

**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. 3 From: 1.01.2011 Through: 3.31.2011

Abstract:

The **Center for Invasive Species Eradication** (CISE) has continued operations this quarter with the primary focus being on conducting research activities to advance the knowledge on biological control of giant salvinia. With the weevil rearing facility operational, research began to evaluate temperature thresholds when weevils die off in the winter, when they begin laying eggs in the spring and when larvae emerge. This will help in better timing weevil releases on the lake in the future.

Developing specific plans for on-lake treatments in the coming growing season were a primary focus this quarter. A spray coordination meeting was conducted with local and state entities to ensure needed lines of communication are established for the application of biological and chemical controls during the 2011 growing season. A meeting of the Inter-Agency Giant Salvinia Control Team has also been set for April 7th to discuss the current state of giant salvinia control efforts in the southern U.S.

Refining the weevil rearing process has been a significant task this quarter as well. Well water initially utilized in the weevil tanks was replaced with Caddo Lake water to facilitate better giant salvinia growth. Solar screen was purchased and will be installed on the greenhouses next quarter to prevent UV damage to the plants and overheating in the green houses. Weevil densities have been closely monitored this spring in an effort to properly time the first large scale weevil release; this release is anticipated to occur in late April or early May. An initial small-scale release was conducted March 31st with about 1,500 weevils being released.

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 March 3, 2011 a total of \$120,582 dollars have been spent on the project. Another \$57,223 are currently encumbered and plans are made to expend approximately \$200,000 additional dollars this year.

Task 25% 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. TWRI coordinated with NRCS to amend the project's budget this quarter to better meet the goals and objectives of the project.

Task 25% 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 cooperation with other agencies is ongoing. A meeting in late January was held between project personnel to discuss plans for this growing season. Numerous phone calls have also taken place this quarter to facilitate the initiation of new studies and implementation of established plans.

Task 45% 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 been making contact with personnel from most of the agencies/entities listed above. Additionally, CISE project personnel have worked with Howard Elder at TPWD on Giant Salvinia management options and plans for 2011. Coordinating with Russell Castro with NRCS to develop and publish a landowner guide to Giant Salvinia and its control. Project personnel coordinated a meeting between Drs. Paul Baumann, Mike Masser and LeeAnn Glomski (with LAERF) to develop chemical trial protocols on herbicides and surfactants for control of Giant Salvinia.

A meeting with the Inter-Agency Giant Salvinia Control Team has been planned for the next quarter and will allow project personnel to engage with other entities involved in similar efforts. Collaboration with other agencies is ongoing and will increase as Caddo Lake CISE efforts accelerate.

Task 40% Complete

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

Work on this task was initiated this quarter. Project personnel have been coordinating with Russell Castro with NRCS to develop and publish a landowner guide to Giant Salvinia and its control. Summary documents have been revised this quarter to better describe the efforts of the project and will be distributed at public meetings and events. Additional educational publications will be developed when sufficient information has been gleaned to produce new publications.

Task 20% 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)*

Planning is ongoing for small-scale and plot-scale, on-lake chemical demonstrations during the 2011 growing season. Logistics for each of these are being sorted out at this time and trials should begin soon.

Task 25% 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)*

Project personnel have coordinated a meeting between Dr. Paul Baumann and LeeAnn Glomski (with Lewisville Aquatic Ecosystem Research Facility) to develop chemical trial protocols on herbicides and surfactants for control of Giant Salvinia. LAERF submitted a proposal to conduct this work.

In addition, a draft bid request to hire a private spray contractor was drafted in order to accomplish herbicide applications for giant salvinia on Caddo Lake during the 2011 growing season. Language on this bid is being reviewed and will be completed next quarter.

Task 15% Complete

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

No activity to report at this time.

Task 0% Complete

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

No activity to report at this time.

Task 0% 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)*

AgriLife Extension is leading the efforts in researching the salvinia weevil. Extension has worked closely with personnel at LAERF, USDA ARS, LSU Ag Center, TPWD and others to glean as much information as possible on salvinia weevils. Current research efforts are evaluating the ability of salvinia weevil to tolerate cold temperatures as well as the date and temperature in which weevil egg-laying and larvae development occur on Caddo Lake and in the weevil rearing tanks. Meetings of CISE personnel and LSU faculty engaged in giant salvinia/weevil research is planned for the second quarter of 2011. Further studies and educational programs will be devised as the first salvinia growing season of the project continues.

Task 30% 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 (This may include contracting with local or private entities to expedite the delivery of weevils to infected areas)*

The Caddo Lake Institute, Extension, TPWD, TWRI and local volunteers have worked very closely to complete the primary infrastructure for the weevil rearing facility. Local individuals have responded positively to volunteer requests for assistance in weevil releases on Caddo Lake. It is expected that volunteer assistance will play a major role in the first weevil release tentatively scheduled for late April. The weevil rearing facility is now fully operational and its operations will be refined over the duration of the project.

Task 80% 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. Several on-site discussions have been held to-date.

Task 30% 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.*

Protocols have been developed or are in the process of being developed for all aspects of weevil rearing, weevil delivery onto the lake, and timing of weevil production. To help accomplish these goals, research studies regarding the date and temperature

concerning weevil survival and reproduction have been ongoing. Protocols to help monitor and evaluate the weevil release sites have been developed. Protocols to ensure consistent estimates of weevil density in the weevil rearing facility as well as the on-lake weevil release sites have been established. As the first giant salvinia growing season of the project begins, improved methods will certainly be implemented as more information is gained and understood. An initial small scale weevil release was conducted March 31st with an estimated 1,500 weevils released to an isolated area of the lake.

Task 40% Complete

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

No activity to report at this time.

Task 0% 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

No activity to report at this time.

Task 0% 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

Project personnel have continued the literature review into 'other' control methods. Preliminary findings are that there are both hydrological and mechanical means that are at least partly effective.

Task 25% Complete

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

No activity to report at this time.

Task 0% 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.*

Coordinating with Russell Castro with NRCS to develop and publish a landowner guide to Giant Salvinia and its control.

Task 5% 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*

Several newspaper articles have been written about the efforts being undertaken through this program. Project fact sheets have been developed and a revised version has been developed as well, TPWD produced videos are being promoted and other outreach items are in the works. A blog and facebook page have also been developed to provide additional avenues for reaching the general public and educating them on giant salvinia. Signage has also been established at the salvinia weevil rearing facility at Caddo Lake NWR describing the need to address giant salvinia infestations and how bio-control can be used as a tool to do so. In addition, CISE project member, Dr. Mike Masser, has conducted four educational programs of Extension clientele in 6 counties on pond and aquatic vegetation management where the giant salvinia problem in TX and some of CISE's efforts in this arena were discussed. Eight more similar programs are planned for April and May. Future demonstrations and events are scheduled for the second quarter of 2011 to further educational and outreach objectives.

Task 30% 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*

Contact has been made with the North Texas Fly Fishing Club as well as the Shreveport Fly Fishing Club. Speaking engagements have been scheduled with these groups and it is hoped that a partnership in the project can be formed. Project personnel are actively seeking other groups who may be interested in partnering on the project.

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 now complete and provides links to numerous information outlets. Content is continually being added to the site. In addition, a facebook page and online blog have been created and are updated twice a month. 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: <http://www.facebook.com/caddo.salvinia>

Task 80% Complete

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

Project personnel are actively attending local meetings of various organizations to expand the distribution of information on project happenings, knowledge transfer and material dissemination. In addition, contacts have been made with local media outlets (both newspaper and television) to hopefully spread news regarding project developments as they occur.

Task 30% 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

Monitoring of designated lake areas of project interest has begun using GPS. GIS support for project goals will commence once sufficient spatial data has been attained and objectives determined.

Task 5% 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 on this task was initiated this quarter. Project personnel have been coordinating with Russell Castro with NRCS to develop and publish a landowner guide to Giant Salvinia and its control.

Task 20% Complete

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

Work on this task was initiated this quarter. Project personnel have been coordinating with Russell Castro with NRCS to develop and publish a landowner guide to Giant Salvinia and its control.

Task 20% Complete

Projected Work for Next Quarter:

- continue to refine the operation of the weevil rearing facility to produce as many weevils as possible for future on lake releases
- evaluate chemicals, combinations of chemicals and surfactants and varying chemical concentrations to identify the most effective means to kill giant salvinia in a cost effective manner
- conduct small-scale chemical treatments on Caddo Lake to verify the performance of the top performers from chemical trials described above in natural settings
- contract with a private chemical applicator to spray additional giant salvinia acreages above what is treated by local and state entities (~\$65,000)
- begin working with entities participating in the IAGSCT meeting to develop a protocol for large-scale weevil production and weevil release thresholds
- work with NRCS to develop small scale giant salvinia treatment prescriptions for inclusion in the NRCS Field Office Technical Guide

Attachments:

Photo 1: Putting out “weevil cages” on the lake for the salvinia weevil egg-laying study.



Photo 2: Initial small-scale weevil release for study purposes (~1,500 weevils) on Caddo Lake



Photo 3: Berlesse funnels being used to determine weevil density in the weevil tanks.



Photo 4: Current salvinia crop in the greenhouses

