

Water Chestnut Management Program 2001

Summary of the Second Years Efforts of the New York State Canal Corporation in the Lake Champlain Basin

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**John Dergosits/Robert Romeo
New York State Canal Corporation/New York State Thruway Authority
Albany, New York**

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Introduction

Since 1982, over 3 million dollars has been spent to control the advance of water chestnuts (*Trapa natans*) in Lake Champlain. Water Chestnut, an aggressive, aquatic plant that is native to Europe and Asia was introduced to New York State in the late 1800's. The water chestnut infestation spread rapidly northward in the Hudson River Basin and into the southern end of Lake Champlain. The continued northward advance of the infestation prompted a renewed control effort by both the New York State Department of Environmental Conservation (NYSDEC) and State of Vermont Department of Environmental Conservation (VTDEC) in the early 1990's on Lake Champlain.

The water chestnut plants are 90% water and decompose quickly once harvested with the exception of the seedpods or "nuts" which are covered in a tough outer coating. The outer coating becomes more resilient as the nuts mature and drop from the plant to the bed of the water body to sprout into a new plant the following season. It is not uncommon to see a dozen or more nuts produced by one plant making the job of controlling this prolific species more difficult.

Harvesting activities are generally of two types, mechanical and hand harvesting. Mechanical harvesting is done in dense beds of the plant, removing the floating mass of plant material by cutting the shoots attached to a previous years nuts buried in the sediment floor. The weed mass is collected in a mechanical floating harvester that transports the material to the shore for disposal. Hand harvesting is by hand pulling and collection of the plant. This technique is normally used in very shallow water or areas with sparse growth. Hand harvesting can also be done using divers in deeper water.

Harvesting is typically scheduled for the middle part of the plant's growing season. This is to prevent the nuts from maturing and detaching from the plant. Care is taken not to start the harvesting too early to prevent the mature nuts on the water body floor from re-germinating after the weed canopy above is removed.

In 1993 an application was made jointly by the NYSDEC and VTDEC to the Adirondack Park Agency (APA) to allow for the collection of water chestnuts in Lake Champlain with disposal in upland locations in Vermont. In August of 1994 a Project Permit (94-208) was issued for a seven-year period for harvesting activities in the Lake Champlain Basin, north of latitude 43°33'00". In July 2001, APA granted a new permit (2001-47) for a 10-year continuation of hand and mechanical harvest control program of water chestnuts in the southern basin of Lake Champlain.

Description of Calendar Year 2001 Activities

The 2001 Weed Harvesting program for water chestnuts started approximately 1 month later than the previous year activities. This resulted in a decrease in the amount of water chestnuts harvested from the previous year. The areas harvested by the NYSCC in 2001 totaled approximately 92 acres (see figure #1) compared with 130 acres harvested the prior year.

The capacity of the harvester unit is approximately 450 cubic feet or 16.7 cubic yards. Based on calculations, the average load contains a wet volume of about half or 8.2 cubic yards per load.

The late start resulted in a decrease from 1003 loads in year 2000 to 781 loads in year 2001. The wet volume for 2001 calculates to 6404.2 cubic yards. Costs including equipment rental and fuel is \$95.01/load or a total cost of \$11.59/cubic yard or \$809.19 per acre. This is a decrease of almost 60% in costs compared to the prior year. This reduction primarily occurred since no equipment purchase was required this year along with staff having a better understanding on the operation of the harvesting equipment. Labor cost was \$48.99/load compared to \$55.73/load in 2000, \$5.97/cubic yard to \$6.80/cubic yard in 2000 or \$417.24/acre harvested compared to \$420.30/acre harvested. Fuel costs were also lowered to \$0.0685/cubic yard.

Observations

During the 2001 activities, four operational difficulties were observed that should be addressed if harvesting is to continue and expand in the south end of Lake Champlain.

First is the need for additional disposal sites closer to the harvesting activities. Permission was obtained to use private lands for disposal of the harvested material, but additional sites are need. This will maximize productivity in the harvesting activities and transportation activities. Permitting activities associated with application of the weed material onto adjacent farmland should be initiated sooner in the planning process, since the properties are within the APA.

Secondly, there is a need for additional access points for placement of the shore conveyor. The harvesting cycle time was lengthy due to the slow travel speed of the harvester back and forth to the shore conveyor, while harvesting adjacent to the northern end of South Bay near the railroad tracks. This cycle time could be significantly shortened if an access point can be found on the north end of the Bay.

Third is the need for a dedicated crew to operate the harvester and ancillary equipment. The operation of the harvester is quite involved due to the need to properly load the harvester conveyor, preventing the cut weeds from becoming dislodged. The ability to accomplish this is gained by on-the-job training of the operators. If weeds escape during

the harvesting operation they can drift in the water body and possibly root again in other locations, depending on the time of season. The training gained from the previous year operation is not passed on through the use of seasonally hired operators.

The forth and most crucial observation is the generally slow speed of the harvester as it moves to and from the harvesting location. We believe that significant cost savings in travel time, equipment wear and tear and personnel costs could be achieved through the purchase of a high-speed transporter. This unit connects to the harvester to allow up to two loads of weeds to be transferred from the harvester. Then, while the harvester cuts a third load, the transport brings the double load to the shore conveyor for off-loading. The cost to purchase a transporter is approximately \$ 90,000. However, production may be increased by 100 percent through the use of a transporter.

Recommendations

With the continuation of the harvesting program in 2002, the following two options appear to be the most viable for increased production and effectiveness of the program.

Option 1: Harvesting operations continue to be funded at the current level as they were for the calendar year 2001. This option will limit the area of harvesting to approximately the same as accomplished this year. Weather and lake conditions will determine if extended operations will be warranted.

Option 2: Increasing of the budget for harvesting to include the purchase of a high-speed transport for the calendar 2002 year. Harvesting travel time will decrease and operation efficiencies will be increased by purchasing this equipment and identifying additional access points. It should be noted that harvesting and transport equipment is typically constructed based on when a purchase order is received. Therefore, a commitment to purchase the transporter will be needed by the first of the year should this option be selected.