Clam Lakes (Lower & Upper), Burnett County Four-Phased Lake Management Planning Project Description

Lake and Watershed Characteristics

The Clam Lakes are a combined 1544 acres with Upper Clam Lake essentially four times the size of Lower Clam Lake at 1207 acres. They are located in central Burnett County east of Siren. State Highway 70 goes through the "narrows" which separates the two bodies of water. Both lakes are considered shallow, eutrophic, drainage lakes. Upper Clam Lake has a maximum depth of 11-ft with an average depth of 5-ft. Lower Clam Lake has a maximum depth of 14-ft with an average depth of 7-ft. The Clam River flows through both lakes and is impounded approximately 2 miles downstream from the Lower Clam Lake outlet. Water level in both lakes is maintained by a ten hydraulic-foot dam structure owned by Burnett County. In 1965, the structure was only 4-ft high and flow over the structure was estimated at 165 cfs. Both lakes have a direct drainage area to lake surface area ratio of approximately 4 to 1. Because of the Clam River, the watersheds for both lakes total approximately 258 sq. miles. Land cover inside the watershed is approximately 50 % forested, 19% wetland, 18% grassland, and 4% agriculture.

The shoreline of both lakes is heavily developed except in those areas where large wetland complexes of approximately 40 acres exist on Lower and approximately 370 acres exist on Upper. Public access is available on Lower Clam Lake at four different places including the Clam Dam County Park, Hwy 70 Wayside and Public Access Facility, and two smaller access points on the north side of the lake. Access on Upper Clam Lake consists of a State DNR Landing and two smaller landings on the east and west shores. Access can be gained to both lakes from any public access. There is combined parking availability of approximately 90 sites which exceeds maximum public access requirements of around 52 parking sites for a surface water area of 1544 acres. There is a St. Croix Tribal Reservation on the southeast side of Upper Clam Lake.

Clam Dam County Park and the Hwy 70 Wayside provide recreational activities beyond fishing and boating. Both facilities have picnic grounds, public restroom facilities, and shelters.

The Clam Lakes Protection and Rehabilitation District (CLPRD) has been in existence since 1970 and currently includes about 400 properties under its taxing authority.

Existing Lake Conditions

The Clam Lakes have only been a part of the Citizen Lake Monitoring Network (CLMN) since late summer 2008. Both lakes currently have one site each being monitored for water clarity using a Secchi disk as a part of the CLMN. The St. Croix Tribal Department of Natural Resources has been collecting water quality data on the two lakes for several years. Data from the Surface Water Inventory book for Burnett County lists Secchi reading of 3-5 ft in May, 1965. TSI values for phosphorous are in the upper 50's, low 60's.

Both lakes have a severe problem with curly-leaf pondweed (CLP), an aquatic invasive species (AIS), in the spring and early summer. The CLPRD owns, operates, and maintains several plant harvesters. At least one of the Harvesters uses GPS technology to

help guide its path. Large-scale mechanical harvesting is done to remove the dense mats of CLP that form in the lakes from May through June. Later season mechanical harvesting is completed to control nuisance level growth of native vegetation like coontail. The current Aquatic Plant Management (APM) Plan for both lakes was created in 1991 and has had only a few minor modifications since.

Both lakes are popular fishing destinations for bass, panfish, and northern pike. Walleye fishing is erratic. There are four active resorts, three on Lower and one on Upper that cater to fishermen and other lake enthusiasts. In recent years, fishermen and local residents have complained about what they see as an increasing carp population. The two lakes get a lot of ice fishing pressure in the winter.

Wild rice is abundant, particularly in Upper Clam Lake. Wild rice is an extremely important natural resource and great efforts have been made to protect and enhance its growth in the Clam Lakes. According to the St. Croix Tribal DNR, historically the rice beds on the two lakes have been some of the highest producing beds in Wisconsin. Recent years have shown a significant decline in production from these beds. The exact cause of this decline is unknown, but one theory is that the increased carp population has impacted the beds.

Public Participation

The CLPRD realizes that involving all stakeholders in this project is pivotal to its success. Stakeholders include but are not limited to those individuals, families, and businesses that are included in the taxing area, other lake users, the St. Croix Band of the Chippewa Nation, the Great Lakes Indian Fish and Wildlife Commission, Burnett County, local Townships, and the WDNR. All actions provided for in this grant application and project description have been presented to the CLPRD Board on numerous occasions for review and modification. They will also be presented to the CLPRD as a whole in a spring meeting of the membership. Many of the activities included in this project description have been discussed with the WDNR and St. Croix Tribal representatives.

A Lake User Survey will be prepared to gain a better understanding of the issues and concerns facing the Clam Lakes and their users. The current plant harvesting plan, potential alternative management strategies for CLP and other AIS, native plant control, wild rice, water quality and lake conditions, lake use, and individual support for the actions discussed in this project description will be included. The survey will be distributed to all individuals, families, and businesses included in the taxing authority, and made available to any other concerned individual, party, or other interested stakeholder.

A Lake Education Fair will be held after the Lake User Survey has been completed and evaluated. Issues specific to the survey results will be presented at the Lake Education Fair, along with displays and presentations by Burnett County, the St. Croix Tribe, the WDNR and others related to wild rice, shoreland restoration, aquatic invasive species, and good lake stewardship.

Existing public and private access signage will be evaluated for completeness and effectiveness in conveying a message of lake protection. If necessary, improvements will be made.

The Clam Lakes Protection and Rehabilitation District recently developed a webpage www.clamlakeprd.com and is now using this page to post annual and board meeting minutes, and to provide links to other pertinent sites. This website will be used to distribute information related to this lake management project.

Goals of the Project

The primary goal of this Lake Management Planning Project is to complete a more detailed and updated version of an Aquatic Plant Management Plan for the two lakes. The existing plan was constructed in 1992, and has only received minor updates since then. This plan will consider any changes in the lakes and their watershed over the last 15-20 years, document changes in the aquatic plant community and structure via the whole-lake point-intercept plant survey, evaluate the successes of the existing APM Plan and identify its weaknesses, and evaluate all possible plant management alternatives and their potential for use on the Clam Lakes. It will continue to focus on CLP control in both but also seeks to better focus the control activities in specific areas rather than using only a blanket approach to the whole of both lakes. It will create a rapid-response plan for other invasive species, primarily EWM. The curly-leaf pondweed population in the two lakes will be more closely scrutinized to see if existing management recommendations can be more finely tuned. A CLP turion survey will be completed to aid in this evaluation.

This new plan will also evaluate the need for control and management of native plant species. Documentation of nuisance conditions and navigational impairments caused by native plants will be included if warranted. Upon completion of the PI Plant Survey an FQI value will be determined for the two lakes. A targeted FQI Value will be determined and ways to reach this target goal will be presented. Wild rice will continue to be protected under this plan and greater detail will be given on how to do this.

Existing and potential impacts to water clarity and quality will be assessed, as well as the impacts of current and future management recommendations on fish and wildlife. This APM Plan will set goals for plant management and through its evaluation of existing information identify areas of concern to be addressed in a future Comprehensive Lake Management planning project. Plant management recommendations in this plan will cover at least five years and be implemented upon adoption by the CLPRD and WDNR approval.

A secondary goal for this project is to begin the process of developing a more comprehensive Whole Lake Management Plan in addition to an APM Plan. An APM Plan is typically just one part of a Whole-Lake Management Plan. Water quality in the two lakes is directly tied to the nutrient loading in the system. CLP growth and decay is one source of nutrients. Harvesting records, the early season PI plant survey, and turion sampling results will be used to estimate the total nutrient loading caused by CLP. An extensive shoreland evaluation will be completed to determine what portion of the shoreline on both lakes could benefit from restoration activities. Those properties that may benefit from the Burnett County Natural Shorelines Incentives Program will be identified and then contacted by the Lake District and encouraged to participate. Additionally, results from the survey along with county runoff coefficients and precipitation records will be used to estimate total nutrient loading from the near-shore area.

A carp population evaluation will be completed in part by the St. Croix Tribe and the WDNR. Population estimates and growth rates will be used to help determine the impacts of carp on the wild rice beds, aquatic plant beds, and on turbidity caused by re-suspension of the sediments. Lake sturgeon are present in the Clam Lakes and changes in the carp population may impact them.

Educating lake residents related to the identification of and problems caused by aquatic invasive species are a part of this project. Watercraft inspection and in-lake AIS monitoring programs will be developed and implemented in this project. The importance of native plants and wild rice in the Clam Lakes will be transferred to lake residents and users through activities at the public accesses, at a Lake District sponsored Education Fair, and through Lake District meetings and mailings. Good lake stewardship will also be stressed at these functions. The level of understanding by lake residents and users for these and other issues will be determined in a Lake User Survey early in 2009. Results will help to focus educational efforts made by the Lake District and other stakeholders.

The CLPRD will continue to develop a working partnership with the St. Croix Band of the Chippewa Nation, Burnett County, and the WDNR to further develop a comprehensive lake management plan upon completion of this project. Additional Lake Management Planning Grant funding will likely be sought.

Project Description

The following pages provide greater detail for the activities included in this project. All activities are broken down by phase of completion and a timeline is provided. The expected budget for this project is also included. The CLPRD has the ability to levy taxes to support this project however; it is assumed that much of the required match for state planning grant funding will be made by volunteer time and donated services, insuring general public participation.

The project will be divided into four phases:

Phase 1 – Point Intercept Plant Surveys & Education

The first phase would be completed during the 2009 open water season with an end date of February 1, 2010, and will include:

- A whole-lake point-intercept aquatic plant survey both in the spring to identify the extent and density of curly-leaf pondweed growth, and a late summer survey to identify the extent and density of native plant species on both Upper and Lower Clam Lakes
- Expanded water quality testing on both lakes via the CLMN with some additional testing above and beyond the CLMN
- An education component including a watercraft inspection program, aquatic invasive species training and monitoring, and good lake stewardship information
- Kick-off Meeting with the entire Lake District in the spring to get the activities in this project started

Phase 2 – Lake User Survey, Lake Education Fair, and Turion Sampling

The second phase of this project would be completed during the 2009 open water season with an end date of February 1, 2010, and will include:

- Lake User Survey to be completed in the early summer
- Lake Education Fair in the early fall
- Turion Sampling Survey to be completed in the late fall

An evaluation of existing lake access signage to include making improvements if necessary

Phase 3 – Shoreline Survey, Water Quality, Eurasian Watermilfoil Rapid Response Plan, and Fisheries Evaluation

The third phase of this project would be completed during the 2010 open water season with and end date of July 31, 2011, and will include:

- Shoreline Survey of both lakes
- Additional water quality information
- Fisheries survey done by the St. Croix Tribe to better understand the carp interaction in the system
- Development of a Eurasian Watermilfoil Rapid Response Plan

Phase 4 – Aquatic Plant Management (APM) Plan for Both Lakes, Education, and Wild Rice Survey

The final phase of this project would be completed in the fall of 2010 with an estimated end date of July 31, 2011, and will include:

- A complete (updated) 5-year APM Plan presented to the Lake District and the DNR for approval by December 1, 2010. The St. Croix Tribal Center in Hertel, WI has a great deal of water quality and general lake information that will be collected and evaluated for this Plan. The Final Plan will include:
  - Analysis of physical characteristics of the Clam Lakes and their watershed
  - Evaluation of existing lake data
  - Compilation of current and past management history
  - Analysis of aquatic plant surveys for both lakes
  - Evaluation of fisheries and wildlife habitat
  - Analysis of water quality data
  - Documentation of aquatic plant problems and their severity
  - Evaluation of all possible aquatic plant management alternatives
  - Incorporation of Lake User survey results into the management plan
  - Aquatic plant management recommendations
  - Rapid-response plan for new invasive species (specifically EWM)
  - 5-year outline of Aquatic Plant Management Control Work
- Wild rice density and bed mapping to be completed by the St. Croix Tribe
- An education component including a watercraft inspection program, aquatic invasive species training and monitoring, and good lake stewardship information

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• Final presentation to members of the Lake District and other interested parties to discuss all management recommendations

Lake User Survey, Curly-Leaf Pondweed (CLP) Turion Sampling, and Shoreline Survey

Several different surveys will be conducted over a two year time frame. The first is an aquatic plant survey of both lakes completed following all WDNR Guidelines. This survey includes an early season CLP survey to identify the extent of CLP growth in the two lakes. It also includes a summer survey covering both lakes to identify all native and non-native aquatic plants present in the lake and determine their density, frequency, and location in the system. This survey will be completed by Endangered Resources Services, LLC.

A Lake User Survey will be completed in the early summer 2009 to include all lake residents and be made available to other interested parties. The purpose of this survey is to seek a better understanding of the many feelings and attitudes of lake residents and users related to their current plant management plan and possible alternatives, lake use, water quality, knowledge of aquatic invasive species, wild rice, and best management practices for lake protection. This survey will be followed up with a Lake Education Fair with guests from the DNR, Burnett County, and the St. Croix Tribe.

CLP turion sampling will be completed in the fall of 2009. Turions are produced in mass by mature CLP plants and provide the base for new growth every year. While the total mass of CLP growth can vary in any given year, the turion base should remain fairly constant. The best time for harvesting CLP is just before the plant has reached the point where turions may be released from the parent plant. The number of turions present in the sediments may indicate if past harvesting was completed at the appropriate time. Once a survey of the number of viable turions has been completed, a baseline for turion density will be established. This baseline information can then be used in the future to help determine the level of success changes to the plant management plan may have. It may be possible to make a comparison between the turion density in the Clam Lakes and the turion density in other lakes where harvesting or other large-scale treatment has not taken place. This kind of comparison can only be made if results from this turion survey indicate extremely high or extremely low turion density as compared to the expected norm in other lakes. If conditions and results are appropriate, this comparison can then be one factor in determining how effective past harvesting programs on the Clam Lakes have been to date. It can also help to more precisely define areas in the two lakes to focus CLP treatment. Areas with extremely dense turion levels may be better served by targeted early season herbicide application rather than harvesting. This evaluation will be completed by Freshwater Scientific Services, LLC.

A Shoreline Survey will be conducted in the early summer 2010. This survey will help determine what portion of the shoreline on both lakes could benefit from restoration activities. Burnett County has a very good Shoreland Restoration incentive program. The survey will identify those parcels that may benefit from the programs Burnett County has to offer. Other parcels may be improved by simple measures the land owner may not be aware of. Results will be used to help target an educational campaign to that end.

Areas experiencing erosion problems will also be identified. Percent and type of land cover, slope, and amount and type development will also be used to establish nutrient loading values from near-shore runoff.

Finally, the St. Croix Band of the Chippewa Nation will work in cooperation with the WDNR to complete a Carp Population Survey on the two lakes. Many residents and lake users believe that the carp population in the lake has increased in recent years and are negatively affecting the lake, including wild rice production. Carp can increase turbidity, root-up native plants, and negatively affect native fish spawning.

The St. Croix Band of the Chippewa Nation will also complete wild rice density and bed mapping of the rice beds in Upper Clam Lake over the course of this project.

Education/Training Programs

Phases 1, 2, and 4 all include educational activities designed to improve the knowledge base of lake residents and users regarding aquatic invasive species, protecting the lake from new introductions of AIS, shoreline restoration, the importance of wild rice and other native plants, and other good Lake Stewardship activities. Volunteer training for the Wisconsin Clean Boats, Clean Waters and CLMN Aquatic Invasive Species "Watch" program will be completed by DNR or UW-Extension Lakes personnel as required by each of these programs. SEH will help volunteers incorporate their training into on-lake action.

SEH will train volunteers from the CLPRD to collect samples and complete additional water quality monitoring at the two lake sites according to the CLMN guidelines and provide support when and if it is needed. Volunteer time helps offset expenses incurred by the Lake District, and insures active involvement by lake owners throughout the entire aquatic plant management plan development project.

Project Funding

Funding for all phases of this project will come from the WDNR Lake Management Planning Grant program. Individual grant projects in this program are capped at $10,000 state share based on a 75/25% cost share. The state will reimburse 75% expenditures incurred by the project up to $10,000.00 provided the sponsor has met the 25% match required with donated time and services, cash outlays, or any combination of these or other eligible contributions. A project larger than $10,000.00 state share can be "phased" up to a total of $100,000 lifetime per sponsor. One organization can apply for up to two lake management planning grants during a single grant eligibility period. It is expected for this project that the four phases will cover two eligible grant periods.

February 1, 2009 Grant Eligibility Period

Phase 1 – $13,328.78 ($9,996.59 state share, $3,332.20 match)
Phase 2 – $12,210.00 ($9,157.50 state share, $3,052.50 match)

August 1, 2009 Grant Eligibility Period

Phase 3 - $9,798.92 ($7,349.19 state share, $2,449.73 match)
Phase 4 - $12,976.00 ($9,732.00 state share, $3,244.00 match)

Total Project costs would be $48,313.70 over two grant periods and two years. Total CLPRD costs would be $12,078.43 over two years, but it is assumed that much of this cost can be offset by volunteer time and donated services. That portion of the sponsor match not met by volunteer time will be met in cash.

Work Plan

Phase 1 (April 1, 2009 – February 1, 2010)

Task 1 – Point-intercept plant surveys (both lakes)
(SEH sub-consultant, ERS)

Task 2 - CLMN water quality sampling on one site in each lake with additional sampling in October and increased DO/Temperature Profile monitoring
(CLPRD, WDNR, and SEH)

Task 3 - Watercraft Inspection at public access points
(CLPRD)

Task 4 - In-lake monitoring for EWM
(CLPRD and SEH)

Phase 2 (April 1, 2009 – February 1st, 2010)

Task 1 – Lake User Survey
(SEH and CLPRD)

Task 2 – Lake Education Fair
(SEH, CLPRD, Burnett County, WDNR, & St. Croix Tribe)

Task 3 – Improved Signage at public access points
(CLPRD and SEH)

Task 4 – Curly-leaf Pondweed Turion Survey in both lakes
(SEH and SEH sub-consultant, FSS)

Phase 3 – (October 1, 2009 – July 31, 2011)

Task 1 – Shoreline Survey (both lakes)
(SEH and CLPRD)

Task 2 – CLMN water quality sampling on one site in each lake with additional sampling in October and increased DO/Temperature Profile monitoring
(CLPRD)

Task 3 – Eurasian Watermilfoil Rapid Response Plan
(SEH)

Task 4 – Carp Survey
(St. Croix Tribe)

Phase 4 – (October 1, 2009 – July 31, 2011)

Task 1 – Aquatic Plant Management Plan for both lakes, submitted for approval by the Lake District and the WDNR by December 1, 2010.
(SEH)

Task 2 – Watercraft Inspection at public access points
(CLPRD)

Task 3 - In-lake monitoring for EWM

(CLPRD and SEH)
Task 4 – Wild Rice Survey and Mapping
(St. Croix Tribe)
Task 5 – Lake User and Landowner Education Plan
(SEH)

Project Timeline

December 2008 – January 2009
SEH and the CLPRD prepare a large-scale four-phased Lake Management Planning Grant

February 1, 2009
CLPRD and SEH submit a large-scale four-phased Lake Management Planning Grant application, Project Description, and proposed budget to the WDNR.

April 2009 – February 2010
Phase 1 of this project is completed.

April 2009 –February 2010
Phase 2 of this project is completed.

August 1, 2009
SEH and CLPRD submit paperwork for Phases 3 and 4 for grant funding.

October 2009 – June 30, 2011
Phase 3 of this project is completed.

October 2009 –June 30, 2011
Phase 4 of this project is completed. A completed Aquatic Plant Management Plan in draft form would be submitted to the WDNR by December 1, 2010.

Project End Date
A final draft form of the new APM Plan for the Clam Lakes will be submitted to the WDNR by December 1st, 2010. However, the entire project is not considered done until the new Aquatic Plant Management Plan for the Clam Lakes has been approved by the WDNR.

Project Deliverables
Upon completion of this project 4 electronic and paper copies of the final APM Plan and Appendices will be provided. At least two electronic and digital copies of each of the reports generated by SEH sub-consultants for their part of this project will be provided, one to the Lake District and one to the WDNR.

Letter of Resolution and Letters of Support

A letter of resolution from the CLPRD and letters of support are included with this Lake Management Planning Grant Application.

Please accept this proposal on behalf of Clam Lakes Protection and Rehabilitation District and rank it accordingly.