Wayne County Soil & Water Conservation District

AQUATIC VEGETATION CONTROL (AVC) PROGRAM

2016

Acknowledgment

The success of this program depends greatly on numerous groups and individuals. The Wayne County Soil & Water Conservation District would like to thank the following for their support:

Wayne County Board of Supervisors
Town of Sodus
Town of Huron
Town of Wolcott
Wayne County SWCD Board of Directors
Finger Lakes Lake Ontario Watershed Protection Alliance
The Department of Interior, Fish & Wildlife Service
The numerous private landowners that provided access for equipment

Introduction

Mechanical harvesting has proven to be a short-term, effective and environmentally safe means by which to control excessive aquatic plant growth. It is also one of the few options to completely remove the nutrients, which are bound in plants, from a waterbody. This is in addition to the extensive watershed projects being done to provide nutrient control. The Wayne County Soil & Water Conservation District has administered an Aquatic Vegetation Control (AVC) program in Wayne County's Lake Ontario embayments since 1988.

Preparation for each season begins in May while harvesting operations are performed, on average, from early June to mid-September, and continues through a planned period of maintenance into November. The AVC program employs four to five crew members for four, 10-hour work days a week to operate three (3) harvesters. Annual startup and end dates are dependent on seasonal growth variations that are reliant on numerous environmental factors as well as access for the equipment to the waterbody. Final determination of when and where the harvesting operation will begin is made based on observations by District staff and is described in the *Aquatic Plant Mechanical Harvesting Policy* (see attached at end of report). A member of the District technical staff has day to day responsibility for the coordination and implementation of the program and seasonal crew are hired to operate the harvesters and the associated equipment.

The pattern of operation for harvesting aquatic plants varies per situations, conditions, and locations. The most common pattern is to harvest from docks-end outward to a point in which the 'weeds' become less dense and mechanical harvesting efficiency lessens. The annual goal of the program is to capture and remove 500 harvester loads of nuisance aquatic plant material from all five bays serviced over the length of the season. The mechanical harvesting component

is evaluated by comparing time spent on respective activities to the amount or tonnage removed and assistance provided to the public. The District will continue to share results and lessons learned with adjacent County efforts, and adapt management policy and practices where recommended.

For the 2016 season, aquatic vegetation concentrations present in East Bay and Blind Sodus Bay were significantly less than observed in previous years. Access to these two bays was also hampered by the lower than average water levels of Lake Ontario. The District made the decision to not harvester East Bay or Blind Sodus Bay based on these observations.

Results and Discussion

Harvesting operations for the 2016 season were carried out for 67 days between June and September. The final removal amounts for each bay are as follows;

Sodus Bay – 775 loads,
Port Bay – 57 loads, and
Maxwell Bay – 55 loads.

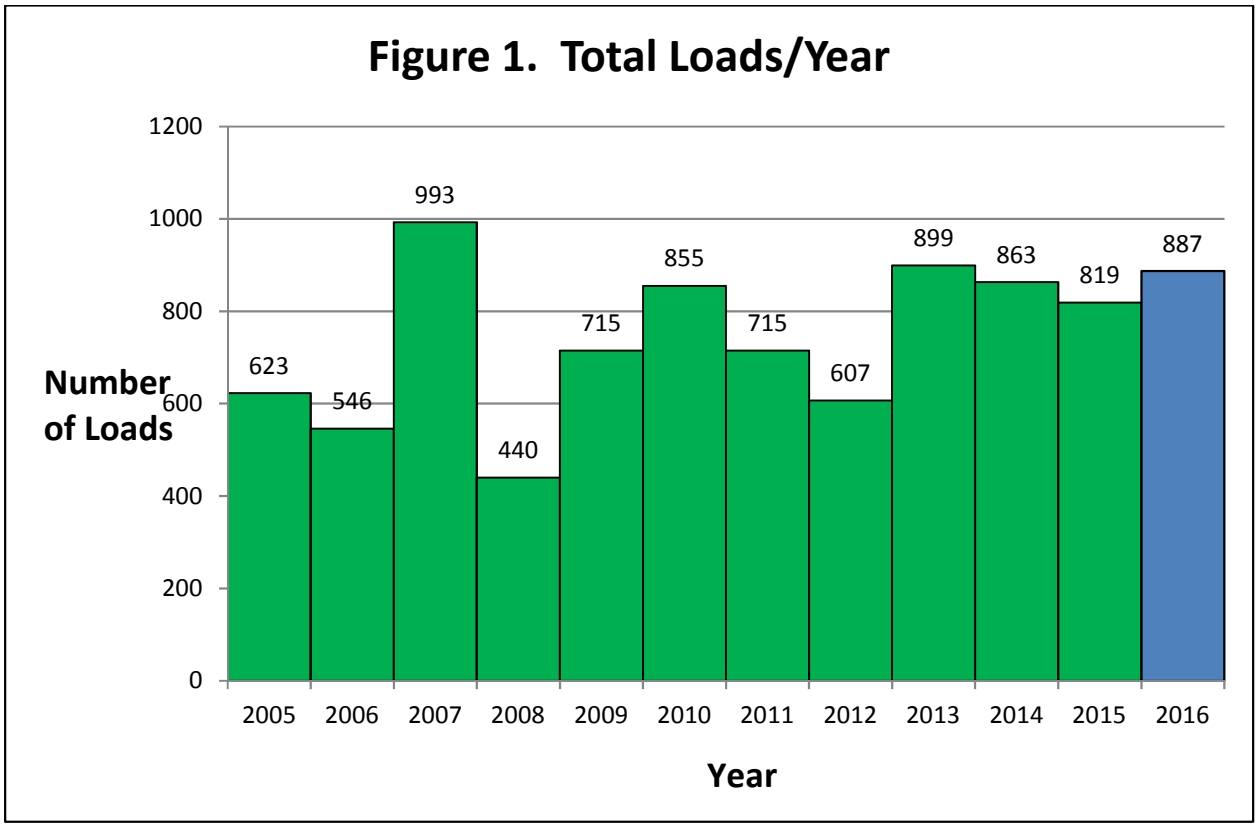
The total amount removed from the three (3) embayments was 887 loads. The general rule in previous years has been that one (1) harvester load is equal to two (2) tons of wet plant material. With the advancements in the equipment that SWCD deploys, it has come to attention that 2 tons may be a drastic under-estimation for the capacity of a single harvester.

Variations in the amount of vegetation removed and time spent between the bays are due to the physical characteristics of each waterbody. Sodus Bay being the largest (3,150 acres and 20 miles of shoreline) will annually have the potential to grow more 'weeds.' Another important characteristic is the size of each bay's Littoral Zone; the portion of the water body where adequate sunlight penetrates to promote photosynthetic activity in plants and is usually defined by a certain depth. In Wayne County's bays, the littoral depth is approximately 10-12 feet. The area of littoral zone of each bay is as follows: Sodus Bay – 1,575 acres (50%); Port Bay – 132 acres of 475 total acres (28%); East Bay – 174 acres of 189 total acres (92%); Blind Sodus Bay – 46 acres of 235 acres (21%); and Maxwell Bay – 7 acres (100%). With nutrients entering the bays from multiple sources and with adequate sunlight penetration to extended depths, aquatic plants have to ability to form expansive 'weed beds' within each bay.

Total operating time of the AVC Program is calculated by each harvester operating a 10-hour shift each day. Therefore, 3 harvesters would produce 30 operating hours in one day. Comparing 2015 and 2016, total operating time slightly increased from 1600 hours in 2015 to 1718 hours in 2015. This is most likely due to the 2016 program operating 67 days compared to 62 days in 2015.

Non-harvesting down time due to mechanical issues and repairs totaled 222 hours. The mechanical issues encountered this year were associated with the moving parts systems of the harvesters' cutting head (i.e. broken/bent knives, worn out tie-rod bearing). Multiple hours were spent replacing the components of the cutting blades. Damage to the blades is most often caused by the harvester head colliding with underwater structures. Accidental collisions do occur but some of these can be avoided by the operator exhibiting caution while harvesting. Another mechanical issue that occurred this year was the associated with the hydraulic system. Harvester #2 and #4 (twice) each had ruptures to the main hydraulic line. This caused the harvesters to lose large amounts of its vegetable-based hydraulic oil. This was especially frustrating due to the problem happening twice with the newest harvester (#4). This may have represented a design flaw in the harvester. The District required that the manufacturer make repairs and modifications to help prevent the ruptures from happening again. The operating crew and crew leader make a superb effort to return the harvesters to operation as soon as possible when mechanical issues arise. The program also experienced down time due adverse weather condition (50 hours) and not having an operator available due to planned vacations (40 hours).

The AVC program had a strong year, operating (3) mechanical aquatic vegetation harvesters. Figure 1 represents the annual removal totals since 2005. Wayne County SWCD has recorded annual removal amounts since the Program's beginning and are available upon request. Figure 1 outlines that the program was able to exceed the annual goal of 500 harvester loads in 2016. Fluctuations from year to year are affected by numerous variables that are outlined in the *Aquatic Plant Mechanical Harvesting Policy* and discussed further in this report.



The most important factor that influenced plant density in 2016 was the seasonal Lake Ontario water level fluctuations. Historically water levels peak in June. This year, water levels peaked in April, decreasing through the summer. Lake Ontario water levels remained below the long-term seasonal average from June through the entire harvesting season. The higher than average water levels in the spring limited the amount of early season plant growth. Once the water levels receded, a drastic increase in aquatic plant growth occurred. This was more typical in Sodus Bay where the water clarity commonly extends into the 12 feet of water depth range. Port Bay, East Bay, and Blind Sodus Bay have historically appeared more turbid, or green, than Sodus Bay. Turbidity in East and Blind Sodus Bay limited plant growth for the entire length of the AVC season. Port Bay's increased turbidity limited plant growth in the later season. Seasonal precipitation for the 2016 AVC program could be categorized as moderate drought conditions with short, intense bursts of rain. This intense rain impacting on unsaturated soil would lead to increased surface runoff, contributing nutrients to waterbodies. Increased nutrient loading leads to increased turbidity in the receiving waterbody. This prevented UV light from reaching plants further out in the littoral zone, thus limiting availability for photosynthesis.

Recommendations

1. As with every season, 2016 brought about various obstacles and opportunities for improvement to the AVC Program. **For the 2016 season, the District Website (http://www.waynecountynysoilandwater.org) continued to post a schedule on the District calendar that was updated 2 to 3 weeks in advance of harvesting a certain area.** This provided the public a simple way to access information regarding the AVC program and other SWCD programs and initiatives. This drastically decreased the number of office phone calls regarding the program. The District will continue to use this tool along with the Water Quality Hotline to provide information to the public for the 2015 season.

2. The harvesters were called away to different areas before they were finished working at the site they were located at. This is a downfall of having a schedule published and miscommunication among the staff. It would be beneficial for the harvesters to stay at their present location and finish the area before leaving for a different area.

3. **An issue that is apparent each year is the need for more and closer access sites for off-loading plant material.** A significant majority of the shoreline is privately owned and heavily developed. Access depends on permission from the land owner. With off-loading sites in closer proximately the areas being harvested, production can be increased by greater than 50 percent. A situation that happened a number of times this year was that the access site would become too damp for the dump trucks to operate and harvesting would be halted. **This was most notable on Sodus Bay at Sunset View Trail. The District completed an access site improvement project this year and the production in this area increased drastically.** More access sites available would allow the operators to move to a more useable site to continue harvesting. SWCD staff continually pursues access sites on both public and private lands in an effort to improve efficiency.

4. **The final recommendation is to continue the numerous effort of watershed education.** The District made valuable steps at providing the public with information on various watershed management initiatives throughout the County. The most important aspect of this effort is the realization that we, as a community, are responsible for protecting our watershed and the valuable natural resources within it.

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Aquatic Vegetation Mechanical Harvesting Policy

Criteria which determines when and where aquatic vegetation is to be harvested includes:

1.) **Climate**: Increased light, high water temperatures and low water levels associated with the harvesting season increase the likelihood of excessive plant growth. Harvesting operations will be delayed if environmental conditions jeopardize the safety of the crew members and equipment.
2.) **Funding**: Securing funds from multiple agencies and municipalities determines the duration of the harvesting season and prioritizes areas to be harvested.
3.) **Plant Species**: Although native plants have the potential to cause congestion of navigable water, the removal of invasive plant species is important to a healthy balanced ecosystem. Areas with excessive non-native plants will receive precedence.
4.) **No-Cut Areas**:
    a.) **Native Plants** – These areas have significant populations of beneficial or protected native plants. Native plants are encouraged to spread into areas where invasive plants have been removed. These areas are the most difficult to determine because of constantly changing climate and environmental conditions.
    b.) **Machinery Hazards** – These are areas of rocky structure, submerged cribs, ruins and shallow areas where harvesting equipment cannot operate due to potential damage to equipment. These areas include in between and around docks.
    c.) **Undeveloped Shoreline** – These are undeveloped areas where constant access is not needed.
    d.) **Sensitive Habitat** – These are important fish spawning and juvenile fish cover areas and sanctuaries for various turtle species identified by the NYS DEC.

The SWCD staff will perform regular reconnaissance surveys in order to evaluate areas and determine when and to what extent mechanical harvesting is appropriate. Mechanical harvesting effectiveness is dependent on access location for the program's shoreline conveyors and dump trucks. The closer the access point, the more effective the harvesting operation can be.