Water Hyacinth Management – a Good Example of Maintenance Control in Florida

In 1899, the 55th U.S. Congress, through the Rivers and Harbors Act, authorized the U.S. Army Corps of Engineers (USACE) to crush, divert, or remove water hyacinth (*Eichhorina crassipes*) from the St. Johns River and its tributaries. Passive devices such as log booms and fence barriers were placed across infested creeks and streams to prevent discharge of floating water hyacinth plants into the main river. Later, steam driven conveyers and other mechanical devices were employed. This mechanical removal of water hyacinth was almost exclusively used until the late 1940s.

Water hyacinth covering a Florida waterbody.

Mechanical efforts eased but did not solve the water hyacinth problem. Even the most efficient machines could not operate effectively in shallow water along shorelines and left a continuous source of plant material for reinfestation.

Organic herbicides were invented in the 1940s and replaced mechanical means used to control water hyacinths. It was hoped that water hyacinth and other invasive plants could be eradicated using this new technology. However, research showed that water hyacinth was too well established in Florida to be eradicated, but management was possible if done consistently and strategically.

Despite extensive management efforts during the 1960s, water hyacinth removal at a statewide level was fragmented because there was no lead agency to coordinate control efforts. Because many of Florida's public waters are interconnected, unmanaged waters served as contamination sources for downstream waters with control programs. As a result, the USACE estimated the water hyacinth population in Florida exceeded 126,000 acres and projected another 49,000 acres unless improved management strategies were instituted.

The Department of Environmental Protection (then the Department of Natural Resources) was given the authority in the early 1970s to coordinate the activities of all government agencies in Florida to alleviate the state's aquatic plant problems.

Maintenance Control: Water Hyacinth

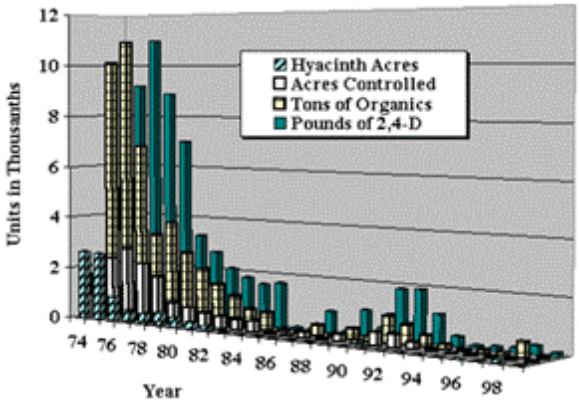
The concept of maintenance control of invasive plant species in Florida's natural waterways was developed by the USACE in 1973. Maintenance control is a strategy to be used in a coordinated manner on a continuous basis in order to maintain the targeted plant population at the lowest feasible level. This strategy was adopted by DEP in 1974.

Previous efforts allowed the water hyacinth population to reach problem levels before control measures were implemented. These efforts resulted in the death of large amounts of floating plant material, which led to severe environ-

mental damage to a waterbody by decaying plant material resulting in low dissolved oxygen levels and fish kills.

Water hyacinth management along the Suwannee River is a good example of the benefits of maintenance control. At one time, water hyacinth covered more than 2,400 acres of the Suwannee River during 1974. Marshes and creeks were clogged, and fringes sometimes more than 150 feet wide lined the river channel. To preserve navigation, more than 7,700 lbs of herbicide was applied in 1974. Several thousand tons of organic material from decaying vegetation was deposited into the waterway as a result, in addition to that from leaf and root material naturally sloughed from live plants.

Maintenance control operations were begun during 1976 to reduce the amount of water hyacinth on the Suwannee River. The amount of plant material killed, herbicide used (2,4-D), and management costs increased initially but decreased along with the tonnage of organic material produced as water hyacinth coverage was reduced. By the early 1980s, maintenance control had been achieved along the Suwannee River (see graphic below).



Because of this new management strategy, maintenance control replaced crisis management in the late 1970s reducing environmental and economic impacts. Native plants have returned to the shores and marshes of the Suwannee River, restoring fish and wildlife habitat.

Maintenance control of water hyacinth was achieved in Florida public waters during the early 1990s. This once widespread plant, although present in about 65 percent of Florida's 450 public bodies of water, has been reduced to a minor component of their flora (less than 2,000 acres statewide at any one time). However, to maintain water hyacinth at this low level, nearly $2 million are spent annually controlling as much as 15,000 acres of this invasive plant.

Lessons of Maintenance Control

The first lesson provided by the water hyacinth example in Florida is that harmful impacts of even widely dispersed and seemingly unmanageable invaders is possible with a well coordinated and committed effort along with adequate funding to place a species in maintenance control. The second lessen is lower environmental impacts, less herbicide use, and lower management costs are a direct result of applying a maintenance control management strategy to a widespread invasive plant species in Florida's environment.

Reference:

Schardt, J.D. 1997. Maintenance Control. Pp. 229-243. In: Simberloff et. al. (eds.). S*trangers in Paradise: Impact and Management of Nonindigneous Species inFlorida.* Island Press, Washington, D.C.