



# WEEVILS SUCCESSFULLY DESTROY ACRES OF LAKE-INVADING PLANT

Through a statewide giant salvinia management program, a weevil that feeds exclusively on giant salvinia successfully destroyed about 150 acres of the invasive plant on B.A. Steinhagen Lake near Woodville in East Texas this summer. Now a similar effort aims to recreate these successful results at Caddo Lake in northeast Texas.

Researchers from U.S. Army Corps of Engineers, Texas Parks and Wildlife Department (TPWD), Texas A&M AgriLife Extension Service and Texas

A&M AgriLife Research are working in Texas to control giant salvinia, a free-floating aquatic fern native to South America. The plant has invaded 17 Texas lakes and other water bodies in the southeastern United States, according to Dr. Allen Knutson, AgriLife Extension entomologist at the Texas A&M AgriLife Research and Extension Center at Dallas.

Knutson said the rapidly growing plant forms dense mats, which interfere with water recreation,



displace native vegetation and reduce oxygen content of the water, often harming fish and other aquatic life.

Since late 2010, TPWD's Aquatic Habitat Enhancement Program staff has released more than 112,000 adult weevils, grown at its Jasper rearing facility, onto B.A. Steinhagen Lake.

Knutson, Dr. Abhishek Mukherjee and Dr. Kevin Heinz of Texas A&M University's Department of Entomology, along with Chris Moret of TWPD, have studied the population dynamics of the weevil at the lake throughout 2011 and 2012. Knutson said they have documented the weevils' impact on giant salvinia and identified ways to improve the effectiveness of the weevil as a biocontrol agent.

"Our research has shown that following the mild winter of 2011-2012, the number of overwintering weevils at B.A. Steinhagen Lake was about 20 to 30 weevils per kilogram of salvinia, which is a high survival rate," Knutson said. "This large spring population allowed weevils to quickly increase to numbers necessary to control salvinia. By mid-summer, their feeding resulted in widespread reduction in salvinia infestations at our research site on the lake."

"Weevil densities have now exceeded 60 weevils per kilogram of salvinia, which is an excellent population," Mukherjee said. "Populations of this size cause more damage to the plant than it can overcome and are able to effectively control giant salvinia."

"Photos taken before and after weevil releases illustrate the tremendous job the weevils have done in controlling giant salvinia this year," said Floyd Boyett of the U.S. Army Corps of Engineers. "We purposefully refrained from spraying this area to see what the weevils could do this year."

"Now, there is abundant open water, and what giant salvinia remains is contained within floating mats of grass or lotus along the shore," he said. "Weevils are in areas east and south of where they were released, indicating that the floating material must have carried the weevils a good distance and allowed them to establish."

Knutson said the team is hoping to recreate these results at Caddo Lake at a weevil-rearing facility at the U.S. Fish and Wildlife Service's Caddo Lake National Wildlife Refuge. The facility is operated by the Center for Invasive Species Eradication, a center of the Texas Water Resources Institute (TWRI), AgriLife Research and AgriLife Extension and in

collaboration with TPWD, U.S. Fish and Wildlife Service's Caddo Lake National Wildlife Refuge and the Caddo Lake Institute.

Lucas Gregory, TWRI's manager for the project, said giant salvinia is extremely abundant at Caddo Lake this year.

"The flood and freezes in the winters of 2010 and 2011 greatly reduced the amount of giant salvinia present in Caddo Lake, but it has come back with a vengeance this year," he said. "Some areas of the upper lake are almost impassable due to thick mats of salvinia."

So far in 2012, the center's weevil-rearing facility has produced about 50,000 adult weevils, which were then released at a research site on the lake, Knutson said.


"Efforts to establish a self-sustaining population of weevils on Caddo that will disperse widely and reduce the salvinia infestation are under way," he said.

"However, the effectiveness of the salvinia weevil, a tropical insect, is limited by cold winters, especially at Caddo Lake," he said. "Our research has demonstrated that populations of salvinia weevils vary in their ability to survive freezing weather. We are now searching for cold-tolerant strains of the salvinia weevil that could better survive cold winters in Texas and therefore have a greater impact on salvinia infestations the following summer."

Knutson and Mukherjee plan to acquire some weevils from Argentina later this year and evaluate their cold-hardiness in laboratory tests at Texas A&M.

"By collecting weevils in higher, and therefore colder, elevations in Argentina, we expect to find weevils more cold tolerant than those currently in the United States, which were originally collected from Brazil," Knutson said. "Finding more cold-tolerant weevil populations would be especially helpful when colder winters return to East Texas."

"We are confident that an integrated pest management approach including biological control combined with other control methods, such as herbicide spraying, will be successful," Knutson said.

The Caddo Lake giant salvinia project is funded by Congressional support through the USDA's Natural Resources Conservation Service. For more information, visit [txH2O](http://txH2O.twri.tamu.edu/publications/txh2o) online at [twri.tamu.edu/publications/txh2o](http://twri.tamu.edu/publications/txh2o). 

Giant salvinia thrived over the winter of 2012 in B.A. Steinhagen Lake. By August, weevils had cleared this part of the lake of most giant salvinia. Photo courtesy Floyd Boyett, U.S. Army Corps of Engineers.