and live adult weevils were recovered producing the first documented case of salvinia weevils overwintering at

Caddo Lake. Other sites will be sampled early next quarter to see if weevils survived the drought.

Task 65% 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*

Weevil rearing capabilities continue to be refined as do production and weevil delivery methods. Coordination amongst entities actively engaged in weevil production remains strong and will further improve weevil rearing capabilities at Caddo Lake and in other locations as well.

Task 90% 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 65% 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.*

Effective methods for rearing, harvesting, and delivering weevils to Caddo Lake have been established and implemented. These methods are being described in the "Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia" and will be further refined as more information is learned.

Further, methods to utilize chemical treatments in concert with biological control are being planned as a means to improve the effectiveness of giant salvinia control.

Task 80% Complete

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

Work has continued to develop a cost benefit analysis for using weevils as a biological control of giant salvinia. This information 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

Planning is underway to evaluate the use of biological control in concert with chemical controls and will be implemented during the 2012 growing season. This evaluation will begin with small container treatments then move to larger on-lake trials later this year.

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 formal evaluations were conducted this quarter; however, observational evidence noted during the drought indicating that giant salvinia quickly recovered and began growing once a fresh influx of water arrived at the lake. This suggests that extended drying with roots fully removed from water sources is required to kill the plant; however, it is highly unlikely that all giant salvinia will be killed.

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.*

Giant salvinia treatment recommendations are included on the AQUAPLANT website at: <http://aquaplant.tamu.edu> and noted in the “Salvinias: The Pond Destroyers” tri-fold.

The “Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia” continues its development and will present a current state of knowledge on growing salvinia weevils for biological control of giant salvinia.

Task 40% 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*

The project website, blog, and facebook page continue to be updated periodically with information as it becomes available. Project personnel have conducted six educational programs of Extension clientele across the state on pond and aquatic vegetation management. 693 attendees participated in these events.

Task 60% 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 92% Complete

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

Media interactions have been few and far between this fall as giant salvinia problems on the lake have been minimized due to the drought.

Task 60% 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 supported by the Texas A&M Institute of Renewable Natural Resources discussed ideas with Caddo Lake Institute (CLI) personnel regarding a GIS based tracking tool that will help coordinate giant salvinia control efforts on Caddo and other lakes. CLI secured funding from external sources to complete this work; however, the project team will continue to coordinate with this effort to provide input as needed.

Task 35% 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” trifold has been distributed to Extension Fisheries Specialists for use in pond management programs. This trifold will be further distributed as other avenues present themselves.

Task 50% Complete

Planned Activities for Next Quarter:

- conduct project team coordination meeting to plan out activities for the 2012 growing season
- continue cold tolerance studies in the lab
- resume small scale chemical trials at the Caddo Lake NWR
- initiate on-lake chemical trials to evaluate effectiveness of differing combinations in a lake setting
- finalize and publish online the “Guide to Mass-Rearing Salvinia Weevils for Biological Control of Salvinia”
- continue to monitor weevil release sites and release additional weevils as they are available
- continue coordination with CVND and TPWD on spraying
- initiate large scale treatment of giant salvinia on Caddo Lake