**Town of Schleswig**
**Sanitary District 1**
**Cedar Lake**
**18107 Klemme Road**
**Kiel, WI 53042**

September 23, 2021

Ms: Mary Gansberg
WDNR Water Resources Biologist
2894 Shawano Ave.
Green Bay, WI 54307-0448
Mary.Gansberg@wisconsin.gov

Re; Weed Cutting Report – 2021
Town of Schleswig Sanitary District No. 1
Cedar Lake, Manitowoc County

Dear Ms: Gansberg,

This is the 2021 Weed Cutting Report for the Town of Schleswig Sanitary District No.1; Cedar Lake located in Manitowoc County.

This report presents the aquatic plant harvesting activities along with related issues and accomplishments. These issues and accomplishments have a direct effect on future aquatic plant management activities in Cedar Lake. Attachments to this report will identify specific weed cutting dates, hours of cutting, and location of cutting. The attached Weed Harvesting Logs refer to the Cedar Lake Weed Harvesting Map that has the referenced cutting locations.

Significant increase in the quantity of Eurasian Water Milfoil is requiring a reassessment of the success of herbicide treatment, DASH, hand pulling and biological treatment. The lake appears to be beyond initial stages of EWM establishment but still at a stage where combined control efforts can be effective. A review and action plan will be developed and implemented in 2022.

**Aquatic Plant Management Plan:**

In accordance with the requirement of the Weed Harvesting Permit, The Town of Schleswig Sanitary District Number 1 contracted Northern Environmental, Inc. in 2005 to develop an Aquatic Plant Management Plan to help identify Cedar Lake's aquatic plant status. The Plan was completed and identified plant species and sensitive areas to maintain a balanced lake system. The Aquatic Plant Management Plan allowed the Sanitary District to apply for a WDNR grant for assistance in funding of a replacement weed harvester which was purchased in 2006.

The Sanitary District prepared and received a Grant Application to develop an updated Aquatic Management Plan. The field work for the APMP update was completed in 2017 with results

indicating no substantial change in the plant community. An Aquatic Plant Harvesting Permit was renewed for 2018 and expires December 31, 2022.

In conjunction with the Plan update, a Grant Application for a replacement Aquatic Plant Harvester was submitted and a 35% grant was received from the DNR. The new harvester was in operation in 2017.

**Weed Cutting Conditions, Observations and Operations:**

## Lake Conditions and Observations

Ice left the lake on March 27, 2021.

The lake's level was 2 inches above the outlet in May and stayed above the outlet invert during the summer. Record setting rainfall of over six inches within 12 hours in July required the lake to be limited to Slow No Wake boating for a few days. The lake remained at high levels throughout the summer. There was no need for the 500 gallon per minute high capacity well to be turned on.

Wild Celery plant growth appeared in several areas of the lake where it had not been previously seen. A number of Wild Celery weed bogs similar to last year were harvested Increased harvesting may have kept the Wild Celery weed bogs to a reasonable in the North Bay. Elodea bogs approximately 3 feet in diameter were prevalent during early summer of 2016 but not seen in 2017, 2018, 2019, 2020 or 2021. Naiad and Duck Weed seemed to be more prevalent than previous years. The harvesting of Eurasian Water Milfoil (EWM) and Wild Celery weed appeared to be the predominant plants harvested through most of the summer. Prior to the increase of the Wild Celery, Native Northern Water Milfoil was the predominant species harvested. Additional Eurasian water Milfoil locations were documented.

Muskrat sightings and trapping were similar to the number of those trapped in 2021. The muskrat trapping chart is attached. Normal boat traffic seems to dislodge the buoyant Wild Celery plants during late summer. Muskrat activity may be another cause of the dislodged plants.

## Plant Harvesting Operations

Due to the spread of EWM and a WDNR rejection to allow the herbicide treatment of approximately 5 acres of dense EWM spots. Five harvester operators were hired and additional harvesting hours were spent on the “No Treat” dense EWM spots. The mechanical weed harvester operators had reviewed and complied with the WDNR Harvesting Permit Conditions.

The weed cutter operation was primarily Monday through Friday during hours of no wake boating; 7:00 am – 11:00 am. In August and September, additional harvesting occurred on Saturday, Sunday and some evenings in an effort to keep the EWM from reaching the surface in boating areas.

Weed cutting locations were substantially limited to the 35 acres of areas identified on the attached lake map. Northern Water-milfoil appeared to be a small portion of the harvested plants compared to plants harvested prior to 2005.

Mild algae growth with no major blooms was noted in the spring and later in the summer. The secchi disk readings were typically around 10 feet for most of the summer.

**Weed Cutting Results:**

The attached 2021 Weed Harvesting Log identifies that weed were cut and harvested over 86 days resulting in 80 harvester loads of weeds taken for disposal and used as farm field compost. Estimating the harvested weeds to weigh 30 pounds per cubic foot and a load (Harvester not truck) to be 5 ft by 10 ft by 3 ft, a load was 150 cubic feet or 4,500 pounds. Therefore, the total harvest for 2021 was 179 tons (30 loads x 4,500 pounds per load / 2,000 pounds per ton).

The attached Weed Harvesting Chart with graphs presents the tonnage of aquatic plants removed. It also presents the impact of hours of harvesting "No Treat" EWM areas. The 2021 EWM growth increased significantly from 2020. Increases in EWM location and density, increases effort to maintain clear boating. The resulting harvesting seemed adequate to provide control around piers, diving platforms and water-skiing lanes while allowing for undisturbed area over the majority of the lake to promote diversity in the plant community.

The harvested submergent weeds were substantially Pond Weed (not Curly Leaf) in June/July and predominantly EWM and Wild Celery in late August/September. Harvesting occurred primarily along the shoreline in lake depths of 12 ft to 5 ft. Observations indicated that populations of Pond Weed, Wild Celery Weed, and EWM tend to be located in areas of lake depth less than 12 feet. The Wild Celery Weed was predominantly located in Northern Bay but it appears to be establishing itself in other locations each year. The Wild Celery bogs tend to be caused but motor boating activities and the muskrat population. The harvested areas totaled approximately 35 acres. Most of the harvesting occurred on the west end of the lake and in Northern Bay. This is due to density of weeds, lake depth of less than 12 feet, muck lake bottom, and number and location of complaints. Continued effort should be made to document the spread of the EWM, Wild Celery Weed and reduction of the Northern Milfoil.

It is noted that in the mid '90's, the predominant weed harvested from the lake was Northern Milfoil. Currently there is minimal removal of the species and it is rarely found.

**Invasive Species:**

In the spring of 2009, DNR representatives identified Eurasian water Milfoil at the boat landing. Upon notification, Sanitary District representatives contacted the DNR to determine proper eradication methods. A permit for the application of the aquatic herbicide was received. Hand removal followed up with an aquatic herbicide application had proved temporarily effective. However, the Eurasian Milfoil was subsequently observed and a request was made to allow additional aquatic herbicide treatment in a localized area during 2013. A permit for selective herbicide treatment was issued and localized treatment near the boat landing occurred in the early summer. During 2014, additional lake invasives inspections by residents and the DNR located an additional location of EWM at the Cedars Resort dock. Hand pulling removed the plant. A DNR permit for spot treatment of the boat landing, harvester dock, and the Resort pier was acquired and chemical treatment of these areas was completed. EWM sightings were made but due to late summer sightings, the locations were treated by herbicide or hand pulling during 2017.

Additional EWM sightings were made in 2017 and a grant request for suction removal during 2018 was received. The suction method is best used in early stages of EWM establishment. A full report of the diver aides suction harvesting was prepared upon completion of the project. It successfully removed early development EWM sites. However, a large concentration of EWM was located in Cedar/Northern Bay during the suction operation. It was determined that the

quantity was too large to be removed by the suction method. A permit was received to spot treat this large area and a couple other locations.

Previous 1996 reports of what was thought to be Eurasian Water-milfoil as noted in the Cedar Lake 2004 Weed Cutting Report was found to be Northern Water-milfoil. No Eurasian Water-milfoil was found during Northern Environmental's two lake grid assessments in 2005 and observations in 2006. A follow-up Littoral Zone Survey was performed on August 30, 2007 by Northern Environmental. The purpose of the follow-up was to identify the extent of the Wild Celery Weed in Cedar Bay (a.k.a. Northern Bay) along with recommendations on the control of the problem. Also, the survey was to recheck for infestations of the WDNR reported Eurasian Water Milfoil and the Curly-leaf Pondweed.

(Corrections regarding the incorrect reference to Eurasian Water-milfoil should be noted on the Cedar Lake 2004 Weed Cutting Report.) In early 1993, the WDNR reported a single location of Eurasian Water-milfoil and a single location of Curly Leaf Pondweed. This follow-up survey looked specifically for these two invasive species and could not find any. Specific survey for the plants was performed by Scott Otterson who has been trained in the identification of the two invasive species. No evidence was found for either of the two species in 2008, 2009, or 2010. Due to the lack of spread of the two invasive species from the original WDNR identified locations, the accurate initial identification and existence was questioned. **The WDNR has revised their records to note no Curly Leaf Pondweed exists in Cedar Lake. An effort is being made to accurately indicate a first EWM documentation in 2009 at the boat landing.**

**Current Aquatic Invasives Control efforts and problems:**

Findings of Eurasian Water Milfoil have prompted immediate efforts to control its spread. By improved herbicide treatment and mechanical harvesting. Initially, hand removal was attempted. Spot poisoning was implemented when it was determined that hand pulling alone could not stem the expansion of the plants. Because the lake was in the early stages of attack, a grant request of the WDNR for Diver Aided Suction Harvesting (DASH) efforts was granted. Areas of EWM infestation proved too extensive for DASH methods and herbicide treatment was requested in the dense EWM areas. In 2021, the District received approval for herbicide treatment a large 5-acre EWM patch in North/Cedar Bay. However, approximately 5 acres of small dense EWM spots were not permitted for treatment. Mechanical harvesting and additional harvesters were hired and harvesting hours were expended to attempt to control these areas. These "No Treat" areas have expanded and need more than just mechanical harvesting which spreads cuttings to other areas of the lake.

**A grant Pre-application was submitted for the 2022 treatment of dense EWM areas along with pre and post monitoring. It is anticipated that this grant with provide control of the growing EWM problem. It will also provide valuable data that will impact treatment decisions on thousands of lakes where the EWM spread is beyond hand pulling yet in the early stages where spot treatment can be very effective eliminating a need for a whole lake treatment.**

Increased education efforts consisted of placing paper notices on the windshields of vehicles at the boat landing, physical inspection of boat trailers by volunteers, and presenting informational material and physical examples of the EWM at the Cedar Lake Improvement Association meeting. Due to the initial sighting of the EWM near the boat landing, it appears that offsite boating activities transported the EWM to the lake.

**TOWN OF SCHLESWIG SANITARY DISTRICT NO.1 CEDAR LAKE MANITOWOC COUNTY**

**2021 WEED HARVESTING REPORT**

HARVESTING CHART

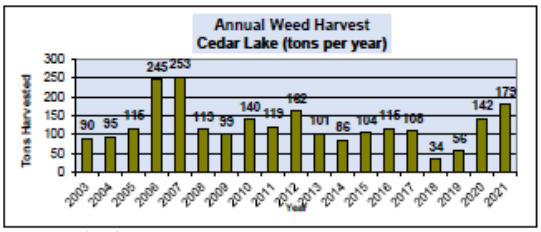
| Year | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Loads Harvester | 40 | 42 | 51 | 109 | 113 | 50 | 44 | 62 | 53 | 72 | 45 | 38 | 46 | 51 | 48 | 15 | 25 | 63 | 80 |
| Tons | 90 | 95 | 115 | 245 | 253 | 113 | 99 | 140 | 119 | 162 | 101 | 86 | 104 | 115 | 108 | 34 | 56 | 142 | 179 |
| Days | 40 | 42 | 55 | 64 | 70 | 40 | 37 | 56 | 49 | 52 | 43 | 38 | 45 | 42 | 48 | 23 | 36 | 71 | 71 |
| Hours | 212 | 223 | 240 | 335 | 310 | 176 | 176 | 260 | 238 | 265 | 190 | 134 | 192 | 213 | 206 | 95 | 104 | 223 | 310 |
| Lbs./Hour | 851 | 848 | 956 | 1,464 | 1,635 | 1,278 | 1,125 | 1,073 | 1,004 | 1,225 | 1,066 | 1,276 | 1,078 | 1,080 | 1,049 | 711 | 1,082 | 1,271 | 1,159 |

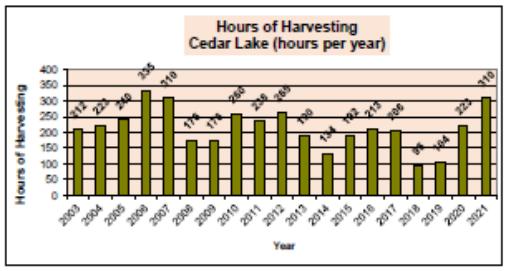
**Notes:**

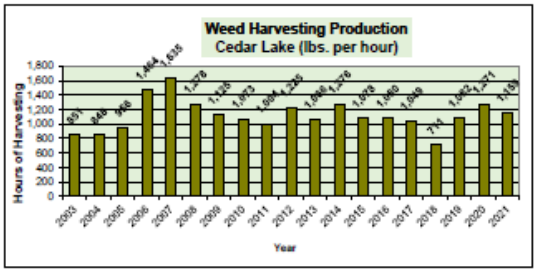
1. Est. 30 lbs. of weeds/cu.ft...
2. Est. 150 cu. ft. per load (harvester load not truck load)
3. Truck replaced wagon for weed hauling in 2005
4. **New weed harvester used in 2006**

**Comments:**

1. Weed removal production increased with the addition of the truck and new harvester. This may partially be due to the collection of a large number of wild celery weed bogs in 2006
2. Weed tonnage removed increased with the increase in hours of removal.
3. The bulk of the loads from mid-August 2007 on were Wild Celery.
4. Record rainfall 2008, no-wake, lack of Wild Celery Weed bogs dislodged limited harvest
5. More Wild Celery Weed patches noted around lake. First ID of EWM at boat landing 2011
6. 2012 truck loads may have been larger than typical
7. Most of the weeds were Illinois Pondweed or similar in 2013 fewer Wild Celery
8. 2016 Most elodea bogs noted in 21 years of observation, higher than normal celery weed
9. 2017 No significant elodea bogs noted. Low to normal wild celery bogs high lake level
10. 2018 Diver Assisted Suction Harvesting efforts reduced the number of harvesting hours. Wild Celery bogs weren't bad this year. Lake level was high.
11. 2020 80% of North Bay was EWM
12. 6 inches of rain in 12 hrs (5 inches is 100 yr event) July 14, 2021 North Bay Was treated with very good success with Procellicor PC




**Sanitary District No. 1's 2021 Lake Improvement Accomplishments:**

1. Herbicide treatment of EWM occurred with volunteers locating additional EWM sites,
2. Monitoring of plant community begin update of the Aquatic Plant Management Plan,
3. Submitted a pre-application for the management of the EWM,
4. Removed Curley Leaf Pondweed as Cedar Lake invasive plant from DNR listing,
5. Sanitary District Commissioner Scott Otterson performed sampling for chlorophyll, Phosphorus, Lake Temperature over Depth, and Secchi Disc readings,
6. Attended the virtual 44rd Annual Wisconsin Lakes Convention,
7. Native plant plot established in 2010 was maintained near the Harvester Building located in Cedar Lake Watershed with excellent results,
8. A Boat Cleaning Station was maintained at the Boat Landing,
9. Clean boats inspections were made totaling 186 hours,
10. A Life Preserver Loaner Station and was maintained at the Boat Landing,
11. USCG Auxiliary was scheduled and provided boat inspections
12. Hired 4 additional harvester operators and attended training course

**Proposed Activities in 2022:**

1. Review the APMP and update and implement the recommendations,
2. Perform another plant and diversity study,
3. Review options for stemming the spread of EWM,
4. Continue efforts to prevent establishment, locate and eradicate any invasive species; specifically, Eurasian Water-milfoil and Curly Leaf Pondweed,

5. Revise DNR invasive listing of first EWM sighting from 1996 to 2009,
6. Continued water quality monitoring to provide a database for the evaluation of the lake's water quality progression and direction,
7. Monitor surface water runoff for Phosphorus and possible need for treatment project,
8. Develop a lake water budget from available data to better understand Cedar Lake levels,
9. Attend the 45th Annual Wisconsin Lakes Convention,
10. Actively participate by the Sanitary District members in the Cedar Lake Improvement Association will provide education of the membership on key environmental issues; non-phosphorus fertilizer, shoreline buffers, lake quality, etc.
11. Continue USCG Auxiliary boater inspection and education program,
12. Continue the Clean Boats inspections.

Continued study and education will be needed to maintain a high level of beneficial use of Cedar Lake.

Sincerely,

Scott Otterson, P.E.
Sanitary District Commissioner

Attachments; Weed Harvesting Chart with Graphs
Cedar Lake Weed Harvesting Map
Muskrat Trapping Chart
Cedar Lake Improvement Association Lake Map and Directory

Cc: Mike Strebe, Sanitary District Chairman John Brotz, Sanitary District Commissioner