Distribution and Management of Invasive Aquatic Plants in the Ross Barnett Reservoir

Adapted from M.S. Thesis Research Proposal by Michael C Cox

Introduction

Invasive aquatic plants are a big problem in Mississippi. People first brought these plants to Mississippi because they were pretty or could serve as a food source for animals. Since then, these plants have become weeds that harm the use of water sources by people, native plant species, and wildlife. These plants grow in thick patches that choke out native plants. They also harbor disease-carrying insects, decrease property values, and decrease water quality.

The Ross Barnett Reservoir is a 33,000 acre fresh water lake. This lake serves as the drinking water supply for the City of Jackson and areas in Hinds and Rankin counties. It is surrounded by over 4,600 homes. This lake provides recreation such as fishing, boating, camping, and hiking. However, invasive plant species have become a problem to the reservoir. These problems include blocking boat channels, decreasing fishing areas, and reducing access to the reservoir .

Alligator weed

Alligator weed is a mat-forming weed introduced from South America into the United States in 1897. It has rapidly spread across the southern portion of the nation. It has the ability to grow in a variety of conditions. Alligator weed is an amphibious plant because it can grow on land or in the water. Alligator weed does not use seeds to reproduce. Instead, it makes new plants by sending out shoots and roots . Alligator weed in aquatic habitats has larger hollow stems, which provide buoyancy and gives them a free-floating mat-like habit. Terrestrial-growing alligator weed has smaller diameter stems.

Many techniques and procedures are being used to control alligator weed. Herbicides are one method being used. These do not work very well because the poison cannot easily reach roots. To solve this problem, the herbicides are applied in high concentrations, many times each year. This can become very expensive. For these reasons, herbicide use as a control for alligator weed is quite limited.

Using insects to control alligator weed was done in the 1960s. Scientists used a flea beetle, a moth, and a thrips from South America . Control of alligator weed from damage done by the flea beetle was observed in various locations. However, the flea beetle survives only in aquatic habitats and has no effect on terrestrial alligator weed . The flea beetle also has a more limited survival zone than alligator weed due to climate restrictions. Using both chemical and insect control methods provides the most effective and cost efficient control of alligator weed.

Water hyacinth

Water hyacinth is a mat-forming, floating water plant. It came to the United States before 1890 from South America. Water hyacinth can grow in many aquatic environments including lakes, ponds, rivers,

ditches, and backwater areas. Water hyacinth can double its population in under a month's time and is one of the fastest growing plants on earth.

Problems associated with water hyacinth include: decreasing water quality, poor mosquito control, and blocking water flow. Water hyacinth grows so fast and so thick that fishing areas are blocked, fish and native plants die, and water evaporates too quickly. Control of water hyacinth, like alligator weed, is mainly performed by chemical methods. Small and limited applications of herbicides have been used. In order to work, these herbicides need to be used frequently, which makes them expensive.

Several insects have been introduced to control water hyacinth. Some of these insects include weevils, mites, moths, and grasshoppers. Insects mainly stop water hyacinths from flowering. This limits their ability to reproduce.

Hydrilla

Hydrilla has been referred to as "the perfect aquatic weed" because it can survive in many aquatic areas. A native of warmer areas in Asia, hydrilla was first discovered in the United States in 1958 on the west coast of Florida. Over the next 25 years, the presence of hydrilla was reported in 13 more states within the United States.

Hydrilla populations can impose serious problems on water flow and recreational activities including: filter clogging in irrigation pumps, boating, water skiing, fishing, and swimming. Hydrilla also chokes out native aquatic plants. Hydrilla can outcompete native aquatic species for sunlight and nutrients, which lets it take over the area. A very fast growth rate of up to one inch per day allows hydrilla to reach the water surface very quickly. It then branches out and produces a dense mat of stems.

Control of hydrilla can be accomplished in several ways, depending upon how the water in which it lives is used. Using machines to pull it out of the water is a very expensive option. This method is only used if hydrilla is growing in rapidly flowing water, or if it exists close to water supply intakes. Grass carp were introduced in 1970 in Florida for a potential biological control agent of hydrilla. Although they do a good job of controlling hydrilla, grass carp cannot be used in water bodies like the reservoir. That is because the carp also eat the plants that are necessary for good fishing and waterfowl habitat .

Over 40 species of insects have been found to control hydrilla. Some of these include a weevil, a leaf mining fly, and an aquatic moth. The most damage of hydrilla observed by an insect was from the larvae of aquatic moths. However, these insects can also cause damage to other plants and are effective only in the spring and summer. Hydrilla can grow year-round in Mississippi. Most herbicides do not kill hydrilla. Reasons for this include hydrilla's fast growth and multiple means of propagation.