

Michael Neisch

Dr. Daniel Roelke
Committee Co-Chair
Texas A&M University, 2258 TAMUS
College Station, TX 77843-2258
979-845-0169

Dr. Michael Masser
Committee Co-Chair
Texas A&M University, 2258 TAMUS
College Station, TX 77843-2258
979-845-7370

Giant salvinia is an invasive, introduced aquatic macrophyte that has quickly established itself in Texas waters. Listed as one of the most problematic aquatic plants by the state, giant salvinia is a floating weed capable of doubling in size in a week. It replaces native aquatic plants that provide food and habitat for invertebrates and fish and grows to such high densities that it blocks sunlight and reduces dissolved oxygen levels to dangerously low levels. Mats of giant salvinia become so thick that it is nearly impenetrable by boat and it easily clogs agricultural intake pipes for irrigation. First identified in 1998 in the Houston area, giant salvinia has since become established in Lake Conroe, Toledo Bend Reservoir, Caddo Lake, and other Texas impoundments. Current efforts to control giant salvinia include the use herbicides sprayed directly on the plant and salvinia weevils, an insect introduced from the plants native range. While both methods of control have proven to be successful, they both have their limits. Herbicide application is costly, time consuming and limited to the areas accessible by boat. The salvinia weevil has proven to be more efficient, but the insect has a hard time coping with Texas winters and must be restocked following the cold season.

My proposed research is to study the effectiveness of grass carp as a control mechanism for giant salvinia. Triploid grass carp have been successfully used in all areas of the state to control noxious aquatic weeds such as hydrilla. Through personal reports, it has been observed that grass carp will feed on giant salvinia, but the rate of control and preference for the plant is undocumented. I intend to confirm that grass carp will in fact consume giant salvinia and then use varying sizes of grass carp to determine the consumption rate. Following this, my focus will be to establish the preference for giant salvinia and evaluate triploid grass carp as a control mechanism.

Using triploid grass carp as a method of control for giant salvinia will be of great benefit to the state of Texas. First, grass carp will be a significantly less expensive control option. Upon stocking, grass carp are an effective for 3-5 years, compared to the short life span and slow dispersal of the salvinia weevil. They also require no annual maintenance and have fewer ecological side effects than herbicide use.

This proposed research will be done at the Corps of Engineers' Lewisville Aquatic Ecosystem Research Facility (LAERF). Founded in 1990, LAERF is dedicated to the study of the biology, ecology, and management of aquatic plants. In particular, they seek to maintain healthy aquatic ecosystems by replacing introduced species with native populations. I will have access to many resources at this facility including varied plant species and culture tanks. My partnership with them in this research will provide valuable knowledge about the use of grass carp in controlling giant salvinia.

Academic Qualifications

Undergraduate GPR:

GRE Score:

Relative Coursework:

Fundamentals of Ecology

Fundamentals of Environmental Decision Making

Oceanography

Oceanography Lab

Principles of Fisheries Management

Fundamentals of Ecology Lab

Ecology of Lakes and Rivers

Ecology of the Coastal Zone

Wildlife and Fisheries Conservation

Funding from this scholarship would be used to pay for travel-related research expenses. I intend to conduct my research at the Lewisville Aquatic Ecosystem Research Facility, requiring several days to weeks of overnight stay and travel from College Station to the facility.

Upon receiving my degree from Texas A&M, I desire to become a state or federal level limnologist. I great respect for the inherent value of our water resources and wish to help protect and manage the state's aquatic environments.