

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

October 27, 2015

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

Re; Weed Cutting Report – 2015
Town of Schleswig Sanitary District No. 1
Cedar Lake, Manitowoc County

Dear Ms: Gansberg,

This is the 2015 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.

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 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 is in the process of preparing a Grant Application to develop an updated Aquatic Management Plan. It is anticipated that the plan will be implemented in 2016 and will identify changes in the aquatic plant community.

In conjunction with the Plan update, a Grant Application for a replacement Aquatic Plant Harvester will be prepared and submitted. The current harvester is ten years old and is showing its age requiring increasing maintenance costs and down time.

Weed Cutting Conditions, Observations and Operations:

Lake Conditions and Observations

Ice left the lake on March 30th which is close to the average ice off.

The lake's level was within six inches of the outlet invert until July 18th when the 500 gallon per minute high capacity well was turned on. It continued to pump until the lake level rose to 6 inches below the culvert invert. It was turned off on September 9th.

Wild Celery plant growth appeared in several areas of the lake where it had not been previously seen. There seemed to be more Wild Celery bogs than last year. The harvesting of Illinois Pondweed (or similar looking pondweed) appeared to be the predominant plant harvested through most of the summer. This increase of the native pondweed is a change from the predominant Wild Celery over the last 6 years. Prior to the increase of the Wild Celery, Native Northern Water Milfoil was the predominant species harvested. Possibly the harvesting of the Wild Celery bogs uprooted in Northern Bay in 2006 and 2007 resulted in a delayed reestablishment of the Wild Celery in the uprooted silty muck area of the Bay.

The prior two years, the numbers of muskrats trapped on the lake have been low which might indicate the reason for the absence of the large number of wild celery bogs encountered in past years when the number of muskrats trapped on the lake where high. Muskrat sightings and trapping were up this year which may be the cause of a higher number of bogs encountered this year.

Plant Cutting Operations

The mechanical weed harvester was operated by Roger Laack. Roger has a thorough understanding of the weed cutters operational capabilities and limitations. His knowledge includes the identification of Eurasian milfoil and location of emergent species which are not to be disturbed. Roger was also instructed on the harvesting permit conditions.

The weed cutter operation was primarily Monday through Friday during hours of no wake boating; 8:00 am – 11:00 am.

Weed cutting locations were substantially limited to the 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. Pondweed (non-invasive species) was the primary harvested plant in June, July and the first two weeks in August. Wild Celery Weed was the major plant species removed in August and September.

Mild algae growth with no major blooms was noted through the summer. The secchi disk readings from June through September ranged from a high of 15.6 ft to a low of 11.8 ft.

Weed Cutting Results:

The attached 2015 Weed Harvesting Logs identify that weeds were cut and harvested over 45 days resulting in 46 harvester loads of weeds taken for disposal and use 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 2015 was 103 tons (46 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 and the increased productivity by the upgrading of harvesting and transport equipment. The 2015 harvesting production seems to be stable. 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 Wild Celery in late August/September. Harvesting occurred primarily along the shoreline in lake depths of 12 ft to 5 ft with the cutting blade extendable to a maximum depth of 5ft or a maximum depth of one-half of the water column, whichever was less. Observations indicated that populations of Pond Weed and Northern Water-milfoil 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. More bogs were noted this year in Northern Bay compared to last year. It may be due to increased muskrat population and larger plant colonies becoming dislodged from the silty lake bottom. 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 Wild Celery 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.

Invasive Species:

In the spring of 2011, 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. During 2012, hand removal followed up with an aquatic herbicide application has proved temporarily effective. However, the Eurasian Milfoil was identified 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 initial 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.

Increased education efforts consisting 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 has been implemented. Due to the initial sighting of the EWM near the boat landing, it appears that offsite boating activities transported the EWM to the lake.

Previous 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 should be questioned until it has been verified.

Sanitary District No. 1's 2015 Lake Improvement Accomplishments:

1. EWM sightings from citizen and DNR searches prompted hand pulling and Aquatic herbicide application near the boat landing, and the NE and SE corners of the Big Island,
2. Invasive species notification and boat cleaning requirement notes placed on vehicles in the trailer parking lot and volunteers inspected boat trailers,
3. Provided EWM information and had a volunteer lake inspection day resulting in finding new location of EWM aiding in eradication efforts.
4. Sanitary District Commissioner Scott Otterson performed sampling for Chlorophyll, Phosphorus, and Secchi Disc depth,
5. Sanitary District Commissioners Dick Jens, John Brotz, and Scott Otterson attended the 38th Annual Wisconsin Lakes Convention,
6. Native plant plot established in 2010 was maintained near the Harvester Building located in Cedar Lake Watershed with excellent results,
6. US Coast Guard Auxiliary performed voluntary boat inspections on over 21 boats in an effort to educate boaters on safety and current boating rules.
7. Maintained a Boat Cleaning Station at the Boat Landing
8. Maintained a Life Preserver Loaner Station and a Boat Cleaning Station at the Boat Landing,
9. Develop a better technical resource for assessing the potential for impacts caused by wave boarding boats. Wave boarding boats on Cedar Lake has caused concern on the impacts of this new lake activity. The use of these boats develop a slow moving, large wake that may conflict with the lakes size, current usage, geometry and depth by creating the potential for safety issues, shoreland erosion, property damage, disruption of the lakebed and suspension of lake sediment. Creating this resource will aid in determining if additional restrictions will aid in preserving the delicate resource.

Proposed Activities in 2015/2016:

1. It is anticipated that the Wild Celery weed will remain a problem. Review of the weed development, boating effects on the dislodging of the weed bogs, and spread of the weed need to be reviewed to determine the extremity of the problem, and develop a plan of action,
2. Continued effort will be made to prevent establishment, locate and eradicate any invasive species; specifically, Eurasian Water-milfoil and Curly Leaf Pondweed,
3. Continued water quality monitoring will take place to provide a database for the evaluation of the lake's water quality progression and direction,
4. Attendance at the 39th Annual Wisconsin Lakes Convention is anticipated,
5. Active participation 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.
6. Continue USCG Auxiliary boater inspection and education program.
7. Gather further information on Wave Boarding and the resulting effects to the lake environment.
8. Apply for a Aquatic Plant Management Plan update Grant
9. Apply for an Aquatic Plant Harvester Grant.

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

Sincerely,

Scott Otterson
Sanitary District Commissioner

Attachments; Weed Harvesting Logs – 2015
Weed Harvesting Chart with Graphs
Cedar Lake Weed Harvesting Map
Cedar Lake Improvement Association Lake Map and Directory

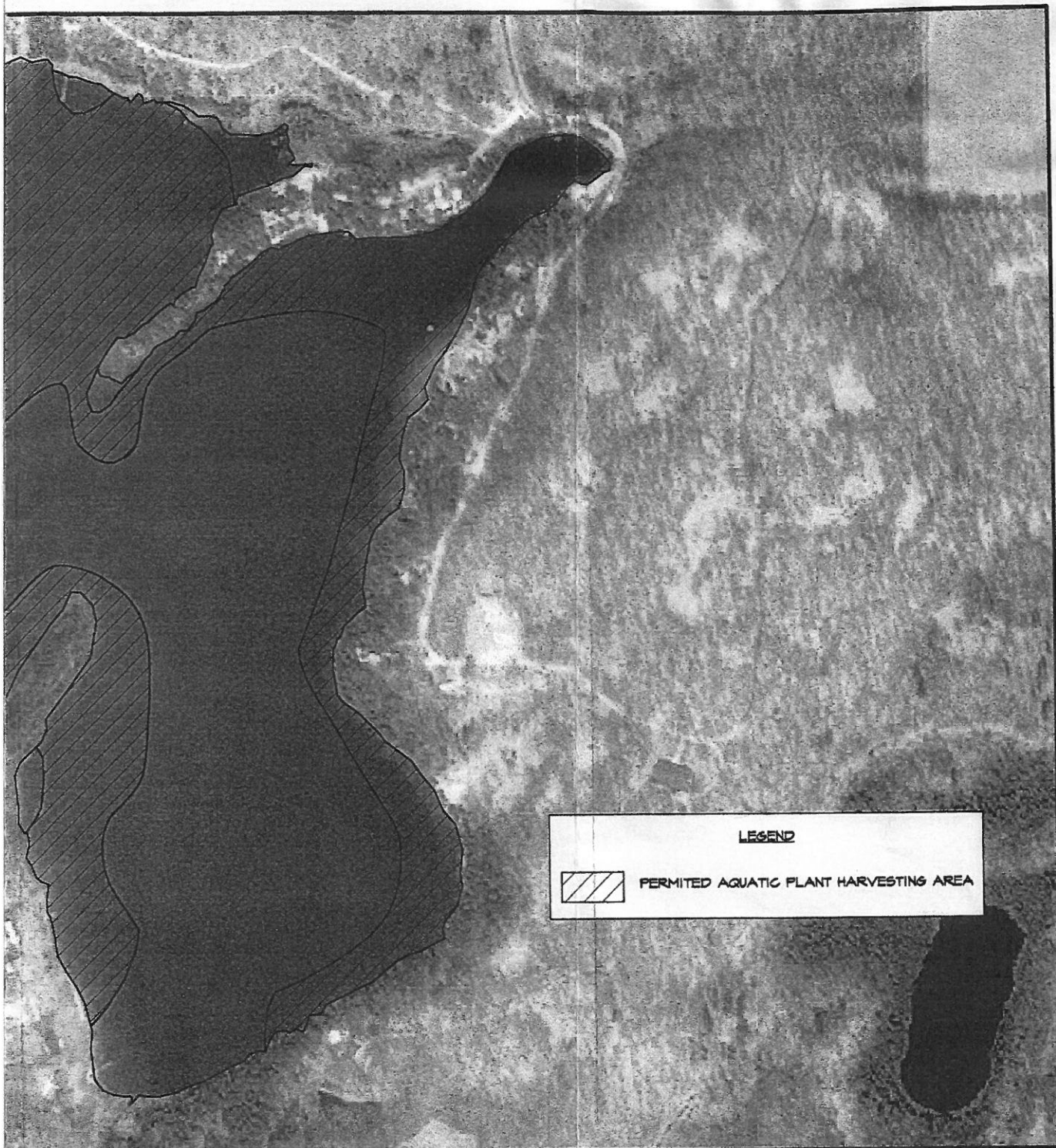
Cc; Dick Jens, Sanitary District Chairman
John Brotz, Sanitary District Commissioner



SCALE IN FEET
200 0 200 400



NOTES: 1. THE DISTRICT MAY ONLY HARVEST WITHIN THE SHADED AREA FOR PIER ACCESS, SWIMMING ACCESS AND BOAT NAVIGATION LANES.
2. NO HARVESTING IN LESS THAN 3 FEET OF WATER IS ALLOWED
3. HARVESTING IS ONLY ALLOWED TO CUT HALF THE TOTAL WATER COLUMN DEPTH.



LEGEND



PERMITTED AQUATIC PLANT HARVESTING AREA

▲ Northern Environmental

Hydrologists • Engineers • Surveyors • Scientists

1203 Storbeck Drive, Waupun, Wisconsin 53963

Phone: 800-498-3921 Fax: 920-324-3023

WISCONSIN ▲ MICHIGAN ▲ ILLINOIS ▲ IOWA

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**AQUATIC PLANT
HARVESTING AREAS**

**TOWN OF SCHLESWIG SANITARY DISTRICT #1
CEDAR LAKE
MANITOWOC COUNTY, WISCONSIN**

DATE: 10/12/05

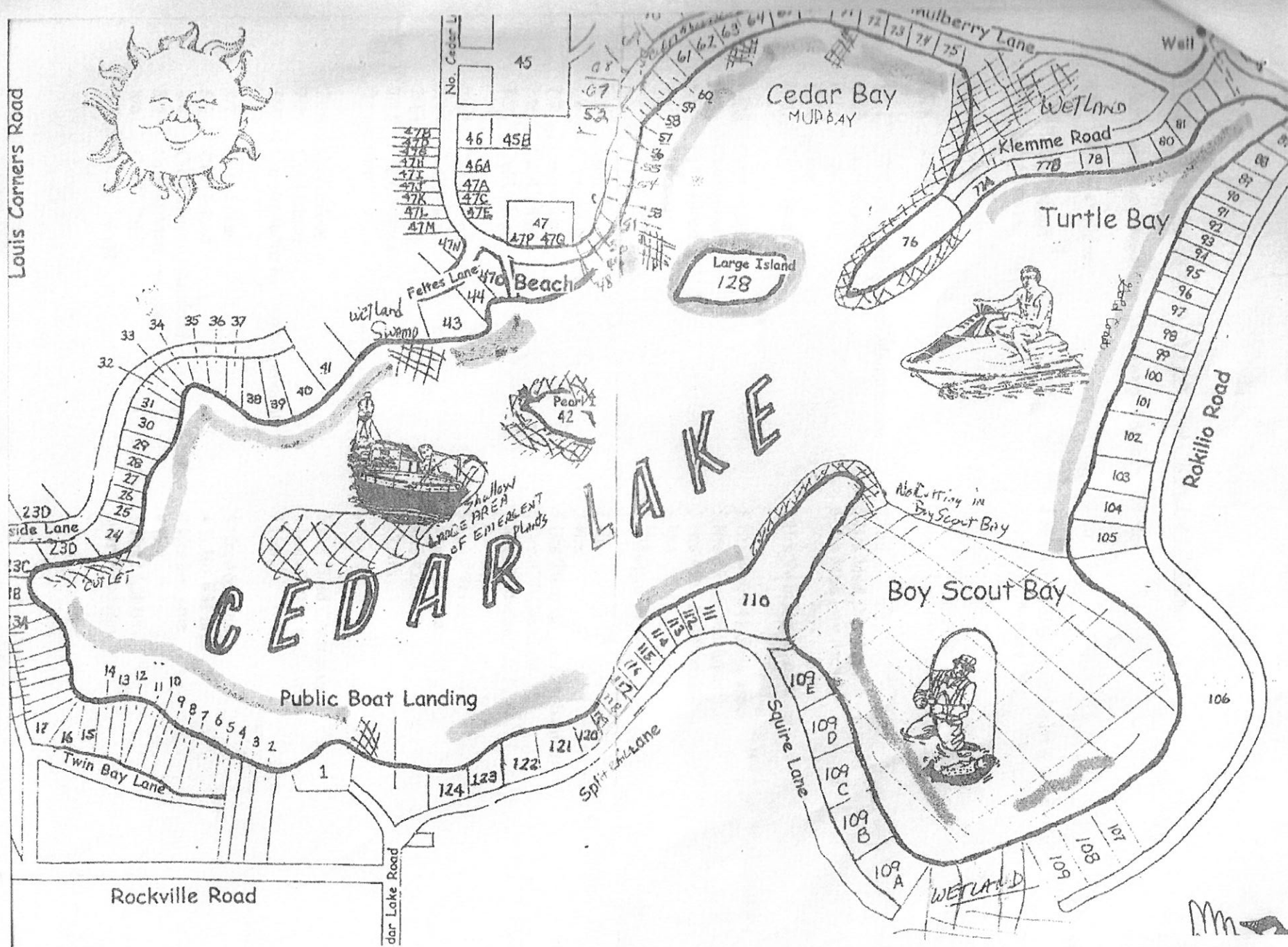
DRAWN BY: DDP

TASK NUMBER: XXX

PROJECT NUMBER: CELO8-3100-0685

FIGURE 8

Louis Corners Road



CEDAR

LAKE

Cedar Bay
MUD BAY

Turtle Bay

Boy Scout Bay

Public Boat Landing

Rockville Road

Cedar Lane

Fettes Lane

Klemme Road

Rokilio Road

Squire Lane

Twin Bay Lane

Large Island
128

Wetland
Swamp

Wetland

Wetland

No Cutting in
Boy Scout Bay

Shallow
Large Area
of Emergent
Plants

Peony
42

Beach

45

46

45B

46A

47A

47C

47E

47

47P 47Q

47M

47N

43

44

40

39

38

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23D

23C

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2015 Weed Harvesting Report

HARVESTING CHART

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Loads													
Harvester	40	42	51	109	112.5	50	44	62	53	72	45	38	46
Tons	90	94.5	115	245	253	112.5	99	139.5	119.25	162	101.25	85.5	103.5
Days	40	42	55	64	70	40	37	56	49	52	43	38	45
Hours	211.5	223	240	335	309.5	176	176	260	237.5	264.5	190	134	192
Lbs./Hour	851	848	956	1464	1635	1278	1125	1073	1004	1225	1066	1276	1078

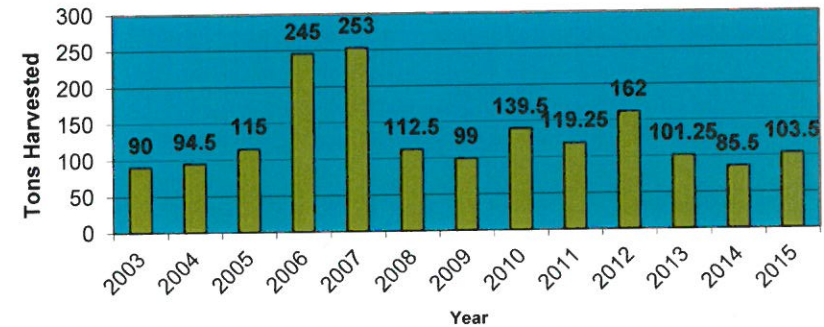
Notes:

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

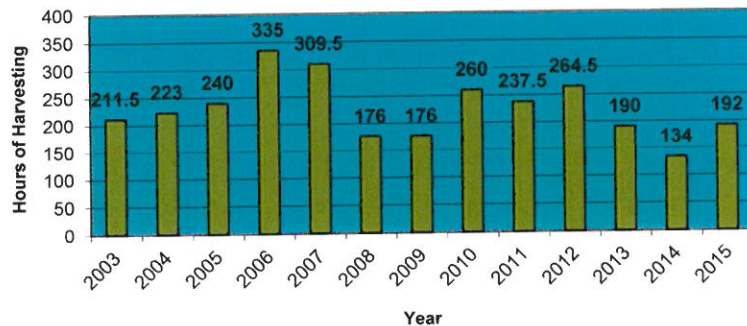
Comments:

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

**Annual Weed Harvest
Cedar Lake (tons per year)**



**Hours of Harvesting
Cedar Lake (hours per year)**



**Weed Harvesting Production
Cedar Lake (lbs per hour)**

