

## **2013 Hydraulic Conveyor System** **Final Harvesting Report**

The summer harvesting season of 2013 was a continuation in the Hydraulic Conveyor System's (HCS) program development, building upon the strong operational base established in the initial summer of HCS operation in 2009. Continued refinement of operational protocols has taken place over its years of operation, but the overall goal of the HCS continues to be for the purposes that it was designed for; removing new, previously undiscovered points of infestation of EWM. It is by removing these newly discovered infestation sites that the goal of stopping or greatly reducing the spread of EWM before it becomes established may be realized.

### **Concept & Design:**

The concept and design of the HCS is to remove EWM from specific areas where treatment by other means is not feasible or advisable. The HCS is designed to remove EWM in areas of new infestation where the size of the new outbreak is small enough to preclude chemical treatment, and where the diver can remove the entire outbreak before it spreads or becomes established to the point where it adversely affects the native plant and animal community. In addition, the HCS works well in areas where other treatment regimes cannot be used effectively. These areas include areas around and behind docks, areas under boathouses and other structures, and areas where the use of other treatments may adversely affect sensitive areas. A third use for the HCS, although not a use that was anticipated when the concept and design were under development is in locations where chemical treatments have proved ineffective, and where the risk of EWM propagation from fragmentation is high. This includes areas of high EWM density that are susceptible to high boat traffic.

### **Historical Perspective:**

Historically, the HCS system has been remarkably consistent in its seasonal harvesting results, with the environmental factors of early season water temperatures and the resulting degree of plant development during the month of June being the determining factors.

|                               | 2009   | 2010   | 2011   | 2012   |
|-------------------------------|--------|--------|--------|--------|
| Number of sites               | 88     | 101    | 89     | 81     |
| Seasonal drained weight       | 18,725 | 18,301 | 22,507 | 17,699 |
| Approximate area (in sq. ft.) | 28,435 | 21,555 | 64,243 | 30,401 |
| EWM selectivity (bi-catch)    | 89%    | 91.98% | 92.73% | 91.75% |

### **Limiting Factors of Success:**

Of the four elements noted above that we have reported on a yearly basis, only “*Seasonal Drained Weight*” gives an accurate measure of the program’s progress, as it is an actual representation of what the HCS system accomplished during its time of seasonal operation. The other two measures of harvesting; “Number of Sites” & Approximate Area (in Square Feet”) do not represent any accurate measure of success because they are simply indicators of EWM plant density, and the homogenous nature of the beds harvested. In beds that are more homogenous (higher density of EWM vs. other plant species), relatively more daily drained weight is harvested in less square footage. In beds that have a more diverse plant community, the amount of daily drained weight is less because the rate of harvest is slowed in order to only harvest the target species (EWM).

Over time (several seasons), it is possible that the number of higher density beds requiring HCS harvesting could decrease in favor of less dense beds with more plant diversity. As this trend happens, the daily drained weight of harvested EWM would fall as the harvesting is slowed and the number of EWM plants harvested decreases. In practice however, the size of the watershed is so great that the emergence of new & dense beds of EWM at new locations seems to overshadow the elimination of high density older beds. It seems that there are always new & dense beds to harvest.

### **2013 Harvesting Results:**

The following results were obtained during the 2013 harvesting season:

|                                |                               |
|--------------------------------|-------------------------------|
| Number of sites:               | 106 sites (see Table #1)      |
| Seasonal drained weight:       | 20,311#                       |
| Approximate area (in sq. ft.): | 34,250 Sq. Ft. (see Table #1) |
| EWM selectivity (bi-catch):    | 93.58% (see Table #2)         |

### **Discussion:**

*Number of sites:* Harvesting days in 2013 were increased relative to earlier years because neither of our divers were returning to school, which in the past had required the cessation of harvesting as divers returned to campus. With the increase in harvesting days, more sites were able to be harvested. In addition, divers indicated that overall site size was less than prior years.

*Seasonal drained Weight:* Seasonal drained weight was consistent with prior years experiences. Fluctuations in drained weights tends to be a product of the number of harvested sites, as well as EWM bed plant

density. In 2013, the number of harvested sites was up but EWM bed plant density relative to prior years was down.

*Approximate Area:* “Approximate area” harvested has little value in understanding the nature of the annual harvest, because the plant density within the harvested sites has no “baseline” value. There can be no comparatively valid conclusions drawn between a 100 square foot area with 10 EWM plant clusters of 10 stems per cluster, and a 100 square foot highly dense bed with 50 stems per square foot.

*Bi-Catch:* Bi-Catch sampling provides a snapshot in time of diver efficiency in 1. plant identification and 2. ability to selectively harvest only the target species (EWM.) Over time, Bi-catch % of the target species should increase as diver skills in these areas develop. In 2013 the previous experience of our divers was a factor in our high harvesting efficiency.

### **Conclusion:**

The Tomahawk Lake Association believes that the 2013 HCS harvesting season was successful in the control and reduction of new EWM outbreaks within the watershed. Over time the goal of the HCS is to reduce both the number and size of new EWM sites within the lake system. If we operated in a small watershed with limited access, our ability to meet these goals would be greatly enhanced. However, Tomahawk Lake’s large sizes, diversity of the character of the lakebed, and the high degree of public usage of the resource all have a negative effect on attainment of these goals.

The Hydraulic Conveyor System is one element in a two tiered treatment regime in our effort to control and reduce the effects of Aquatic Invasive Species in our watershed. It is important to evaluate the program’s successes by comparing year to year harvesting data. However, the comparison which would prove to be the most valid in evaluating the success or lack of success of the two tiered program cannot be made. That evaluation would include the comparison of the results of the two tiered treatment regime in our watershed, against the results of no treatment regime in our watershed. In that comparison I believe that our two tiered approach would be seen as a highly effective means of control.

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2012 HCS operations were consistent with previous harvesting seasons. The basic priorities and methodology remained virtually unchanged, but the types of sites changed somewhat. Because the lake association's chemical treatments in the spring of 2012 were more effective in controlling EWM in the larger and denser beds, the HCS was able to spend a greater portion of its harvesting time searching for and removing the new and smaller pioneering plant infestations for which it was designed to control. In addition, sites harvested continued to evolve away from high density homogenous beds of EWM, to beds including a greater number of native plants. Harvesting mixed beds with greater species diversity tends to slow harvesting, and limit the area harvested in a day's time.

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