Lake George Management Plan

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In cooperation with the
City of River Falls,
the Lake George Management District and
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The development of the Lake George Management Plan is primarily intended to create an ACTION PLAN. This Action Plan clearly represents the next important step in the history of River Falls to move forward in physically and emotionally accomplishing the vision for the long term identity of the community. This vision of the relationship between the City, the River, and the Lake is collectively represented in a number of studies and plans that have been done to date. These studies provide a significant foundation for the Lake George Management Plan to result in a community supported project whose implementation will greatly enhance the long term economic potential, environmental sustainability, and quality of life in the city.

Past evidence of detailed consideration of Lake George, and lake management in general, is referenced in the recent 205j stormwater Management Plan (SEH, 1994), A Model Lake Plan for a Local Community (UW-Ext / DNR, 1994), the Planting & Managing the Urban Forest: Infrastructure & Commonwealth on the Kinnickinnic River (1994), the River Fall's Comprehensive Plan (City Council, 1987), the Lake George Feasibility Study Results & Management Alternatives (WI DNR, 1985), the Lake George Sediment Sampling study (GME Consult, 1990), the Main Street Project Vision 2000 Document (Main Street, 1994), and The Kinnickinnic Priority Watershed Application (St. Croix / Pierce Counties, 1994).

The intent of this plan, among other considerations identified below, is to develop "design concepts which equally consider lake restoration (dredging) and stream restoration.: As such, the final plan will "Choose a workable design solution that overall best promotes the following criteria: a)stormwater management / sediment reduction; b) improvement of fish & wildlife habitat; c) integrates goals of downtown Master Plan; d) elevates public awareness of riverine ecology and management."

This plan is meant to also "Formulate a strategy for successful implementation which includes the following: a) build public support through citizen input / education; b) build support of elected and appointed officials; c) formulate a realistic construction budget for inclusion in capitol improvements

project list / timing; d) identify sources of funding, public and private; e) formulate a plan for physical implementation; and f) integrate plan with UW-River Falls and the River Falls Public School systems environmental family science program."

The plan that we propose, not only meets the basic criteria of the conditions set forth in the RFP, but will go beyond in giving comprehensive consideration for integrating implied concerns for enhancing the economic development potential, recreational opportunity / water access, and overall aesthetics & identity of the community. As well, the plan will maximize support and integration of all of the City's planning documents noted earlier, but especially the Kinnickinnic River Priority Watershed Designation, the 205J Stormwater Study, the Mainstreet Project Vision 2000 goals and objectives.

In the preparation of the Lake George Management Plan the following four baseline alternative management options will be considered.

Alternative Management Options

Alternative I - Do nothing option - this option assumes that Lake George is currently being managed in the most productive manner possible from all viewpoints in terms of collectively maximizing: 1) economic potential to the downtown business district & community as a whole; 2) integration with the City's Comprehensive Plan; 3) management & mitigation of stormwater impact; 4) fish & wildlife habitat; 5) public awareness of riverine ecology & management; 6) aesthetic appeal; & 7) recreational access.

Alternative II - Lake George Dam Removal Option - this option assumes that each of the factors discussed in ALT. I could be best maximized by removing the hydroelectric dam which creates the Lake George impoundment. Besides those criteria, study of this option will include careful

consideration of the cost-benefit analysis of the economic impact the recent dam restoration & the continued generation of electricity from this facility.

Alternative III - Complete Dredging to Restore Lake George to a More "Healthy Lake Ecosystem" Option - this option would consider dredging as the primary means of achieving maximized benefit to the criteria listed in the introduction. Investigation of this option will naturally focus quite carefully on the potential benefits & impacts of disturbing the existing sediments as well as the direct & indirect costs of doing so.

Alternative IV - Constructed Artificial Wetland/Stream Channeling Option - this option would investigate the feasibility of minimal sediment disturbance by constructing a berm that would isolate a large portion of the downtown stormwater impact on the river & the large sediment laden area in the southeast two-thirds of the Lake. This berm would also serve to more directly channel and maintain the cold water habitat productive for trout both in the lake and in the lower Kinnickinnic. This option would naturally consider the physical & economic impacts of such a berm on the operation of the hydroelectric utility of the dam.

BACKGROUND

Previous Studies

The Kinnickinnic River, Lake George and the surrounding watershed have been the subject of numerous studies for several years. Swanson (1976) studied Lake George and it's watershed (figure 1) with specific reference to geology, soils and land use and how these factors related to stream flow, surface water quality and rates of sedimentation.

Swanson (1976) concluded that the sediments in Lake George had been deposited during major flood events and primarily in the years prior to 1960. Since 1960, runoff and erosion control practices in the watershed and streambank erosion control practices on the upper Kinnickinnic River have reduced the rate of sedimentation in Lake George to minimal amounts. Swanson also concluded that because of the mineral rich sediments and shallow water, Lake George had limited value as a lake water resource and alternative management procedures should be pursued.

A Wisconsin Department of Natural Resources study initiated in 1980 identified physical characteristics of Lake George as shown in (Table 1) (Moe 1981).

Figure 1

UPPER KINNICKINNIC WATERSHED

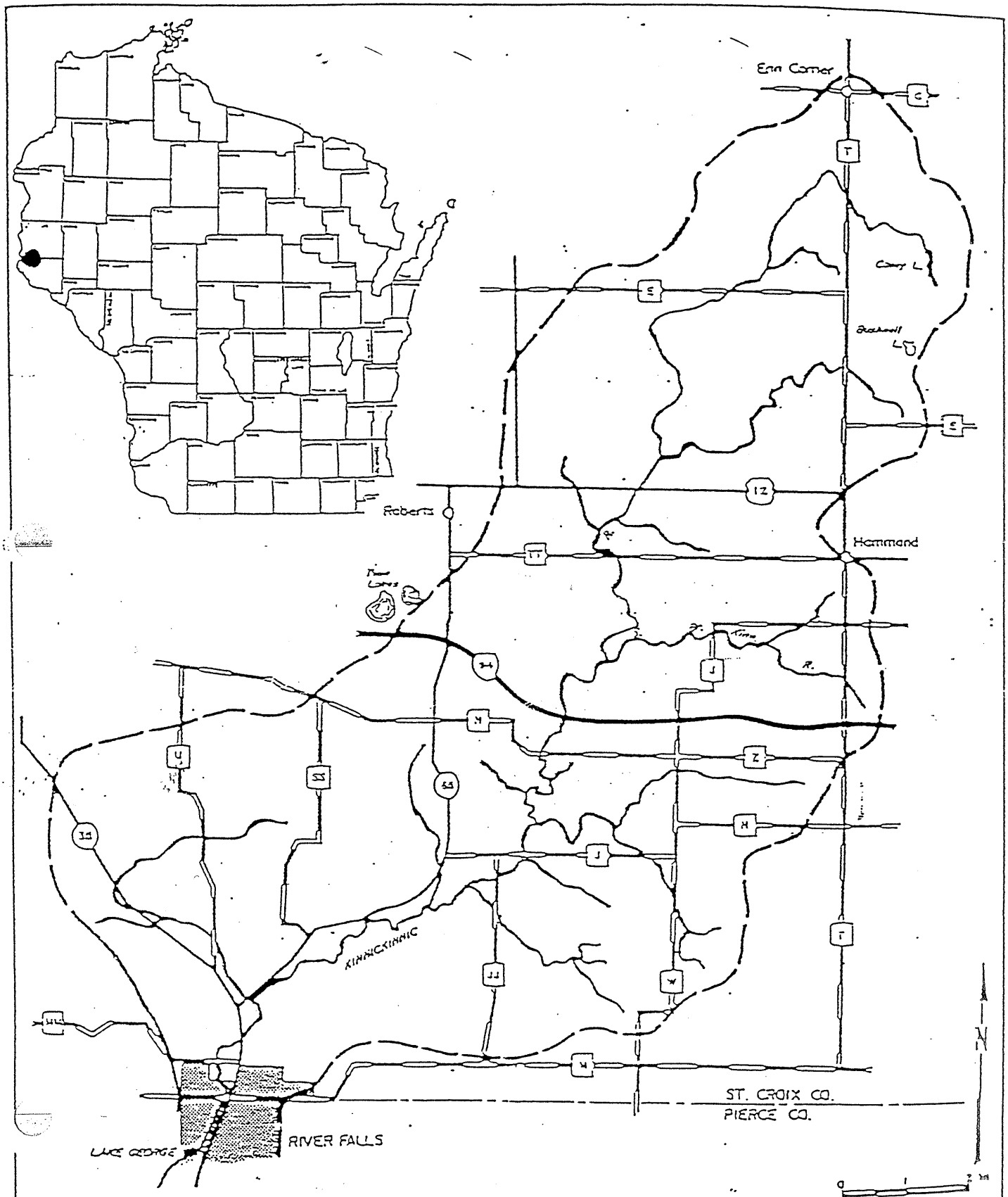


Table 1

Lake George, Pierce County

Watershed Area [1]	65,280 acres
Lake Area	18 acres
Ratio, Watershed to Lake Area	3627:1
Average Outflow [2]	45 $ft.^3$/sec.
Annual Outflow	32,579 acre-feet/year
Lake Volume	94 acre-feet
Maximum Depth	13 feet
Mean Depth (volume/acre)	5 feet
Average Water Residence Time	21 hours

1. As measured by U.S. Army Corps of Engineers
2. Calculated from long-term average runoff as measured by U.S. Geological Survey, all other data measured in feasibility study.

According to Moe (1981), sediment ranges from 0 - 8 feet thick on the bottom of Lake George, generally deeper near the dam. The estimated total volume of soft sediment measured in the 1981 study, is 64, 012 cubic yards. Moe indicates that the material is predominantly fine sand, silt, and clay eroded from the uplands.

The historic rate of sedimentation in Lake George has been quite high starting with the period of intense cultivation during the late 1800's. According to Moe (1981), in the 1950's sediment was accumulating in Lake George at the rate of over 2,500 cubic yards per year. Moe estimates that improved upland soil conservation practices, including extensive stream bank protection, have reduced erosion and the resulting sedimentation, and that today sediment is being deposited in Lake George at a rate of less than 500 cubic yards per year (0.2 inches/year). Moe estimates the

lake's life expectancy is over 300 years. Based on this rate, Moe's 1981 study showed that the top layer of sediments, where aquatic plants root, to be rich in phosphorus. Even without further inflows of phosphorus or sediment, the lake will continue to support abundant plant growth.

According to Moe, overall storm water contributes only a small proportion of the sediment and nutrients delivered to the lake. Moe (1981), found that current nutrient delivery is not a controlling factor in Lake George; rather, the nutrient-rich sediments, deposited years ago, provide the medium for abundant plant growth in Lake George.

According to Moe (1981), water and phosphorus move through Lake George so rapidly (flushing every 21 hours), that current nutrient delivery to the lake is not the controlling factor.

According to Moe (1981), the major nuisance aquatic plant in Lake George is duckweed. Duckweed is a floating plant which forms large mats in areas where the flow of water is slow. Duckweed thrives in the moderately hard, alkaline and nutrient-rich waters of Lake George.

Brown trout, carp, suckers, and a variety of panfish inhabit Lake George, seeking deeper water. Rough fish such as carp are not a problem in Lake George, according to Moe (1981). Cold water temperatures apparently limit rough fish, panfish, and bass populations from being established.

One alternative suggested in the mid 1980's was to dredge an area in Lake George to increase the depth and hopefully improve the fish habitat. Part of this plan also included a fishing peer extending out into the Lake. Any dredging in Lake George requires a permit from the Wisconsin DNR and would be granted only if minimal environmental changes were to occur. One of the concerns of dredging is the concentration of metals such as cadmium, chromium, copper, lead and mercury in the sediments which could be released to the water if disturbance by dredging

were to occur. Therefore before a permit would be issued detailed analysis of sediment is required by the Wisconsin DNR.

GME Consultants, Inc. Minneapolis, Minnesota were contracted by the City of River Falls to collect sediment core samples and have them analyzed according to DNR recommendations.

GME Consultants, Inc., completed the sediment sampling and testing of the Lake George Sediments for the proposed fish habitat dredge area in River Falls. GME's investigation included driving four sample tubes into the lake sediments, and analytical testing of selected sediment samples.

According to GME (1990), about 3.8 to 6.4 feet of dark brown lake bottom sediments existed at the boring locations. GME's 1990 report found the sediments consisted of organic silty sand, organic silt with clay, fine sand with a trace of organics, and sand with silt and a trace of organics. According to GME (1990), this material constitutes lake bottom sediments deposited after the construction of the dam.

GME (1990) found brown and orange fine to medium sand underlying the recent sediments. This material constitutes naturally occurring fluvial soils according to GME.

Dense underlying granular soils or the bedrock surface was encountered at depths ranging from 5.0 to 7.3 feet below original grade.

The Wisconsin DNR requested particle size distribution and tests for total organic carbon, cadmium, chromium, copper, lead, and mercury content be completed (GME, 1990). Table 2 illustrates the results of GME's sediment sampling.

Table 2 - Lake George 1990

Parameter	Range of Results (mg/kg)
Total Organic Carbon	380 to >16,000
Cadmium	<0.25 to 0.35
Chromium	<2.5 to 11
Copper	<0.25 to 6.4
Lead	<2.5 to 15
Mercury	<0.02

Note: These values appear to be well below levels which would be considered as hazardous levels.

Water And Sediment Depth Verification Studies

During the summer of 1995 staff from the University of Wisconsin - River Falls working in cooperation with the Department of Natural Resources and using Department of Natural Resources equipment collected water depth and sediment depth data.

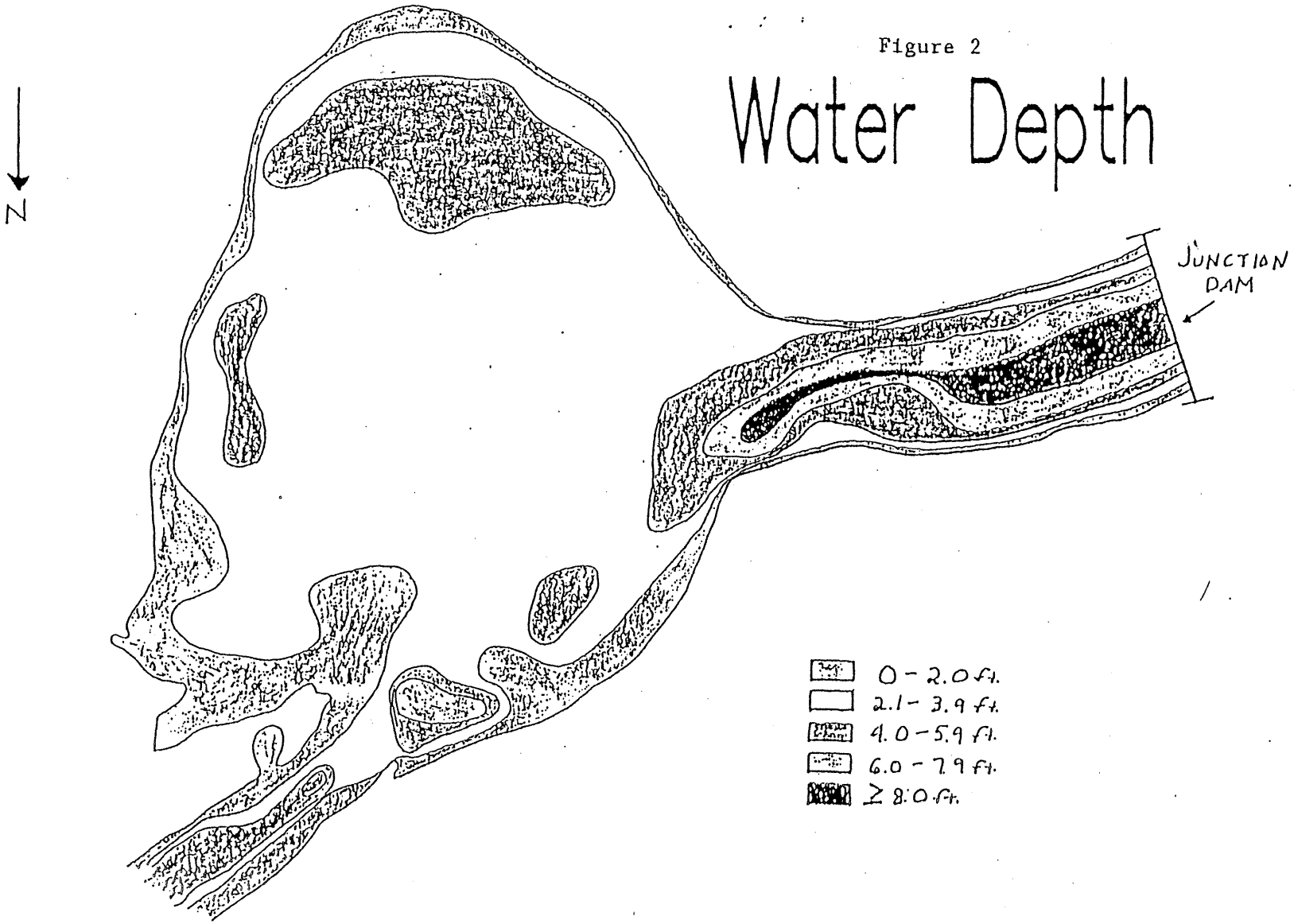
A grid system was set up across the lake at 20 meter intervals in each direction. Water depth was measured by using a specialized pole with a sliding plastic stopper at one end. The sediment thickness was measured by using three eighths inch steel rods of various lengths. The rods were driven into the sediment by hand until contact with the bedrock was made. A total of 123 water depth and sediment depth measurements were taken.

After all of the data on water depth and sediment depth was collected, contour maps of the lake were constructed. Water depth in Lake George is fairly constant. The average water depth is 3.5 feet. It is deeper in the old river channel, parallel to the North shore. Where the channel gets close to the dam the water is the deepest. (see water depth map) Figure 2

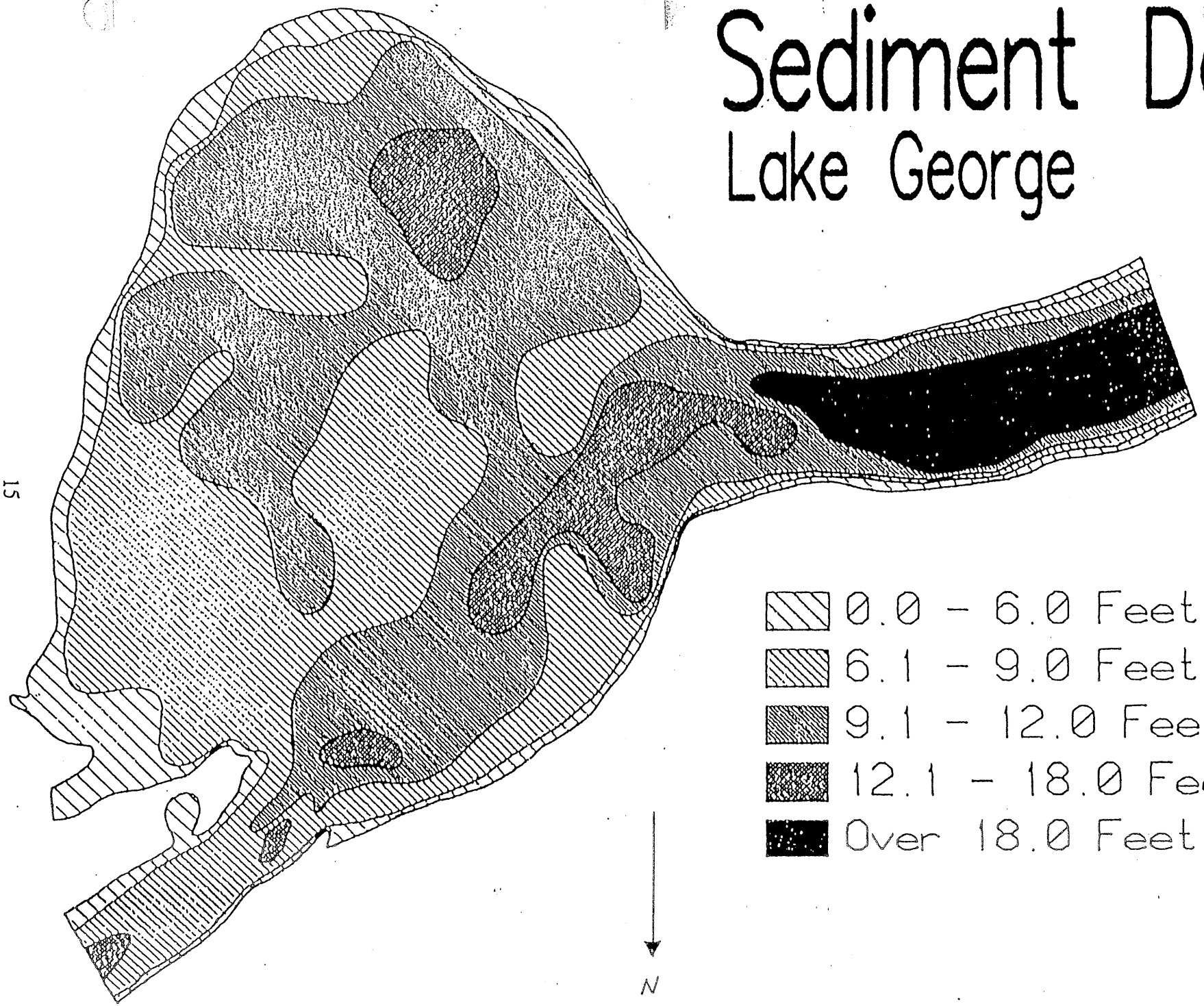
The sediment depth follows the same sort of contour pattern as the water depth. The average sediment depth is 10.3 feet. There is an isolated area on the South side of the lake that has sediment thickness of over 12 feet. The remainder of the deeper sediments are located in the old river channel (see sediment map). Depths of over 20 feet were measured in the center of the channel before the dam. (Figure 3) The variation in sediment thickness map represents the old river channel shoreline that existed before the dam was built. It is also interpreted that there was a meandering stream that followed the 9 foot contour line up into the South end of the lake area. The deep sediment deposits in the channel before the dam are thicker due to the down sloping topography caused by the once fast moving river cutting through the Prairie du Chien formation outcropping in that area. There was probably a natural waterfall or a series of natural waterfalls in that area of the channel prior to the construction of the dam.

Figure 2

Water Depth



Sediment Depth
Lake George



Sediment Core Sampling For Cadmium, Chromium, Particle Size, And Organic Matter Content Analysis

To further clarify concentrations of cadmium and chromium in the Lake George sediments.. Three sediment core sample sites were selected based on sample sites from previous studies (Moe, 1981) and (GME 1989) See (figure) 4 Lake George core sediment sampling sites. With the assistance of Barr Engineering and guidance and equipment from the DNR three six foot core samples were collected in August, 1995. Each six foot core was separated into three two foot sections and sampled for determination of cadmium, chromium, particle size analysis and organic matter content. Samples for cadmium and chromium were taken according to DNR recommended procedures, placed in sterilized chemically clean sample bottles and sent to the State of Wisconsin Hygiene Laboratory in Madison for analyses. Particle site analysis and organic matter content determination were performed in the Soils Laboratory, University of Wisconsin - River Falls. Results of the analysis are presented in Table 3.

Fig. 4: Area of Study
Lake George, River Falls, WI

Table 3: Results of Chemical, Particle Size and % OM Analyses

Sample #	Cd mg/kg	Cr mg/kg	% silt & clay	% OM
T1	0.42	23	24	2.79
M1	0.40	19	26	1.95
B1	0.44	22	28	2.85
T2	0.06	5.4	20	0.88
M2	0.03	4.6	4	0.41
B2	0.03	4.4	4	1.15
T3	0.25	17	28	2.42
M3	0.05	7	6	2.19
B3	0.03	4.5	4	0.30

Sample designation T, M, B, refers to the top 2 feet, middle 2 feet or bottom 2 foot section. The number refers to the core sample site 1, 2 or 3. As would be expected there is direct relationships between the concentration of Cd and Cr and silt and clay and organic matter. Silt and clay particles and organic matter attract metals such as Cd and Cr retain them in the sediment. In comparison sediment samples which were primarily sand with lower organic matter content contained lower concentrations. All concentration of chromium and cadmium are what you would expect in sediments in a Wisconsin mill pond like Lake George. All concentrations are well below the concentration which might be considered hazardous for aquatic ecosystems or human exposure.

As per letter from Paul LaLiberte, Wisconsin DNR all concentrations are below levels of any concern and therefore do not limit sediment dredging, movement disturbances which might be included in the lake management recommendations.

PUBLIC OPINION SURVEY

In July of 1995 a telephone survey of 300 River Falls residents was conducted to ask their opinions of Lake George near downtown River Falls. Calls were made to local residents selected at random from the River Falls telephone directory. Individuals who had never been to Lake George or who had no knowledge of the lake were not surveyed.

The survey questionnaire was developed by Roger A. Swanson incorporating questions to determine River Falls community residents' perception of the Lake George Kinnickinnic River area; to determine how they viewed the economic value of this water resource and what they would like to see done to improve its attractiveness, recreational use, and economic value to the River Falls community.

The survey was conducted by the Survey Center located in the Agricultural Resources Center at UW - River Falls campus. The Center is located in the Rural Development Institute on the UW-River Falls campus. The Center is directed by Dr. Larry B. Swain and conducts a wide variety of surveys utilizing trained callers who conduct the surveys. Calls are made between 4:30 PM and 8:30 PM, the time determined to be most effective and representative of the population.

It was determined that a sample size of 300 completed surveys would give a confidence level of 95% in the data. A random dispersed sample was selected from household numbers in the River Falls area. Only residential numbers were called and whoever answered the telephone (adult or youth over 14) was asked to answer the survey questions.

Three major questions were asked of the respondents. The first question consisted of three parts and was designed to get perceptions of participants about Lake George. One part was to determine what they thought about the aesthetic value of Lake George and the Kinnickinnic River. The results indicated that

60% of the respondents felt the aesthetics of Lake George and the Kinnickinnic River is somewhat or very appealing while only 22% thought they were unappealing.

The second part of the first question referred to their perception of the downtown economic value. Forty five percent of those who participated in the survey indicated that the lake and river had some or large economic benefit to downtown. Twenty four percent thought the lake and river had no value economically and 2% thought it had a negative affect.

The third part of the first question asked if they currently used the river or lake for recreational purposes. 68% use the White Kinnickinnic Pathway, 63% use the area for wildlife observation, 34% fish either the river or the lake, 14% do canoeing and 7% do some tubing on the lake or river.

The second major question asked what participants thought should be done to improve the overall value of Lake George to the River Falls community. Respondents were asked to rank their first three choices in order of importance. A list of suggested choices was given to participants and they were also able to add anything they preferred. The following suggestions were ranked either one, two or three by the participants. The percentage indicates how many of the 300 people surveyed ranked that choice in their top three choices. First, with 75% of total, is to complete the trail system around the lake. Second, with 74%, mention is to improve the natural environment by landscaping. Third, with 55%, is to improve the wildlife habitat. Fourth, is to improve fish habitat with 47% mention. 21% mentioned adding a public dock for boating access. Finally, 8% said to do nothing to the area.

The third major question asked was open-ended and asked respondents to say in their own words what they would like to see done with the Lake George Kinnickinnic River area. The results indicated that 22% suggested cleaning up the area and making it more attractive. 8% said to dredge the lake and clean up the sediment problem. Making the lake more accessible was suggested by 6% of those surveyed. Cleaning up the water and improving water quality was mentioned by 5% of those surveyed. Another

3% said to complete the trail, and yet another 3% said to do nothing. Two percent suggested that the downtown businesses turn their business establishments around to face the lake and 2% also suggested to make the lake deeper. Numerous other comments were made individually and are listed in the results in addendum B.

The results of the survey indicate that residents are aware of and interested in both Lake George and the Kinnickinnic River. Citizens use the lake and river for many purposes and are concerned about its future and its value to the community.

RIVER FALLS MIDDLE SCHOOL - LAKE GEORGE - ADOPT-A-LAKE PROGRAM

Another very important part of community involvement with Lake George is getting the public school involved. Science classes at the River Falls Middle School taught by Jean Ritzinger and Ray Donatell use Lake George for class projects such as water quality measurement, temperature monitoring, aquatic plant surveys and fish habitat evaluation.

Joint activities involving UW faculty, public school teachers and junior high students have generated considerable interest in Lake George and an increased overall awareness.

To more formally recognize this lake connection the River Falls Middle School is participating in the State of Wisconsin "Adopt-A-Lake" program. Adopt-A-Lake is an interdisciplinary program which encourages youth to learn about inland lakes in Wisconsin while actively working to protect those resources, especially through hands-on activities. The program also encourages youth and adults to work in collaboration to protect lakes in their community. Through this program the school and Lake George will get statewide recognition and access to additional resources for use in the Environmental Education Curriculum.

RECOMMENDATIONS

The recommendations presented have been developed in response to the four alternative management options as detailed in the City's Request for Proposal and by the Wisconsin Department of Natural Resources funding document and as described on page 5 and 6 of this document.

Alternative I - Do Nothing Option

Alternative II - Lake George Dam Removal Option

Alternative III - Complete Dredging of Lake George

Alternative IV - Constructed Artificial Wetland/Stream Channeling Option

The recommendations developed reflect years of study by the Wisconsin Department of Natural Resources, contracted private consulting firms and the University of Wisconsin-River Falls. The history of the relationship between the city of River Falls, the river and Lake George is reflected in these previous studies and actions that have occurred over the years. The first dam forming the Lake George impoundment was built in 1864 as a privately owned structure, washed out in the flood of 1894 and rebuilt and acquired by the City of River Falls in 1900. Since Lake George is an impoundment and not a natural lake, the City of River Fall, in 1900, purchased property rights and responsibility for the dam, the impoundment, and the lake bed at normal water level.

In 1979 the City of River Falls formed a Lake George Management District according to Chapter 33 of the Wisconsin Statutes. Chapter 33 of the Wisconsin Statutes was created in 1974 to provide for the formation of a new kind of lake management organization--the public inland lake protection and rehabilitation district --enabling governmental units such as the city, towns or counties to take a more active role in making decisions and preparing management plans for inland lakes and impoundments. Past evidence of detailed consideration of Lake George, and lake management in general, is referenced in the recent 205j Stormwater Management Plan (SEH, 1994), A Model Lake Plan for a Local Community (UW-Ext / DNR, 1994), the Planting & Managing the Urban Forest: Infrastructure & Commonwealth on the Kinnickinnic River (1994), the River Fall's Comprehensive Plan (City Council, 1987), the Lake

George Feasibility Study Results & Management Alternatives (WI DNR, 1985), the Lake George Sediment Sampling Study (GME Consult, 1990), the Main Street Project Vision 2000 Document (Main Street, 1994), and The Kinnickinnic Priority Watershed Application (St. Croix / Pierce Counties, 1994).

Studies conducted in 1995 to accurately determine depths of sediment and analysis of sediment samples for cadmium and chromium content were extremely valuable in verification and clarification of data from previous studies and provide the scientific basis for the following recommendations.

To determine if the River Falls community is satisfied with how Lake George is currently being managed, a public opinion survey was conducted in the summer of 1995. The survey was conducted by the Survey Research Center in the Rural Development Institute at UW-River Falls under the direction of Larry Swain. The survey was designed as a telephone survey representing a stratified random sample of citizens of the River Falls area. To obtain a 95% confidence level of the results, it was determined that 300 completed calls were needed. As calls were made, individuals were first asked if they had any knowledge of Lake George and if they wanted to participate in the survey. Thirty-one of those called refused to participate. This has nothing to do with the validity or bias of the survey.

The results of the survey overwhelmingly indicate the majority of citizens are not satisfied with how Lake George is currently being managed and they support making changes. They do not believe that Lake George is currently being managed in the most productive manner possible from all viewpoints in terms of collectively maximizing: 1) economic potential to the downtown business district and community as a whole; 2) integration with the City's Comprehensive Plan; 3) management and mitigation of stormwater impact; 4) fish and wildlife habitat; 5) public awareness of riverine ecology and management; 6) aesthetic appeal; and 7) recreation access.

A summary of recommendations for improvement are as follows:

1. 75% of the respondents indicated that they want completion of the trail system around the lake.
2. 74% of the respondents indicated that they want the natural environment improved by landscaping.
3. 55% of respondents indicated that they want the wildlife habitat of the area improved.
4. 47% of the respondents indicated that they wanted the fish habitat improved.
5. 24% indicated the need for a public dock.
6. 8% said to do nothing.

Under the open-ended question where respondents were to suggest in their own words what they wanted done, the following results were obtained.

1. 22% suggested cleaning up the area and making it more attractive.
2. 8% said to dredge the lake and clean up the sediment problem.
3. 6% said to make the lake more accessible.
4. 5% said to clean up the water and improve water quality.
5. 3% said to complete the trail.
6. 3% said to do nothing.

A sampling of other individual comments from respondents are as follows: (comments came from several hundred separate statements—a full listing of comments is included in the survey, Appendix A)

- City should treat it more as a city park; add more lighting and benches.
- Environmentally take the wildlife into consideration. Make the area prettier, but natural as well. No boats.
- Dams should be removed, turn it into wetlands and water abatement. Improve river habitat from just above the dams all the way to the edge of town. Downtown business to develop access off the riverside as well as off street. Build a restaurant over the lake.

- Adding a public boat dock would decrease the beauty and value; would decrease the natural habitat for birds.
- Some other communities use their natural resources. Play with the natural resources and make something work. I have never seen it as a real positive to the community because it is stuck behind the alley. Make it more appealing.
- Clean it up so people can walk around. More lighting so people can feel safe when they are walking at night.
- The lake and the river could be a benefit if people know how to use it. Publicize it more so the community knows it is there.
- See it enhanced more so people get use out of it. Keep it clean. Clean up the animal wastes that are there. Take the natural area and use it to be a magnet to the downtown area.
- Maintain and improve the fish habitat. More concern for the runoff from the new developments because of water temperature increasing.
- Make it an integral part of River Falls. Downtown needs to fix up the backs of stores and close up the alleys. It is hard to find access to the river, need better access. Start charging to support parks. Minnesota and Wisconsin using the parks.

Alternative II - Lake George Dam Removal Option. Eventual removal of the dam forming Lake George will restore the original Kinnickinnic river channel and recover the falls that give the city of River Falls its name. Because of recent renovations of the dam and continuing production of hydroelectric power this option is long range and needs to be included in the cities long range plan and economically reviewed annually. The 1989 renovation project extending the life of the dam 50 years, at a cost of $650,000.00 amortizes to $13,000.00 per year. The value of hydroelectric power is estimated at about $77,000.00 of annual avoided power costs. This value, however, has to be weighed against the cost to maintain and operate the facility and the thermal impact on the cold water fishery downstream. The twenty year bonds issued in 1989 to fund this project come to term in the year 2009. At that time a careful review of

economic costs and benefits will need review. According to Moe (1981), returning the lake to a stream habitat may have long-term economic benefits as well as aesthetic and recreational benefits. The lake temperatures are too cool to support a quality warm water fishery, and potential stormwater thermal affects could detrimentally affect a cold water fishery. The economic benefit of restoring the Kinnickinnic River Channel and the Falls will come from improved aesthetics and increased tourism and recreation. The University of Wisconsin Extension Recreation Resources Center has estimated increased economic benefit for similar communities with similar situations.

A recent survey of users of the Red Cedar State Trail in Menomonie indicated that approximately 40,0000 people visited the trail and spent approximately $1,971,200 in the area based on a per capita annual expenditure figure of $49.28 for visit-related expenses. An executive summary of this survey conducted by the Dunn County Extension Office is attached as appendix B.

According to Gary Anderson, Parks Director for the City of West Bend, removal of the Woolen Mills Dam in West Bend, Wisconsin has clearly resulted in a major expansion of the adjacent park, increased sport fishing, more play fields, extension of the city riverwalk, and consequent increased use by walkers and bikers. An economic benefit analysis will be prepared in the near future.

Removing dams is a realistic goal that is gaining momentum in river restoration. A recent article, "Dam Fights of the 1990's: Removals", River Voices, volume 5 no. 4, 1995 explained it this way.

> *Thousands of fights against dam construction, winning and losing, large and small, led the environmental movement for decades and a few large dam fights continued into the early 1900s. the results are grim. More than 68,000 large dams (two stories or higher) and some two million small dams choke the rivers of America. Approximately 600,000 miles of what had been free-flowing rivers now lie stagnant behind dams.*

Historically, questions about dams have been limited to where or whether to build them in the first place. Given what we now know, it is time to change the terms of the debate. It is time to ask whether or not existing dams should be allowed to remain.

A recent University of Wisconsin-Extension Report 96-1, "The Removal of Small Dams: An Institutional Analysis of the Wisconsin Experience" (UW-Madison, Dept. of Urban and Regional Planning), provides an interesting compilation of Wisconsin case studies.

To assist communities with dam removal, the Wisconsin DNR, under their Dam Safety Program has established a fund for dam removal. Removal of the dam forming Lake George may not be a viable option at this time, but has to be considered as an option in the future. The economics of dam maintenance, dam operation versus benefits has to be reviewed on an annual basis. At the point in time when potential aesthetic, recreational, wildlife and fishery benefits are large enough and important enough, the dam should be removed.

Alternative III - Complete Dredging of Lake George. Sediment depth determinations completed in 1995 determined the average depth of soil sediments to be 8 feet or 128,000 cubic yards of sediment in the 18-acre lake. Estimated costs for dredging; depending on type of system used, whether the water level can be dropped or not, and where will the dredged material be taken, etc. can vary from $3.00 to $5.00 per cubic yard for a total cost of $384,000.00 to $640,000.00. The range of dredging cost figures comes from a session presented at the 1996 Wisconsin Lakes Convention in Stevens Point, Wisconsin.

Additional concerns of dredging affects on water quality in terms of suspended sediment, release of potentially harmful chemicals from the sediment and temperature affects have to considered. Analyzing cadmium and chromium in sediment samples collected in 1995 indicated concentrations comparable to

other similar impoundments in Wisconsin and concentrations below the concern level with respect to dredging (see correspondence from Paul La Liberte, Water Resources Engineer, Wisconsin Department of Natural Resources, Appendix B. Personal communication with Buzz Sorge, Wisconsin Department of Natural Resources indicated that DNR is not supportive of dredging Lake George. They believe the costs and environmental hazards are too great to justify any small benefit potentials received. DNR is willing to help pay for other improvements to Lake George and the Kinnickinnic River but is not willing to assist with the costs of dredging.

Chapter 30 of the Wisconsin Statutes Section 30.20 states that "no person may remove any material from the bed of any navigable lake without first obtaining a permit".

Department of Natural Resources "Water Regulation Handbook" Chapter 120-Dredging states, "The removal of material from the bed of waterways is regulated to protect public rights against adverse impacts of "dredging". Potential impacts include turbidity, disturbance or destruction of aquatic organisms and habitat, release of contaminated materials, nutrients and other materials entrapped in the sediments and dissolved oxygen depletion". Additional impacts will be associated with dredging disposal site.

Alternative IV - Constructed Artificial Wetland/Stream Channeling Option

After extensive study, considerable discussion with DNR personnel and others, alternative IV is the recommended alternative as a management plan for Lake George. Construction of a berm along the river channel will channelize flow and separate the cold water of the Kinnickinnic River from the sediment laden area in the southeast two-thirds of the Lake. This berm could also function very effectively to reduce the effect of the downtown stormwater impact on the river. Dewatering of the sediments in the northeastern part of the lake to produce a semi-wetland area will function very effectively to mitigate the thermal and chemical properties of stormwater runoff from the city.

With the assistance of Darrin P. Beier, City of River Falls Engineer, the proposed berm (Figure 5) was designed to be 820 feet long, 12 feet wide at the top with an 8 foot wide asphalt path on top and a height of 6 feet above the water level. The berm would be constructed with medium rock on the inside, heavy rock on the surface against the river channel and crushed rock on the surface. Geotextile fabric would be placed under the crushed rock. To obtain a berm height of 6 feet above the water level and allowing for 3 feet of water depth and 3 feet of settling into the sediment, a total fill depth of 12 feet will be required. Including additional costs for construction of an access road for hauling, silt fencing, plantings, restoration, and engineering, the estimated cost of the total project is about $650,000. See Engineer's Estimate Sheet for more details.

The berm would enable completion of the White-Kinnickinnic pathway along both sides of the River with a pedestrian bridge crossing on the existing railroad bridge supports. The pathway would provide access to a semi-wetland area and park area depending on water elevation and how much dewatering occurs. The selection of Alternative IV as a management plan provides the greatest total benefit, including improved fish habitat, mitigation of stormwater runoff in established wetlands, and enhanced environmental educational opportunities with access to wetlands, river channel, lake etc. via an extensive pathway system.

The economic benefits of Alternative IV may not be as precise in exact dollars but include both short term and long term aesthetic, recreational and environmental benefits. The wetlands area behind the berm will effectively mitigate the thermal and chemical properties of the storm water runoff from the city. The berm will allow completion of the trail system. A more natural approach will improve wildlife and other aesthetic values and channeling of the Kinnickinnic River will increase the amount of class 1 trout stream in the city of River Falls.

In summary, it is important to note that the recommendations offered are made recognizing that the Kinnickinnic River is an outstanding State of Wisconsin water resource, a class 1 trout stream, and any

management plan has to take that into consideration. The City of River Falls is extremely fortunate to have such a resource and can expect significant economic benefits if appropriate management decisions are made. River Falls is a very desirable community to live in and will continue to grow at a rapid rate. Mitigation of stormwater runoff from increased imperious surfaces will continue to be a major water problem.

The bottom line for any of these recommendations is what are the citizens of River Falls willing to pay for. The attractiveness of Alternative IV is that the Wisconsin Department of Natural Resources will provide funding for wetland restoration for the purpose of storm water runoff, thermal mitigation and related costs of rip-rapping, bank stabilization and vegetation establishment.

Revamping Lake George to protect the cold water fishery of the Kinnickinnic River, while at the same time providing increased recreation, improved aesthetic appeal, public awareness and education of riverine ecology and management and integration with the City's comprehensive plan, will provide long-term economic benefit to the River Falls community.

COST CONSIDERATIONS

All recommendations presented involve various costs including landscaping, stream bank stabilization, berm construction, dredging, pathway construction, pedestrian bridge, land acquisition, loss of electrical power generated and ultimately cost of dam removal. Specific costs depend on what the City of River Falls and the Lake George Management District want to do and what will be acceptable to the Wisconsin Department of Natural Resources. Once a specific plan is approved, engineering services need to be obtained to develop specific cost estimates.

Funds to cover the cost of improvements recommended could come from a variety of sources including the federal government, the state of Wisconsin, counties or private organizations and individuals. Two high potential funding sources for the project are "The Lake Management Protection Grant Program" NR191 Wisconsin Administrative Code and the Wisconsin Non-point Pollution Priority Watershed Program. All sources of funding and support for this project need to be pursued and obtained to insure success of this project and improvement of Lake George and the Kinnickinnic River. As part of the State of Wisconsin "Dam Safety Program", cost share funds are available for Dam removal. Funds from the watershed program will specifically be available to develop wetlands for the purpose of stormwater mitigation.

LAKE GEORGE OPINION SURVEY

TELEPHONE SURVEY OF RIVER FALLS AREA RESIDENTS
JULY 1995

conducted by
DR. LARRY B. SWAIN
UW-RIVER FALLS
RIVER FALLS, WISCONSIN

LAKE GEORGE TELEPHONE SURVEY

In July of 1995 a telephone survey of 300 River Falls residents was conducted to ask their opinions of Lake George near downtown River Falls. Calls were made to local residents selected at random from the River Falls telephone directory. Individuals who had never been to Lake George or who had no knowledge of the lake were not surveyed.

The survey questionnaire was developed by Roger A. Swanson incorporating questions to determine River Falls community residents' perception of the Lake George Kinnickinnic River area; to determine how they viewed the economic value of this water resource and what they would like to see done to improve its attractiveness, recreational use, and economic value to the River Falls community.

The survey was conducted by the Survey Center located in the Agricultural Resources Center at UW-River Falls. The Center is located in the Rural Development Institute on the UW-River Falls campus. The center is directed by Dr. Larry B. Swain and conducts a wide variety of surveys utilizing trained callers who conduct the surveys. Calls are made between 4:30 PM and 8:30 PM, the time determined to be most effective and representative of the population.

It was determined that a sample size of 300 completed surveys would give a confidence level of 95% in the data. A random dispersed sample was selected from household numbers in the River Falls area. Only residential numbers were called and whoever answered the telephone (adult or youth over 14) was asked to answer the survey questions.

A short series of demographic questions were asked at the end of the survey to determine the structure of people interviewed. The demographics of those surveyed was then compared to demographics of the entire area to determine if the sample was representative of the population.

After the surveys were completed they were entered into a data base program for analysis. Each of the questions was summarized and the results are included in this report.

EXECUTIVE SUMMARY OF THE RESPONSES

Three major questions were asked of respondents. The first question consisted of three parts and was designed to get perceptions of participants about Lake George. One part was to determine what they thought about the aesthetic value of Lake George and the Kinnickinnic River. The results indicated that 60% of the respondents felt the aesthetics of Lake George and the Kinnickinnic River is somewhat or very appealing while only 22% thought they were unappealing.

The second part of the first question referred to their perception of the downtown economic value. Forty-five percent of those who participated in the survey indicated that the lake and river had some or large economic benefit to downtown. Twenty-four percent thought the lake and river had no value economically and 2%

thought it had a negative affect.

The third part of the first question asked if they currently used the river or lake for recreational purposes. Sixty-eight percent use the White Kinnickinnic Pathway, 63% use the area for wildlife observation, 34% fish either the river or the lake, 14% do canoeing and 7% do some tubing on the lake or river.

The second major question asked what participants thought should be done to improve the overall value of Lake George to the River Falls community. Respondents were asked to rank their first three choices in order of importance. A list of suggested choices was given to participants and they were also able to add anything they preferred. The following suggestions were ranked either one, two or three by the participants. The percentage indicates how many of the 300 people surveyed ranked that choice in their top three choices. First with 75% of total is to complete the trail system around the lake. Second with 74% mention is to improve the natural environment by landscaping. Third with 55% is to improve the wildlife habitat. Fourth is to improve fish habitat with 47% mention. Twenty-one percent mentioned adding a public dock for boating access. Finally, 8% said to do nothing to the area.

The third major question asked was open-ended and asked respondents to say in their own words what they would like to see done with the Lake George Kinnickinnic River area. The results indicated that 22% suggested cleaning up the area and making it more attractive. Eight percent said to dredge the lake and clean up the sediment problem. Making the lake more accessible was suggested by 6% of those surveyed. Cleaning up the water and improving water quality was mentioned by 5% of those surveyed. Another 3% said to complete the trail, and yet another 3% said to do nothing. Two percent suggested that the downtown businesses turn their business establishments around to face the lake and 2% also suggested to make the lake deeper. Numerous other comments were made individually and are listed in the results in addendum B.

The results of the survey indicate that residents are aware of and interested in both Lake George and the Kinnickinnic River. Citizens use the lake for and river for many purposes and are concerned about its future and its value to the community.

Eighty percent of those surveyed were residents of the City of River Falls. Others came primarily from the Towns surrounding the City. Fifty six percent have lived here over 10 years, 77% are residential property owners, 85% live further than a block from the river and 71% were between 26 and 55 years of age.

ADDENDUM A

LAKE GEORGE SURVEY FORM

Lake George Project

Opinion Survey Via Telephone

The City of River Falls working in cooperation with the University of Wisconsin-River Falls and the Wisconsin Department of Natural Resources is studying Lake George and looking at alternatives to improve its aesthetics, recreational use, and downtown economic benefit. Your input as a community member would be very valuable in guiding the long range management plan.

I. What are your current perceptions about Lake George with respect to the following:

A. Aesthetics of Lake George and the Kinnickinnic River
   1. very unappealing
   2. not very appealing
   3. neutral
   4. somewhat appealing
   5. very appealing

B. Benefit to downtown economic vitality
   1. negative benefit
   2. no benefit
   3. very little benefit
   4. some benefit
   5. very large benefit

C. The significance of the recreational value of Lake George and the Kinnickinnic River. Do you currently use any of the following for personal recreation (check all that apply).
   _____ 1. The White Kinnickinnic Pathway
   _____ 2. Fishing Lake and/or River
   _____ 3. Wildlife Observation
   _____ 4. Canoeing
   _____ 5. Tubing
   6. Other ? _____

II. What do you think should be done to improve the overall value of Lake George to the River Falls Community. (Select 3, numbering them 1 through 3 with 1 being the most important.)

_____ A. Do nothing
_____ B. Complete the trail system around the lake
_____ C. Add a public dock for boating access
_____ D. Improve fish habitat (trout or other)
_____ E. Improve other wildlife habitat, i.e. ducks, swans
_____ F. Improve the natural environment of the area by landscaping with more native species and adding lighting and benches.
G. Other _____
_____

III. Ideally in your own words what would you like to see done with the Lake George Kinnickinnic River area.

IV. Personal demographics

A. Area you a resident of the City of River Falls?

YES _____ NO _____ / (city/town/county) _____

B. How long have you lived in River Falls?

_____ Less than six months
_____ 6 months - one year
_____ 2 - 5 years
_____ 6 - 10 years
_____ 11 - 29 years
_____ 30+ years

C. What is your age?

_____ 16 - 25
_____ 26 - 35
_____ 36 - 45
_____ 46 - 55
_____ 56 - 65
_____ 65+

D. Are you a . . .

___ Commercial property owner?
___ Residential property owner?
___ Renter?
___ Concerned Citizen?
___ Business person?

E. Does your property . . .

_____ abut the Kinnickinnic River and/or Lake George?
_____ lie within one block of the Kinnickinnic River and/or Lake George?
_____ farther than 1 block from Kinnickinnic River and/or Lake George

ADDENDUM B

DATA RESULTS OF LAKE GEORGE SURVEY

Summary Of Lake George Survey
300 participants
(31 Never Been To Lake George)

Q1 A. Aesthetics of Lake George and the Kinnickinnic River

5%	very unappealing
17%	not very appealing
18%	neutral
46%	somewhat appealing
14%	very appealing

B. Benefit to downtown economic vitality

2%	negative benefit
24%	no benefit
29%	very little benefit
35%	some benefit
10%	very large benefit

C. Do you currently use any of the following for personal recreation?

68%	The White Kinnickinnic Pathway
63%	Wildlife Observation
34%	Fishing Lake and/or River
14%	Canoeing
7%	Tubing

Other. . .

Raw Number	
5	picnics
4	swimming
3	biking
2	hiking
	look at it as we are driving by
	feed geese
	path along the river
	tadpoles in Kinni
	relax
	play on the beach
	enjoying

Q2. What do you think should be done to improve the overall value of Lake George to the River Falls Community. (numbering 1 through 3 with 1 being the most important.)

Complete the trail system around the lake
1 = 42% 2 = 21% 3 = 12% Total = 75%

Improve the natural environment of the area by landscaping
1 = 31% 2 = 18% 3 = 25% Total = 74%

Improve other wildlife habitat (ducks and swans)
1= 3% 2 = 29% 3 = 23% Total = 55%

Improve fish habitat (trout or other)
1 = 15% 2 = 17% 3 = 15% Total = 47%

Add a public dock for boating access
1 = 3% 2 = 10% 3 = 8% Total = 21%

Do nothing
1 = 5% 2 = 1% 3 = 2% Total = 8%

other. . .

Raw Number
3 dredge the lake
get rid of dams, wetland - storm water abaitment
get rid of More 4
dumpsters removed
more zoning
reorient downtown to make use of it
draining
get rid of trailer park by dam
improve water quality
business with store fronts to the frontside of lake
water is stagnant - need more flow

Q3. Ideally in your own words what would you like to see done with the Lake George Kinnickinnic River area. . .

Raw Number
65 clean up the area and make it attractive
24 dredge the lake, clean up sediment
18 make it more accessible
15 clean up the water, improve water quality
9 fine the way it is
9 complete the trail around the lake
7 make it deeper
6 turn businesses around to face the lake

Developed more around the area of the lake (clean water, natural environment).

I don't think I would add or take anything away. It would become more natural if we left it alone.

Pierce/St. Croix county residents need to be the only ones to use the lake.

Grossly overused. No hiking trails. Fish habitat overused. Raise prices for out of state fishing licenses.

Make useful to people by making more parking to enjoy the lake.

No boat access to river and lake.

Trails more developed and dredge a beach.

Fish habitat - more variety of fish.

City should treat it more as a city park, add more lighting and benches.

See it be as natural as possible, but remain Lake George.

Environmentally take the wildlife into consideration. Make the area prettier, but natural as well. No boats.

Vision 2000 meeting. She loved all the ideas given there. Doesn't like Heftdal - lady for the meeting. It is a beautiful area.

Main concern without bypass, more development in the area increases sedimentation in the river lake. Decrease in trout fishing.

More strictly zoned and managed. Study when there is a new building. Do not pollute the area.

Do not put sand on the bottom, it is bad for the fish.

Dams removed, turn it into wetlands and water abaitment. Improve river habitat from just above the dams all the way to the edge of town. Downtown business to develop access off the riverside as well as off street. Restaurant over the lake.

Adding a public boat dock would decrease the beauty value and decrease the natural habitat for birds. Tear down More 4.

Park board should do something. Canoeing has been hashed and rehashed. They could've taken out all of the refuse out (tires) when they drained it last time. Residence there like it as is. It is like a dead white horse in a bathtub.

Who's fund will the maintenance come from? Talk to architects to fix up the back side of Main Street.

Some other communities use their natural resources. Play with the natural resources and make something work. I've never seen it as a real positive to the community because it is stuck behind the alley. Make it more appealing.

Turn it back more to nature rather than let them build around it.
Wish it were more visible, clear out the brush. Like to see land around lake managed better. Mall could've done something more to take advantage of the area. Trees along back side of More 4 can go, can't see the back of mall.
Like to see it made better use of. Mistake to build More 4 mall.
Area not taken advantage of by businesses, build against it. More 4 mall is a waste.
Keep it pretty.
Need a downtown park setting, dock fishing, make it a nice well kept "secret garden".
Advertise it more so people know where Lake George is.
Improved. Walkway not used because it is not safe!!
Bigger waterfall by the dam.
New bridge is nice. People will never refuse or reject adding things to it. Set up tubes or canoes to rent so we can enjoy the lake and river more.
Trailer areas keep up. Finish pathway. Make it add to the beauty of the city.
Get the spill ways out of there.
Walkway used a lot so extend it. Start it at highway 35. Make the trail be on both sides.
It is not a benefit because the downtown does not utilize it. I would like to be able to see it more.
There is a lot potential, but not used because it is hidden. Path needs to be maintained. Need to clean up litter. I am concerned about pollution in water and along the side.
Put in boat dock. Don't change the embankment. Leave it natural.
Make it a shallow pond. In general enhance the natural beauty.
I'd like to see a boat landing put in.
Do not raise taxes to change it. Restrict the use of it. Leave it natural.
Move stuff that is there. Division Street bridge a lot of junk.
People can sit there or use as a park area. It is an attractive point and should be used. Relocated the businesses.
Make it more environmentally developed around the lake.
Upper Kinnickinnic area is beautiful.
Do anything that doesn't cost money.
The river attracts not very nice people (rough kids hang out on path) - need more lighting and patrol to discourage that type of behavior and people.
Horseback trails around the lake might make more tourism.
Parts of the pathway should be naturalized.
Leave the flood plain alone.
Support the fish habitat.
Lake George - different varieties of fish.
Have more wildlife in the area. Restrooms/satellites around the lake.
Add more trees.
Have all of the banks cleaned up and maintained.
I would like to see more of a DNR-type presence enforcing fishing policies and stopping littering by children/adults.

Have it where people can enjoy it more and where fishermen can go to fish in a nice quiet area.
Add more landscaping.
Demolish More 4 mall. Kinni valley preserved for wildlife beauty.
Turn front door to the lake instead of back doors. Stop and admire it more.
Put a path behind the More 4 to the water.
Take the junk out.
Fix it up.
Clean it up so people can walk around. More lighting so people can feel safe when they are walking at night.
Complete it and make it more accessible from the downtown area.
Boat docks might be nice to have. Improve the fish habitat.
The lake and the river could be a benefit if people knew how to use it. Publicize it more so the community knows it is there.
It is natural the way it is so it should be left the way it is.
More access to it as far as picnic tables and bench areas. There is no where to enjoy it on the More 4 side, there is just a parking lot there.
See it enhanced more so people get use out of it. Keep it clean. Clean up the animal wastes that are there. Take the natural area and use it to be a magnet to the downtown area.
It looks pretty good now. Do anything to preserve the wildlife and natural beauty while allowing residents to enjoy it.
I like the trail the best.
Make it so people are not afraid to go down there (especially at night). Put lights up during Christmas time. I think it is really beautiful at night but I won't go there because I am afraid. Many people are afraid at night.
Make it more suitable for the wildlife.
I would like to see the east side of More 4 developed into a more appealing area. Dumpsters very unappealing. Change the architecture there. It blew me away that no restaurants took advantage of it.
Would like to see it more developed in a natural state so people can use it. The pathway is great, but the rest is more unusable for the people.
Maintain and improve the fish habitat. More concern for the runoff from the new developments because of water temperature increasing.
Concerned with environmental mess and clean up from abandoned cars and parts in river, really need to address this issue.
Longer trails.
Quit building commercial buildings along the river. Everyone should be able to walk along the area. We have something here in River Falls that people travel to Europe to see and enjoy.
Park could be improved. River is fine.
Make it an intregal part of River Falls. Downtown needs to fix up the backs of stores and close up the alleys. It is hard to find access to the river, need better access. Start charging to support parks. Minn. and Wisc. Using the parks.

I think we need to utilize the natural resources more. It is like it is hidden. Make the most of the area's beauty.
Railroad tracks should be removed and clean out the brush areas.
Keep it healthy.
Let it be viewed by everyone. Pathway should be continued.
Preserve it as it is. Develop habit of leaving things alone.
Updated and improved to be more appealing.
More natural looking. Put in duck feeders or bird houses to help out the wildlife.
Different sites to look at it especially on the left side. Let businesses have a view, take alley out so they can view it.
More lighting and benches. It would be nicer if you're not in a group. It is bad to go out there alone, well lit places are a priority for me when I am out.
Just add longer trails and stuff.
Leave it as a separate park, not manmade looking.
Native species would be good.
Encourage people using lake to shop and people shopping to use the lake. Bridge idea a good one, too bad it wasn't able to be done across the piers. Landmark it not taken advantage of. Potential is a plus, other cities would love to have this.
Would like it to be more focal than backyard. Take advantage of the beauty and potential of it.
I would like to see it kept as natural as possible. It might be expensive, but just maintain it. White pathway maintenance is important. If that goes down then the whole area starts to be unappealing.
I would like to see it made more parklike inviting people to get close to it.
I swim there once and awhile and it seems slimy on the bottom.
Make literature on the river and pathways.
Lake George could be attractive if businesses would not neglect the resource.
It is a treasure to have the lake and river here.
I would like to see more seating.
Keep people from abusing it.
I would like to see restaurants on the river.
There is huge potential to use here. There should be a clean waterway and lake for the community to use.
Nice situation we have in this town. Make it more visible so people can enjoy it.
More 4 is an eye-sore, put up a cedar fence between More 4 and riverbanks. Need to make it more appealing, more riverlike.
Kinnickinnic is fine. Lake George, I would hate to do anything to take away from current wildlife, ducks etc. Do not drain the lake.
The only thing I am not sure about is how safe it is to walk in the pathway. We need to add more lighting and more protection.
Get rid of buildings and allow the natural view to shine.

Parking lots should be set back 10-12 feet so picnic tables can be set up there. Neighbors septic system flows right into the water and no wildlife come there anymore and it kills all of the fish. Activities like this should be stopped!!!
Keep natural looking.
Use it to its full potential.
Keep it protected and make people feel that way.
More patrols to watch kids activities and to make sure animals (pets) are on leashes and their wastes are picked up.
Have it viewed more by businesses. Trim it so it looks nicer, keep it up more.
Use the potential that is there!
Add another path for bikes and roller blades that is more scenic.
If you add a boat dock do not allow boats with motors, pollution and noise is a problem.
Get rid of brush. Make and develop it nicer.
Maintain it and add more wildlife. The area has potential, but it is not being used to its fullest.
Keep it as wild as possible.
Make it more safe. Patrol it. Have better lighting without taking away from the beauty.
Have the Kinnickinnic River left wild for people to enjoy fishing.
Study and protect the fish habitat.
Have a park all the way around including Main Street. Tear up the More 4 parking lot and make it a park.
More conducive for fish species to live in the water.
The lake should stay. Do not take out dam. More fishing opportunities to fish on lake. Bigger fishing dock or add more fishing docks for kids.
It is an eyesore with the muck. It is unable to sustain a healthy level of living for fish species.
Businesses should take it upon themselves to improve the area.
Increase the fish varieties.
More lighting on the trails around the lake.
More direction signs to access areas to encourage use.
It is important to have "foot patrol" out around the lake.
Love having the geese and animals around. Need surface area of lake George dredged out, but do not harm the wildlife.
I would like to see some more trees. Block out More 4.
Have signs to show what wildlife inhabits the areas or what things (plants/wildlife) are in the area to look for while walking.
More flow of water to rejuvenate lake and river. Water level has gone down on river and has caused reduced fishing, and has changed the scenic value.
There's garbage in the water where the ducks swim.
Improve the fish habitat.
It is a great lake but has been going downhill. Do the general upkeep on it like it had 10 years ago.
Control buildings around the lake. Increase the pathway.
More duck houses. Keep an eye on people who fish, they take more than their limit. Make more accessible to kids and handicap. Knows people who kill beavers, have a better DNR watch.

More patrols so we can feel safe.
Create a nice park. Stop the runoffs.
Have more events sponsored on or around the lake or river (ex: concerts, plays).
Protect the fish.
Incorporate it into the downtown area. Remodel around the lake.
Make the lake important.
Pathway is not safe anymore.
It is a wonderful resource, I would hate to see it developed so far as to have boat docks. I would like to see it (visually) more, and have better access. Businesses should use it to its potential.
Take out old bridge.
I would like to see an effort to keep the lake and river healthy.
Have more information about them available.
Patrol it more and get it under control.
Disappointed with More 4. Add a restaurant overlooking the lake. It is a nice area, but you cannot see it.

Personal Demographics

Q4A. Are you a resident of the City of River Falls?

80% yes 20% no

If no than where. . .

Raw Number
19 River Falls Township
15 Troy Township
12 Kinnic Township
3 Oak Grove Township
3 Clifton Township
2 Roberts
2 Martel Township
Washburn Shell Lake

Q4B. How long have you lived in River Falls?

1% Less than six months
3% 6 months - one year
21% 2 - 5 years
19% 6 - 10 years
38% 11 - 29 years
18% 30+ years

Q4C. What is your age?

15% 16 - 25
26% 26 - 35
27% 36 - 45
18% 46 - 55
8% 56 - 65
6% 65+

Q4D. Are you a . . .

77% Residential property owner
23% Renter
3% Commercial property owner
3% Concerned Citizen
2% Business person

Q4E. Does your property . . .

5% next to lake and/or river
10% within one block
85% further than one block

Original Comments Without Alterations

Dredge it deeper.
Developed more around the area of the lake (clean water, natural environment).
I don't think I would add or take anything away. It would become more natural if we left it alone.
I like it a lot right now, but I think the lake is dirty.
Pierce/St. Croix county residents need to be the only ones to use the lake.
Grossly overused. No hiking trails. Fish habitat overused. Raise prices for out-of-state fishing licenses.
Not very accessible. Make useful to people by making more parking to enjoy the lake.
No boat access to river and lake.
Trails more developed and dredge a beach.
Would like to see river bottom cleaned up before the water and area can be cleaned up. A lot of things have been benefiting man that man has taken advantage of. The snow hasn't replenished the supply of water to the river.
Fish habitat - more variety of fish.
I would like to see the lake cleaned up a lot.
City should treat it more as city park, add more lighting and benches.
See it be as natural as possible, but remain Lake George.
Environmentally take the wildlife into consideration. Make the area prettier, but natural as well. No boats.
Vision 2000 meeting. She loved all the ideas given there. Doesn't like Heftdal - lady for the meeting. It is a beautiful area.
Main concern without bypass, more development in the area increases sedimentation in the river/lake. Decrease in trout fishing.
More strictly zoned and managed. Study when there is a new building. Do not pollute the area.
Do not put sand on the bottom, it is bad for the fish.
Make it more appealing for recreational use whether it is for swimming, canoeing or etc. Add to the beauty of the area.
Dams removed, turn it into wetlands and water abaitment. Improve river habitat from just above the dams all the way to the edge of town. Downtown business to develop access off the riverside as well as off street. Restaurant over the lake.
Just have to be more appealing by suggested ways in the earlier question.
Adding a public boat dock would decrease the beauty value and decrease the natural habitat for birds. Tear down More 4.
It seems swampy, they should clear it out or clean it up.
Park board should do something. Conoeing has been hashed and rehashed. They could've taken out all of the refuse out (tires) when they drained it last time. Residence there like it as is. It is like a dead white horse in a bathtub.
Who's fund will the maintenance come from? Talk to architect to fix up the back side of Main Street.

Some other communities use their natural resources. Play with the natural resources and make something work. I've never seen it as a real positive to the community because it is stuck behind the alley. Make it more appealing.

Turn it back more to nature rather than let them build around it.

Wish it were more visible, clear out the brush. Like to see land around lake managed better. Mall could've done something more to take advantage of the area. Trees along back side of More 4 can go, can't see the back of mall.

Like to see it made better use of. More accessible to use or view.

Mistake to build More 4 mall. Area not taken advantage of by businesses, build against it. More 4 mall is a waste.

Keep it pretty.

Make it deeper it is too shallow. Get rid of the sediment.

Need a downtown park setting, dock fishing, make it a nice well kept "secret garden".

I would like to see it dredged and make it deeper. Clean up the water and make it clearer. Make it better for the fish. Give it a good cleaning, a lot of stuff on the bottom.

More publicity of area, fix it up and put in picnic tables around it to bring people in.

Advertise it more so people know where Lake George is.

Needs to be cleaned out, could be prettier if you get the sediment out of there.

Dredge it and clean it up a little bit.

Improved. Walkway not used because it is not safe!!

Bigger waterfall by the dam.

More attractive, wonderful park, value it, spend money on preserving it and not allowing tech. to spoil it. Make us feel safe to walk on it. Pick up trash. Areas accessible with benches and have it be a beautiful area without hurting the fish.

New bridge is nice. People will never refuse or reject adding things to it. Set up tubes or canoes to rent so we can enjoy the lake and river more.

Clean it up a little more in the water and along the shore line.

Trailer areas keep up. Enhance and clean up the area. Finish pathway. Make it add to the beauty of the city.

Get the spill ways out of there. Make it deeper.

Walkway used a lot so extend it. Start it at Highway 35. Make the trail be on both sides.

I would like it more beautified and useable.

The Main Street association should develop backside as much as front side. Should be putting in more time and effort. Backside detracts instead of attracts. Commercial use doesn't blend.

It could be beautiful, but we don't know how to go about it.

It is not a benefit because the downtown does not utilize it.

Better access. I would like to be able to see it more.

Plant more trees especially by More 4. Clean it up a little bit.

Some areas are getting scummy, clean it up and then let it be natural.

Would like to see it improved so people can enjoy the beauty.

There is a lot potential, but not used because it is hidden. Path needs to be maintained. Need to clean up litter. I am concerned about pollution in water and along the side.
Just improve the looks of it and make the paths so they are more accessible.
Put in boat dock. Clean it up, but don't change the embankment. Leave it natural.
Clean up the river.
Develop the back side of Main Street so that the area isn't just an alley. Main Street association can be developed to make better environment for the business. Add more paths and benches.
It is just fine the way it is.
Make it look nice and not run down.
I would like to see the lake dredged and make it a shallow pond. In general enhance the natural beauty.
Want to see it improved, but not built up. Keep it in a natural state.
I'd like to see a boat landing put in.
Do not raise taxes to change it. Restrict the use of it. Leave it natural.
Just add more trails. Trails made down Lake Harriet and the lower dam. Basically just extend the trail system.
Clean it up. Move stuff that is there. Division Street bridge a lot of junk. People can sit there or use as a park area. It is an attractive point and should be used. Relocated the businesses.
Make it more environmentally developed around the lake.
Dredge the lake and clean up the water which should have been done when it was drained out. Improve the lighting on Kinnickinnic pathway for everyone's safety.
Dredge the lake by the Dairy Queen and More 4. Upper Kinnickinnic area is beautiful, but need more access.
Do anything that doesn't cost money.
Clean up the river and lake. The river attracts not very nice people (rough kids hang out on path) - need more lighting and patrol to discourage that type of behavior and people.
Horseback trails around the lake might make more tourism.
Parts of the pathway should be naturalized.
Leave the flood plain alone.
Dredge the lake to support the fish habitat.
Lake George - different varieties of fish.
More access to Lake George.
It is really accessible. Have more wildlife in the area.
Restrooms/satellites around the lake.
Make it more appealing by cleaning up the river and the lake.
Clean up the area and clean up the water so it doesn't look so "mucky".
Stay cleaned up.
Clean it up a little bit and add more trees.
Have all of the banks cleaned up and maintained.
I would like to see more of a DNR-type presence enforcing fishing policies and stopping littering by children/adults.
Make it more accessible to the public, so people can enjoy it more and where fishermen can go to fish in a nice quiet area.
Clean it up and add more landscaping. More and better access.

Do nothing, I like it as it is.
Keep up with the pathway. Keep the area natural.
Demolish More 4 mall. Kinni valley preserved for wildlife beauty.
Turn front door to the lake instead of back doors. Stop and admire it more.
More accessibility, put a path behind the More 4 to the water.
Dredge it and take the junk out.
Fix it up and make it more accessible.
Clean it up so people can walk around. More lighting so people can feel safe when they are walking at night.
Easier or better looking for the public.
Make the water clean, it looks so dirty.
Clean it up and make it more attractive.
Clean up the messy areas around the shoreline.
Complete it and make it more accessible from the downtown area.
Boat docks might be nice to have. Improve the fish habitat.
The lake and the river could be a benefit if people knew how to use it. Publicize it more so the community knows it is there.
It is natural the way it is so it should be left the way it is.
More access to it as far as picnic tables and bench areas. There is no where to enjoy it on the More 4 side, there is just a parking lot there.
See it enhanced more so people get use out of it. Keep it clean.
Clean up the animal wastes that are there. Take the natural area and use it to be a magnet to the downtown area.
It looks pretty good now. Do anything to preserve the wildlife and natural beauty while allowing residents to enjoy it.
I like the trail the best.
Make it so people are not afraid to go down there (especially at night). Put lights up during christmas time. I think it is really beautiful at night but I won't go there because I am afraid. Many people are afraid at night.
Make it more suitable for the wildlife.
Clean it up. The water and some areas are so dirty. Take pride in the area.
I would like to see Lake George cleaned up. The water quality is bad.
Clean it all up (lake side and water) and keep it clean.
Improve it as far as the water quality and the walking paths.
Make it look cleaner and improve the water quality.
Improve the beauty of the lake shores and keep it natural. Trim behind the Dairy Queen and More 4. Keep the wildlife in mind.
I would like to see the east side of More 4 developed into a more appealing area. Dumpsters very unappealing. Change the architecture there. It blew me away that no restaurants took advantage of it.
Would like to see it more developed in a natural state so people can use it. The pathway is great, but the rest is more unusable for the people.
Clean up the water.
Clean up the lake along the shoreline.
Clean up Lake George because it is not very nice to look at.

Maintain and improve the fish habitat. More concern for the runoff from the new developments because of water temperature increasing.

Concerned with environmental mess and clean up from abandoned cars and parts in river, really need to address this issue.

Make the lake and river area more appealing. Lake should have easier access. Make it an important issue to clean up the area.

Longer trails.

Quit building commercial buildings along the river. Everyone should be able to walk along the area. We have something here in River Falls that people travel to Europe to see and enjoy.

Lake could be dredged and made deeper. Park could be improved.

River is fine.

Make it an intregal part of River Falls. Downtown needs to fix up the backs of stores and close up the alleys. It is hard to find access to the river, need better access. Start charging to support parks. Minn. and Wisc. using the parks.

I think we need to utilize the natural resources more. It is like it is hidden. Make the most of the area's beauty.

Get it cleaned up, the river and the water. Improve the pathway around the lake with more things like trees, improve wildlife surrounding the area.

Railroad tracks should be removed and clean out the brush areas.

Keep it healthy.

Let it be viewed by everyone. Pathway should be continued.

Preserve it as it is. Develop habit of leaving things alone.

Updated and improved to be more appealing.

Dredge it and clean it up. More natural looking. Put in duck feeders or bird houses to help out the wildlife.

Make it more appealing to the people.

Clean it up and make it more attractive to the public.

Clean it up a little bit.

Have it look nicer and more accessible from different areas.

Improve water quality. Make More 4 pay to clean up their area out back. Put a dock in, but have only boats with no motors ex: rowboats, canoes.

More access. Different sites to look at it especially on the left side. Let businesses have a view, take alley out so they can view it.

Dredge it and make it a nicer lake.

More lighting and benches. It would be nicer if you're not in a group. It is bad to go out there alone, well lit places are a priority for me when I am out.

Clean it up a little bit.

Just add longer trails and stuff.

Clean it up and get the muck out.

Leave it as a separate park, not manmade looking. Complete trails, do not make it part of the downtown. Having to seek it out is part of its charm. Small shore fishing dock, no boat access and no gasoline motors on lake.

Native species would be good.

Make it more attractive, more aesthetically appealing but no boat docks. Boat docks only encourage motors and noise. Keep it a quiet and peaceful place.

Encourage people using lake to shop and people shopping to use the lake. Bridge idea a good one, too bad it wasn't able to be done across the piers. Landmark it not taken advantage of.

Potential is a plus, other cities would love to have this.

I would like to see the surrounding area cleaned up. (Lake side and shores). Clean up the garbage.

Would like it to be more focal than backyard. Take advantage of the beauty and potential of it.

I would like to see it kept as natural as possible. It might be expensive, but just maintain it. White pathway maintenance is important. If that goes down then the whole area starts to be unappealing.

I would like to see it made more parklike inviting people to get close to it.

Make it parkway all the way from the 2nd lower dam to the end of River Falls on both sides. Make it into a county or city park.

Lake should be dug out and cleaned up. This would amplify it.

Clean it up a little bit, the water and lakeshore. I swim there once and awhile and it seems slimy on the bottom.

Make it more accessible and make literature on the river and pathways.

Lake George could be attractive if businesses would not neglect the resource.

Keep it clean.

It is a treasure to have the lake and river here.

Make the lake tie in with the Main Street. Originally built with buildings facing away from the river.

I think it is fine the way it is.

I would like to see more seating.

Clean up the river. Keep people from abusing it.

I would like to see restaurants on the river.

There is huge potential to use here. There should be a clean waterway and lake for the community to use.

Nice situation we have in this town. Make it more visible so people can enjoy it.

Make more access to riverbanks. More 4 is an eye-sore, put up a cedar fence between More 4 and riverbanks. Need to make it more appealing, more riverlike.

Kinnickinnic is fine. Lake George, I would hate to do anything to take away from current wildlife, ducks etc. Do not drain the lake.

The only thing I am not sure about is how safe it is to walk in the pathway. We need to add more lighting and more protection.

Get rid of buildings and allow the natural view to shine.

Parking lots should be set back 10-12 feet so picnic tables can be set up there. Neighbors septic system flows right into the water and no wildlife come there anymore and it kills all of the fish. Activities like this should be stopped!!!

Leave Lake George alone! It is fine!

Keep it clean and natural looking.

Use it to its full potential.

Keep it protected and make people feel that way.
More patrols to watch kids activities and to make sure animals (pets) are on leashes and their wastes are picked up.
Have it viewed more by businesses. Trim it so it looks nicer, keep it up more.
Use it as a benefit. Open doors to it instead of the back doors. Use the potential that is there!
Add another path for bikes and roller blades that is more scenic.
If you add a boat dock do not allow boats with motors, pollution and noise is a problem.
Clean it up and get rid of brush. Make and develop it nicer.
Keep it clean and keep the pollution out.
Keep it clean and complete the trails.
Maintain it and add more wildlife. The area has potential, but it is not being used to its fullest.
Make it more accessible.
Have better groomed trails.
Better water quality. Approach some areas and make it more inviting. More natural look to it.
Keep it as wild as possible.
Make it more safe. Patrol it. Have better lighting without taking away from the beauty.
Have the Kinnickinnic river left wild for people to enjoy fishing.
Study and protect the fish habitat.
Have a park all the way around including Main Street. Tear up the More 4 parking lot and make it a park.
Dredge it all the way to the new bridge so it would be a nice clean lake.
Dredge the lake to make it deeper and more conducive for fish species to live in the water.
The lake should stay. Do not take out dam. More fishing opportunities to fish on lake. Bigger fishing dock or add more fishing docks for kids.
Clean up the lake - it is an eyesore with the muck. It is unable to sustain a healthy level of living for fish species.
Need to improve the "backs" of the buildings that face the river. Businesses should take it upon themselves to improve the area.
Increase the fish varieties.
More lighting on the trails around the lake.
Keep it clean and in a natural, usable state.
Clean up Lake George.
Clean up the lake area and create more access and direction signs to access areas to encourage use.
It is important to have "foot patrol" out around the lake.
Love having the geese and animals around. Need surface area of Lake George dredged out, but do not harm the wildlife. Important to complete trail system.
Dredge the lake to make it deeper for fish. Complete the trail system.
Clean up the garbage around the lake.
I would like to see some more trees. Block out More 4.
Dredge the lake or clean the water supply.
Have signs to show what wildlife inhabits the areas or what things (plants/wildlife) are in the area to look for while walking.

More flow of water to rejuvenate lake and river. Water level has gone down on river and has caused reduced fishing, and has changed the scenic value.
Clean all of the crap out of the lake. There's garbage in the water where the ducks swim.
Continual maintenance of fish habitat and creating environments that are conducive for other species of fish. Dredge the lake to make sure the river silt deposits are maintained around the bend by More 4.
I am too old to make changes.
Improve the fish habitat.
Clean it up and dredge it.
It is a great lake but has been going downhill. Do the general upkeep on it like it had 10 years ago.
Control buildings around the lake. Increase the pathway and make it more accessible.
I would like to see it kept up better (grass and trails). More duck houses. Keep an eye on people who fish, they take more than their limit. Make more accessible to kids and handicap. Knows people who kill beavers, have a better DNR watch.
Clean it up.
Dredge it.
More patrols so we can feel safe.
Create a nice park. Stop the runoffs.
Leave it alone.
Build up around there and remove the sludge on the bottom. Put up rip rap around the area.
Have more events sponsored on or around the lake or river (ex: concerts, plays).
Protect the fish.
Clean it up and make it look more attractive.
Incorporate it into the downtown area. Remodel around the lake. Make the lake important.
It is lovely the way it is.
Pathway is not safe anymore.
Leave it alone.
It is a wonderful resource, I would hate to see it developed so far as to have boat docks. I would like to see it (visually) more, and have better access. Businesses should use it to its potential.
Take out old bridge.
I would like to see an effort to keep the lake and river healthy.
Have more information about them available. Have better access.
Leave it as it is.
Dredge it out.
Patrol it more and get it under control.
Disappointed with More 4. Add a restaurant overlooking the lake.
Clean it up and dredge it.
Clean it up and make it more attractive.
Needs to be more accessible. It is a nice area, but you cannot see it.

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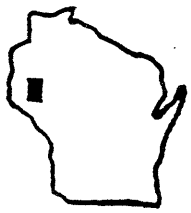

A Profile of Red Cedar State Trail Annual Pass Holders

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Introduction

In 1995, the Dunn County University of Wisconsin Cooperative Extension Office conducted a survey of annual pass holders on the Red Cedar State Trail. The survey was conducted in cooperation with the City of Menomonie Tourism Commission, the Greater Menomonie Area Chamber of Commerce, and the Wisconsin Department of Natural Resources.

The purposes of the study were 1) to develop a profile of the annual pass users of the trail, 2) to verify the targeted marketing/promotional efforts of the City of Menomonie Tourism Commission, and 3) to estimate the economic impact of the trail to the Menomonie Community.

The information gathered will be useful to businesses in the Menomonie area that serve trail users and to potential businesses that may want to address identified unmet user needs. Promotional and advertising campaigns can use the profile information to better market the trail.

History and Description of the Red Cedar State Trail

The Red Cedar State Trail stretches along 14.5 miles of historic railroad bed that was once the key to Menomonie's timber industry (see Figure 1). The Red Cedar Junction Line, which first carried lumber out of the Menomonie area in the 1800's servicing the Knapp and Stout Company, (the largest lumber producing company in the world at that time) was abandoned in 1973. At the trail's head in Menomonie, stands the original rail freight depot that now serves as the trail's interpretive center. The fine crushed limestone trail passes over eleven authentic railroad bridges through the communities of Irvington, Downsville and the Dunnville Wildlife Area.

Daily and annual pass fees are collected to cover trail maintenance costs. Bikers and skiers are required to purchase either a $3 daily pass or a $10 annual pass. Walkers and joggers are not required to purchase passes to use the trail. Children under age 16 can use the trail for free.

Methodology

The survey sample consists of annual pass holders from 1994. Annual pass holders were used because address information is recorded when a pass is purchased. Over 1200 names were coded and a one-page survey (see Appendix A) was mailed out in July, 1995. A self-addressed stamped envelope, and a trail brochure were included in the survey mailing. A reminder post-card was sent two weeks later to ensure a good response rate.

By the August 15, 1995, cut-off date, 570 survey responses were received; for a response rate of 47 percent. With this response rate, it was felt that an adequate survey sample was received. Seventeen invalid surveys were discarded, leaving a total of 553 valid surveys for the analysis. Approximately one dozen surveys arrived after the cut-off date, but were not considered in the total number of survey responses.

Summary

Applying the results of this survey to the approximately 40,000 people who visited the Red Cedar State Trail in 1994, it is estimated that annual pass trail users spent approximately **$1,971,200** in the area, based on a per capita annual expenditure figure of **$49.28** for visit-related expenses.

The survey results show:

* Eighty-six percent of the annual pass trail users are from Wisconsin.

* Minnesota accounted for 94 percent of out-of-state annual pass trail visitors.

* Menomonie was the largest single market area that respondents came from (174), with Eau Claire second largest (77).

* Dunn County annual pass trail users accounted for 38 percent of total visitors.

* Bicycling (87 percent) was the most frequently reported activity on the Red Cedar State Trail. Walking/jogging (29 percent) and skiing (29 percent) tied for second.

* For those respondents staying overnight, campgrounds (33 percent) and motels (31 percent) were used most.

* Fifty-six percent of the respondents indicated that they also dined out while visiting the trail.

* The annual average per capita spent in restaurants was $34.89 or a total of $10,851 for the 311 respondents.

* Annual pass trail visitors typically rated trail impressions from good to excellent.

* Ninety-nine percent of the respondents said they would visit the trail again.

* The most common source of information about the trail was from friends, family or acquaintances.

* The most frequently mentioned additions the respondents would like to see provided near the trail were more eating places (148) and camping facilities (128).

* The most frequently mentioned additions the respondents would like to see provided on the trail were more rest rooms (238) and interpretive/educational displays (125).

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River Voices

Dam Fights of the 1990s: Removals

Removing dams is a realistic goal that is gaining momentum in river restoration

by Rita Haberman

River conservation, indeed much of the history of the American environmental movement, has been largely defined by dams. Large dams, and epic dam fights—Hetch Hetchy, Grand Canyon, Glen Canyon, Tellico, and the Stanislaus—to name a few. Watershed battles and defining moments for our country and culture.

Thousands of fights against dam construction, winning and losing, large and small, led the environmental movement for decades and a few large dam fights continued into the early 1990s (Auburn, Animas-La Plata, Great Whale). The results are grim. More than 68,000 large dams (two stories or higher) and some two million small dams choke the rivers of America. Approximately 600,000 miles of what had been free-flowing rivers now lie stagnant behind dams.[1]

Although proposals for new dams still loom—touted under the benefits of clean energy, flood control, water supply and even recreation—in many regions of the country the tables are beginning to turn with regard to how our nation views dams.

Photo: Asahel Curtis, Washington State Historical Society

A young woman shows a steelhead caught in 1907, before the Elwha Dam was built.

"HISTORICALLY, QUESTIONS ABOUT DAMS HAVE BEEN LIMITED TO WHERE OR WHETHER TO BUILD THEM IN THE FIRST PLACE... IT IS TIME TO CHANGE THE TERMS OF THE DEBATE. IT IS TIME TO ASK WHETHER OR NOT EXISTING DAMS SHOULD BE ALLOWED TO REMAIN."

The Oregon Natural Resources Council eloquently described the changing perceptions of dams in a recent report, "Historically, questions about dams have been limited to where or whether to build them in the first place. Given what we now know, it is time to change the terms of the debate. It is time to ask whether or not existing dams should be allowed to remain."[2]

Now many river conservationists are doing just that, focusing their energies on dam removals as an essential and practical river restoration strategy. A few of these efforts have received significant national press, such as the hydroelectric dams on the Elwha River in Olympic National Park and on the Kennebec River in Maine, but there are many more dam removal efforts across the country. We learned of hundreds of documented dam removals and more in the process. For example, the National Park Service has removed more than 100 dams on rivers and streams affecting our national parks, and in just the last three years the Wisconsin Department of Natural Resources (DNR) has been involved in the removal of 15 dams from Wisconsin's rivers and streams.

Our intent is to share with you some of these stories and to encourage you and your organization to consider—or perhaps more likely to reconsider—dam removals as a potentially viable restoration strategy for your river.

Opportunities

The timing is right. A combination of several social, environmental and economic factors are responsible for helping to reframe the debate about dams. Hydropower dam relicensings, public safety concerns, severely declining

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fisheries, a growing demand for free-flowing river recreation opportunities, tighter purse strings on public works projects, and alternative technologies are some of the primary levers for dam removals.

One big opportunity to re-evaluate the existence of dams is the fact that more than 300 hydropower dam licenses across the country are currently up or will soon be up for renewal. Most of these projects were given original 50-year licenses back in the 1940s. Now that 50 years or so have gone by, those same projects must be relicensed, but under much closer scrutiny.

The Federal Energy Regulatory Commission (FERC) is now required to review hydro projects for adverse impacts on recreation, fish, wildlife and other river values, and to consider the recommendations of other federal agencies such as the National Park Service, the U.S. Fish and Wildlife Service, as well as those of state agencies. River advocates can intervene and participate in the process too. In most cases the licenses will be renewed with new operation requirements to minimize environmental impacts, but some relicensing processes will lead to dam removals (refer to article on page 7).

Why Removals?

Safety ratings for dams nationwide are frightening. In the National Dams Inventory, 32% of the dams have a "high" or "significant" downstream hazard potential, and the majority of these dams do not have an emergency action plan in the event of failure or negligent operation. The importance of public safety related to dams will only become more pressing as dams continue to age and deteriorate.

Thousands of small dams were built in the early 1900s and have been gradually deteriorating under the pressures of water and time. Today, many are severely degraded and pose a public safety hazard. For example, in Wisconsin there are about 3,500 dams, many of which were built during the 19th century to power grist mills or to provide flood waters for logging operations. Almost all of these century-old dams were built of timber and rock. Even though most have been rebuilt with concrete, the Wisconsin DNR estimates that at least half of the state's deteriorating dams will need repairs costing upward of $100,000 each during the next 10 years.[3] The situation is similar on Minnesota rivers and streams blocked by more than 1,000 dams.[4]

The indisputable connection between the dismal condition of our nation's fisheries and dams is another powerful argument for reassessing whether some dams should continue to exist. Perhaps nowhere is it more prevalent than in the Pacific Northwest on the heavily dammed Columbia and Snake Rivers, where 95% of the juvenile salmon fall victim to dam turbines and the slackwater pools that the dams impound.

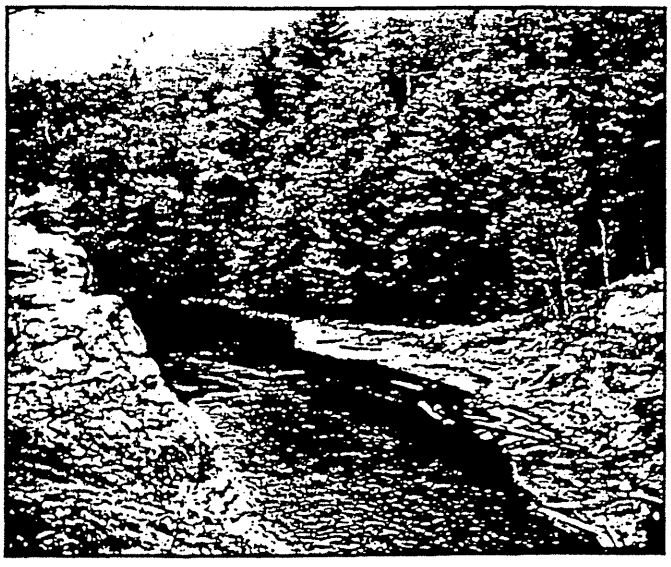
Anadromous fish of the Atlantic have also been hit hard. Blocked by more than 900 dams on New England rivers, Atlantic salmon populations have been reduced to less than 1% of their historic levels.[5] The socioeconomic values of commercial and sport fishing industries and Native American tribal treaty fishing rights are gaining more attention as anadromous fisheries continue to decline.

But it's not just anadromous fish that have been impacted by dams, so too have freshwater fish populations. One example is the successful restoration of fisheries on a reach of the Milwaukee River in Wisconsin. After being dammed for almost 70 years, the degraded Milwaukee provided habitat for a large exotic carp population, not much else. After Woolen Mills Dam was removed in 1988, water quality improved greatly and native gamefish species now flourish.

The growing demand for recreation on free-flowing rivers is another reason to take a closer look at whether many dams should exist. Rafters, kayakers, canoeists, fishers and other river enthusiasts are putting ever-increasing pressure on our limited, free-flowing rivers. The Welch Dam on the Cannon River was removed in 1994 and the Sandstone Dam on the Kettle River is coming down in large part to meet the growing demand for river recreation near Minneapolis/St Paul.

Another example is the many kayakers, canoeists and fishers who flocked to the free-flowing Merrimack River after the 90-year-old Sewalls Falls Dam near Concord, New Hampshire partially blew out in 1984.

Photo: Wisconsin DNR



The Wisconsin DNR removed Prairie Dells Dam in 1991 from the Prairie River to rehabilitate and improve trout fisheries.

These Merrimack River recreationists, attracted to their newly restored gentle rapids and glassy pools, provided the core of a diverse coalition that defeated a proposal to rebuild the hydropower dam in 1986.

Dams are often a wasteful use of public money. Payment for dam maintenance and removal often falls on public agencies because they either own the dams to begin with, or private dam owners do not have the funds to pay for repairs or removal. In many cases the results of economic analyses heavily favor removal. For example, Woolen Mills Dam in the Milwaukee River in Wisconsin would have cost $3.3 million to repair or $500,000 to remove. Sandstone Dam on the Kettle River in Minnesota would have cost $400,000 to repair or $200,000 to remove. Savage Rapids Dam on the Rogue River in Oregon will cost $17 to 24 million to repair or $11 million to remove and install irrigation pumps.

Dam repair costs are not just a one-time event. On-going maintenance, repeated dredging of filled-in reservoirs and the prospect of necessary removal in the future should also be included in economic analyses.

Finally, one of the most pressing and obvious arguments for considering dam removals is the obsolescence of many of the dams built over the last century. Thousands of grain mills and the dams used to power them are no longer needed. Often the power supplied by old, inefficient hydropower plants has been replaced by more efficient sources, but the old dams remain. More efficient irrigation practices and alternative non-structural flood control are other changes making many dams obsolete. Although many dams once served a valuable societal function, many are no longer necessary and do nothing but diminish ecological, aesthetic, and recreational river resources.

Expect Opposition

Despite the economic, safety, and ecological benefits of dam removal, they usually don't come tumbling down without some opposition. The public's emotional attachment, historical significance, perceptions of decreasing "lakefront" property values, private financial greed, and inadequate technologies are among the biggest obstacles to setting rivers free.

Many communities across the U.S. regard their local dams as a permanent and appropriate part of their landscape. To many people, dams are beloved landmarks and have historic value. Many residents have never seen their river free-flowing. According to dam safety engineer Richard Knitter of the Wisconsin DNR, who has led efforts to remove more than 30 dams in the last two decades, local resistance is usually high. Many of the small dams in Wisconsin rivers were the cornerstones of young Wisconsin towns and cities.

Photo: National Park Service

The Bluebird Dam stood 200' long by 56' high for 80 years in Rocky Mountain National Park. In 1982 it was declared structurally unsound. Shown here, 95% demolished.

Another frequent obstacle to dam removal is perceived decreases in "lakefront" property values. For example, "lakefront" property owners behind Salling Dam on the AuSable River in Michigan made a big fuss over potential property value losses associated with dam removal. The Michigan DNR researched local property values and found that AuSable River frontage was at least equal to, if not more valuable than, "lake" or reservoir frontage. "Lakefront" property owners behind Manitowoc Rapids Dam on the Manitowoc River in Wisconsin raised a formidable dissenting voice at the prospect of losing their reservoir, even though the decrepit dam was a major public safety hazard. The dam was removed in 1990, and residents now enjoy improved water quality and the restoration of 40 miles of excellent fisheries habitat.

Dam-created lakefront property owners are also frequently concerned about the "big, ugly mud flat" that will supposedly be left after a pond is drained. In reality, drained reservoirs rapidly revegetate.

Reservoir property owners are just one set of private interests who want rivers to remain dammed. Private hydropower developers will almost certainly put up a strong fight to keep their dams. They enjoy millions of dollars in profits annually by using public ▶

Primary Dam Purpose

	No. of Dams	
Recreation	23,185	31.3%
Fire & Farm Ponds	12,557	17.0%
Flood Control	10,801	14.6%
Irrigation	10,176	13.7%
Water Supply	7,226	9.8%
Tailings & Other	5,967	8.1%
Hydroelectric	2,166	2.9%
Undetermined	1,732	2.3%
Navigation	243	0.3%
Total	74,053	

Source: National Inventory of Dams 1993-94

waterways and pay virtually nothing for their use. Private irrigation districts also enjoy inexpensive or free use of public rivers.

Practical hurdles remain as well. Dam removal is still a relatively new business with many technological unknowns. Small-scale dams are relatively easy to remove, but large dams are more difficult. Regardless of dam size, sediment management is a critical issue in dam removals. Two big questions are: how much has accumulated behind the dam and how clean is it? If sediment is released uncontrolled, it can degrade habitat downstream. If there is a lot, it can even raise the riverbed and water levels downstream. If the trapped sediment is contaminated with heavy metals, removal costs can increase substantially.

Lack of funds may pose the biggest obstacle of all. Even though benefit-cost analyses frequently lean heavily in favor of dam removals, responsible parties, both public and private, often lack the funds to follow through. The Elwha River is a prime example, where the "proposed action" from the draft environmental impact statement is to remove two dams, but getting the $147 to $203 million in necessary funding is unlikely given the recent changes in Congress. The financial situation for state agencies is also usually sparse, with a few notable exceptions in Wisconsin and Minnesota. The Hydropower Reform Coalition is working on establishing innovative removal and decommissioning funds.

How to Begin

Each potential dam removal case is unique with its own historical, economic, political, and ecological issues. Regardless of the particulars, if you are interested in getting a dam removed from your river, you may want to start with some of the following steps.

Contact your state dam safety official. The Association of State Dam Safety Officials maintains a list and River Network has a copy. Check safety records and ranking of the dam. Research dam ownership and liability issues.

Contact other government agencies responsible for river resource management. Find out what other dam removals have already occurred in your state. Look into cost-sharing programs to assist in removals. Ask fisheries biologists to help you document the negative impacts the dam has on fisheries resources. Inquire about the possibility of an agency purchasing land around the dam site as a park.

Research the economics of the dam. This is an absolutely essential step. How much does it cost to maintain and repair the dam? Who pays? What economic values (if any) does the dam currently provide? What economic benefits could be realized if the dam were removed?

Research the historical state of the river before the dam. Visit your local and state historical societies. Get some old photos. Help your community visualize the free-flowing river resource it once had and can restore.

Collect information about other dam removal efforts. River Network can help you link up with other river groups. Other success stories may help convince your community of the benefits of dam removals.

Find some allies to work with. Fishing and boating organizations are obvious first calls, but chambers of commerce and offices of tourism may also be interested and supportive.

Removing dams is still a relatively new strategy in river conservation. Almost every case is viewed as precedent setting in some way. In his article, "Freeing the Kennebec River," Ted Williams described the hydropower dam relicensing process of Edwards Dam as "a case study of how Americans have looked on their rivers in the past and how they perceive them today....The dam's removal would mark a profound shift in America's philosophy about river management and river ownership."[6] He also insightfully says, "The notion that a dam doesn't *belong* just because it is *there* is revolutionary; yet it's catching on here and there." So take a closer look at the dams on your favorite river. It may just be time for them to come down.

Endnotes

1 Statistics from American Rivers, Inc. Washington, DC.

2 *15 Damnable Dams* by Oregon Natural Resources Council, Portland, OR.

3 "Flowing Free" by Matt Keefer, *The Milwaukee Journal*, June 10, 1990, p 27.

4 "Dam Yanking," *The Minnesota Volunteer*, March - April 1994.

5 RESTORE: The North Woods, Wild Atlantic Salmon: An Endangered Species, Concord, MA.

6 "Freeing the Kennebec," *Audubon* Sept/Oct 1993, p 36-42.

Rita Haberman became the director of River Network's River Clearinghouse program and editor of River Voices in 1990.

DRAFT FOR REVIEW

Please return review comments to:
Professor Stephen Born
101 Old Music Hall
925 Bascom Mall
Madison, WI 53706

DAM REMOVALS:
THE WISCONSIN EXPERIENCE

"While the dam may be lost, the river will endure"

Prepared by:

Water Resources Institutions and Policies Class (URPL/IES 865)
January 1996

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I. INTRODUCTION

Wisconsin was one of the "leaders" among states in developing its rivers for mechanical and hydropower energy. Since passage of the Mill Dam Act in 1840, thousands of dams have been built on our rivers and streams. They have become a central part of the landscape in many Wisconsin communities. Today, approximately 3,600 dams are found on Wisconsin rivers and streams (WDNR Dam Safety Inventory).

In recent years, many of these structures have fallen into disrepair, becoming a safety hazard to downstream communities as well as to those using the river for recreation. Their repair can impose large financial burdens on dam owners, which are often small communities or counties with limited budgets. Three to four hundred dams in Wisconsin will likely face repair costs of at least $100,000 within the next ten years (Knitter, 1995, pers. comm.).

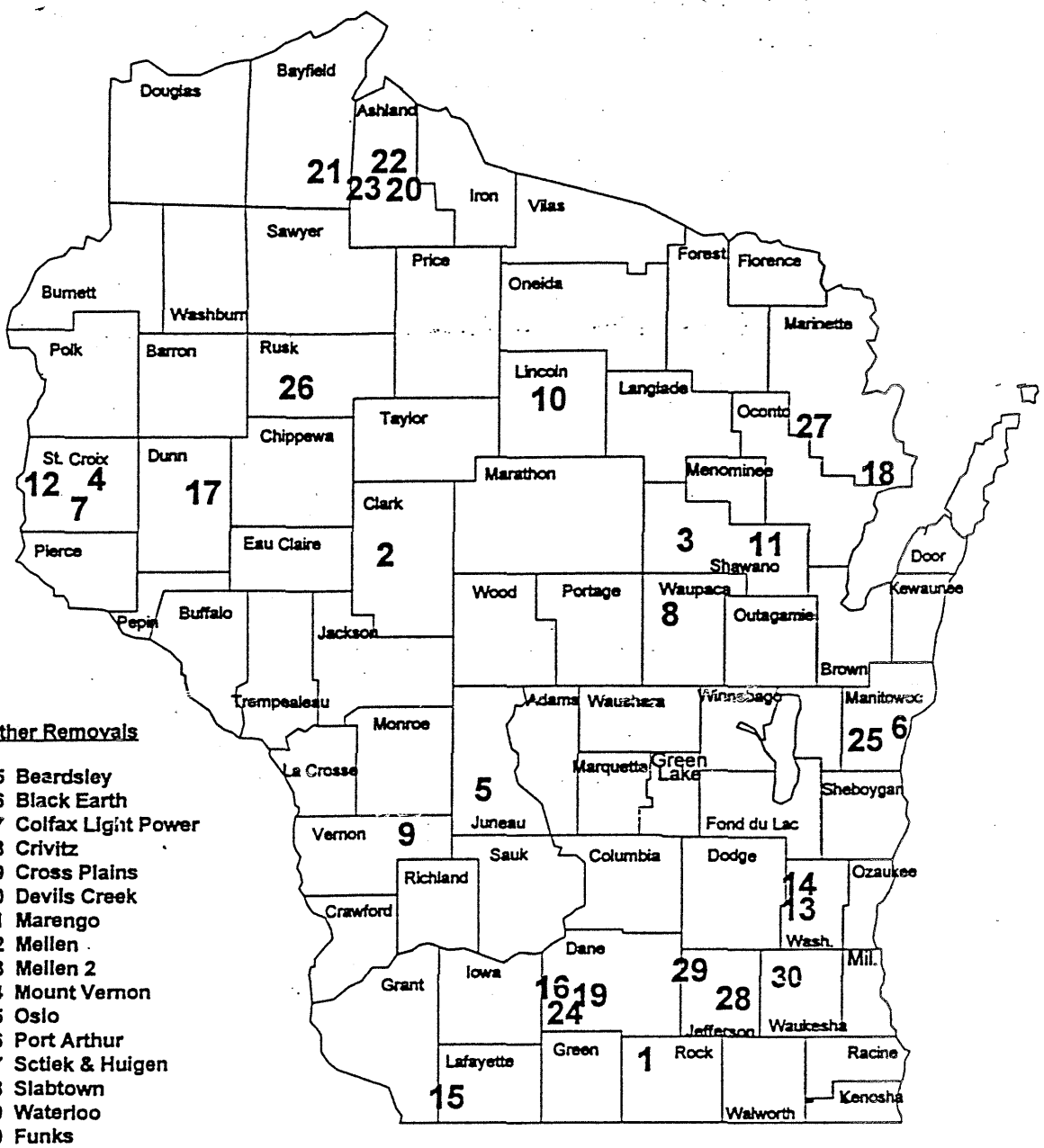
Recent ecological research indicates that dams can degrade water quality and fisheries and cause severe disruptions to entire river ecosystems, (Pacific Rivers Council, 1993; Ward and Stanford, 1987). As a result, dam removal is increasingly being considered as a means for ecosystem restoration by dam owners, conservationists, and natural resource agencies across the country. (National Research Council, 1992) Wisconsin is once again a leader, this time in its interest in removing dams and restoring free-flowing rivers.

The decision to remove a feature that has been a part of a community for decades is not without controversy and difficulty. Many mill dams in this state were built in the latter half of the nineteenth century, and are strongly associated with community identity. Over time, most of these structures have deteriorated and required repeated repair or reconstruction. Since 1965, the WDNR has documented 30 dam removals. However, far more have been repaired. For example, of 124 dams ordered for repair or removal since 1990 by the WDNR, only 19 were removed. Dam owners have made the significant financial obligation to repair the remainder.

This paper seeks to provide an overview of Wisconsin's experience with dam removals through a review of 14 dams that have been removed since 1965. From a synthesis of the 14 case studies, we identify the key issues that influence a dam owner's decision; and further, how state and local institutions influence these decisions. These issues include the laws, policies, ownership, economics, financing and other social and environmental factors.

Dam removals considered for this study were distributed throughout the state (Figure 1), and had heads between 6 and 45 feet with most less than 20 feet. The selected cases included some degree of controversy regarding the removal decision and typically included a broad range of issues. For each case study we have attempted to understand the perspectives of key stakeholders and interests as well as those of local government officials and state agency representatives. Based on the fourteen cases, we present key findings and a set of recommendations.

The Wisconsin experience described here, focusing on comparatively small dams, may also have important implications nationally. There are 70,000 dams in the U.S. larger than two stories tall and about *two million* smaller dams (Haberman, 1995). Many are deteriorating and face similar decisions regarding repair, replacement or removal. In 1982, for example, the Army Corps of Engineers



Case Study Removals	Other Removals
1 Fulton	15 Beardsley
2 Greenwood	16 Black Earth
3 Hayman Falls	17 Colfax Light Power
4 Huntington	18 Crivitz
5 Lemonweir	19 Cross Plains
6 Manitowoc Rapids	20 Devils Creek
7 McClure	21 Marengo
8 Nelsonville	22 Mellen
9 Ontario	23 Mellen 2
10 Prairie Dells	24 Mount Vernon
11 Pulcifer	25 Oslo
12 Somerset	26 Port Arthur
13 Woolen Mills	27 Sctlek & Huigen
14 Young America	28 Slabtown
	29 Waterloo
	30 Funks

Fig. 1. Dam Removals in Wisconsin

Table 1: Dams Removed in Wisconsin Since 1967 [1]

Name of Dam	Location (River)	County	Site	Hydraulic Head (ft)	Impoundment Size (acres)	Year Built	Year Removed	Owner at time of removal	Removal Cost	Other Comments
Mellon #1	Bad R.	Ashland	Rural	76	150	< 1914	1968	Lake Superior Power Co.	150,000	Trout stream restoration. Now a State Park with 50' natural falls.
Port Arthur	Flambeau R.	Rusk	Rural	17	250	1906	1968	Lake Superior District Power Co.	600,000	5 miles of cold water fishery developed.
Colfax Light & Power	Red Cedar R.	Dunn	Rural	21	52	1919	1969	Northern States Power Co.	120,000	Excellent small mouth bass fishery.
Schiek & Huigen	Hondsaw Crk.	Marinette	Rural	6	N/A	< 1935	1971	Privately owned	15,000	Restoration of trout fishing. Was 2 dams at this spot.
Beardsley	Madden Branch Crk.	Lafayette	Rural	12	N/A	< 1969	1992	Privately owned	12,000	Dam built without legal consent. Increased water quality.
Oslo	Manitowoc R.	Manitowoc	Rural	14	N/A	1862	1992	Abandoned	50,000	Additional 4 miles of steelhead fishing.
Slabtown	Bark R.	Jefferson	Rural	7	100	< 1918	1992	Privately owned	30,000	Increased waterfowl habitat.
Marengo	Marengo R.	Bayfield	Rural	17	80	1934	1993	Privately owned	120,000	Trout stream restoration.
Crivitz	Peshtigo R.	Marinette	Village Crivitz	18	N/A	1884	1993	Abandoned	35,000	Removed boating hazard.
Funks	Oconomowoc R.	Waukesha	Rural	5	80	1850	1992	Abandoned	40,000	Dam only partially removed. Increased waterfowl habitat and walleye and small bass spawning runs.
Carpenter Creek	Carpenter Crk.	Price	Rural	4	40	1939	1995	Abandoned	8,500	Dam built without legal consent. Removed boating hazard.
Mellen Waterworks	City Creek	Iron	Rural	12	N/A	< 1916	1995	City of Mellen	8,500	Dam was impounding no water at the time of removal. Removed hazard to roadway.

[1] This table represents dams removed between 1967 and 1995 that were not studied by the IES/URPL 865 group. In addition to these dams, approximately 30 dams were found in WDNR files listed as "removed" or "nonexistent" prior to 1965. Two dams (Parfrey in Richland County and Waterloo in Jefferson County) are being removed at the time of this writing, and are not included in this table.

Table 2. Available Funding Sources

Grant/Program Name	Description	Funding Source	Level of Assistance	Status	Other Comments
Municipal Dam Repair and Removal	Dam maintenance, repair, modification, abandonment and removal aid program for municipalities or inland lake protection districts	WDNR	Matching Grants 50% Limit. $ 200,000 per project	Active ($1.9 million for 1995/97 Biennium)	Statutory program. Allocations to the fund vary annually
Abandoned Dam Fund	Funding for removal of dams declared ownerless	WDNR	WDNR finances the entire removal cost	No allocation in FY 1996/97	Not a statutory program. Allocation by Joint Finance Committee on annual basis.
Small Cities Block Grant Program	Funding local governments for housing, public facilities and economic development projects.	Federal Funds (USHUD)	Matching Grants up to 50% Limit: $750,000	Active ($36 Million in 1996/97)	Administered by the Wisconsin Department of Development. Public facilities apply to dams.
Federal Aid in Sport Fish Restoration Act (Dingell-Johnson)	Sport fish restoration and boating access.	Sale of Inland Waters Trout Stamps (USDOI/DNR)	Cost-share 75 %	Active (Amount varies annually)	Federal program administered by the WDNR. Local units of government may apply.
Land and Water Conservation Fund (LAWCON)	Acquisition of land for public outdoor recreational areas and preservation of water frontage and open space. Outdoor recreation and park development .	Federal Funds	Matching Grants 50 %	No money allocated for the states in FY 1996.	Federal program administered by the WDNR. Applicable for restoration projects and park development around dams.
Urban Green Space	Provide open natural space in proximity to urban development; protect from development land with scenic, ecological or natural values in urban areas.	WDNR	Matching Grants 50 %	Active ($ 750,000 each fiscal year)	State Statutory program. Local governments, lake districts, Indian tribes and local conservation organizations may apply
Urban Rivers Grants Program	Acquisition of urban riverfront land.	WDNR	Matching Grants to 50 %	Active ($ 1.9 million, FY 1995/96)	State Statutory program. Local and Tribal units of Land along impoundments can be included as long as it is an integral part of a river corridor project.
Aids for the Acquisition and Development of Local Parks	Acquisition and development of public outdoor recreation areas.	WDNR	Matching Grants up to 50 %	Active	As of April 1996 dam-related projects excluded from this fund.
Recreational Boating Facilities Aids Program	Construction of capital improvements to provide safe recreational boating facilities. Assistance for feasibility studies.	WDNR	Cost-sharing up to 50 %	Active ($ 4,947,000 FY 1996/97)	State Statutory Program. Local Governments and lake districts and associations may apply.
County Conservation Aids	Improvement of fish and wildlife habitat or hunter/angler related facilities.	WDNR	Up to 50 % of eligible activities.	Active ($ 140,000 FY 1996/97)	State Statutory Program. Counties and Indian Tribes may apply.
Lake Planning Grants	Projects to collect and analyze information needed to protect and restore lakes and their watersheds.	WDNR	75 % of lake planning project up to $ 10,000	Active ($622,100 FY 1996/97)	State Statutory Program. Local Units of Government, lake districts and associations, and nonprofit conservation organizations may apply.
Lake Protection Grants	Projects for protection and improvement of water quality in lakes and their ecosystems	WDNR	75 % of project costs up to $ 200,000	Active ($ 1,353,000 FY 1996/97)	Same as above. Costs of structural repair and maintenance of dams explicitly excluded.
Clean Lakes	Lake water quality improvement and protection.	Federal Funds (USEPA)	Cost-sharing up to 50 %	Active (Amount allocated subject to availability of Federal funds)	Local governments and lake districts may apply. Projects must be in accordance with Federal Clean Lakes regulations

Table 3: Case Study Profiles

Name of Dam	Built	Removed	Last Owner	Head[1]	Impoundment (acres)	Original Use	Last Primary Use
Fulton	1849	1993	Rock Co.	9 ft.	49	Mill	Recreation
Greenwood	1905	1994	Unknown	10 ft.	N/A	Electricity	Recreation
Hayman Falls	1917	1995	Shawano County	12 ft.	80	Electricity	Recreation
Huntington	1903	1969	Northern States Power	28 ft.	60	Electricity	Recr/Elect
Lemonweir	1914	1992	Town of Lemonweir	7 ft.	11	Mill/Elect.	Recreation
Manitowoc Rapids	1854	1984	Private	8 ft.	10	Mill/Elect.	Recreation
McClure	1913	1968	Northern States Power	13 ft.	22	Electricity	Recr/Elect
Nelsonville	1860	1988	WDNR [2]	6 ft.	31	Mill	Recr/Mill
Ontario	1865	1992	Unknown	9 ft.	N/A	Mill/Elect.	Recreation
Prairie Dells	1904	1991	Lincoln County	45 ft.	83	Electricity [3]	Recreation
Pulcifer	1869	1994	Unknown	2 ft.	negligible	Mill	Recreation
Somerset	1850s	1965	Village of Somerset	17 ft.	83	Mill/Elect.	Recreation
Woolen Mills	1870	1988	City of West Bend	14 ft.	70	Mill	Recreation
Young America	1851	1992	Town of Barton	10 ft.	67	Mill/Elect.	Recreation

[2] WDNR had bought the dam from the last owner.
[3] Built for electricity but never used.
[1] Hydraulic head

Source: Wisconsin DNR files and interviews.

Table 5. Comparison of estimated repair and final removal costs

Dam Name	Total Removal Costs [1]	Repair Estimates	Cost Differential (Repair:Removal)
Fulton	$375,000	$900,000- 1 million	2.5
Greenwood	$80,000	$500,000	6.25
Hayman Falls	$272,000	$455,000-$800,000	2.3
Lemonweir	$190,000	$700,000	3.7
Huntington	$35,000	not evaluated	n/a
Manitowoc	$45,000	$30,000-$250,000	3
McClure	$50,000	not evaluated	n/a
Nelsonville	$62,000	not evaluated	n/a
Ontario	$47,000	$100,000-$200,000	3.2
Prairie Dells	$200,000	$725,000	3.6
Pulcifer	$400,000	not evaluated	n/a
Somerset	$75,000	$30,000	0.4
Woolen Mills	$80,000	$3.3 million [2]	n/a
Young America	$74,300	$313,000	4.0

1 Dollar value at time (year) of removal.
2 Estimates for removal were not developed independently of other infrastructure work.

WISCONSIN
DEPT. OF NATURAL RESOURCES
George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

1300 West Clairemont Avenue
P.O. Box 4001
Eau Claire WI 54702-4001
TELEPHONE 715-839-3700
TELEFAX 715-839-6076
TDDPHONE 715-839-2786

January 12, 1996

Roger Swanson
Plant & Earth Science Dept.
College of Agriculture
University of Wisconsin - River Falls
410 3rd St.
River Falls, WI 54022

SUBJECT: Lake George Sediments

Dear Roger,

I reviewed Anne Nelson's report on Cadmium and Chromium in Lake George sediments. The evaluation appears well supported and the concentrations agree with that from other impoundments in Western Wisconsin. The sampling is sufficient for initial reconnaissance purposes and can be used to help direct lake management plans. Please be advised that if a specific dredging proposal is ultimately developed, more sediment sampling may be necessary.

Sincerely,

Paul La Liberte
Water Resources Engineer

TROUT UNLIMITED

Kiap-TU-Wish Chapter

May 13, 1996

COPY

Tom Lovejoy
Wisconsin Department of Natural Resources
1300 W Clairemont Ave
P.O. Box 4001
Eau Claire WI 54702-4001

Dear Mr. Lovejoy,
I am writing in regard to the recent developments concerning the River Falls Municipal Utility hydro-facility on the Kinnickinnic River (project no. 10489-000). As you know, the City of River Falls' consultant has concluded that there is indeed a problem with flows stemming from maintenance procedures at the lower dam.

It is my understanding that the cost of repairs is approximately $36,000. As it states in the Federal Energy Regulatory Commission permit, "the Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values." Given the extremely valuable trout fishery below the dam, the Kiap-TU-Wish Chapter feels that the outlined repairs are reasonable.

The Kiap-TU-Wish Chapter also concurs with your decision not to allow dewatering of the impoundment during repairs. We believe this poses some risk to the downstream fishery. As to the question of our chapter helping defray costs of repair, we strongly believe that these costs are part of the price you pay in the hydro-electric business. If the City of River Falls is unwilling or unable to maintain their dams they should consider removing them.

I would like to thank you for the attention you have paid to this issue. It appears that we are close to a successful resolution to this nagging problem.

Sincerely,

Gary Horvath, President
Kiap-TU-Wish Chapter

GJH/gjh
cc: Rebecca Martin, FERC

ENGINEER'S ESTIMATE SHEET ____ OF ____

PROJECT: Lake George Berm ESTIMATOR: _____ DATE: _____

ITEM	UNIT	QTY	UNIT COST	TOTAL COST	ACCOUNT			
					GENERAL	UTILITY WATER	UTILITY SEWER	UTILITY ELECT.
Rip Rap	CY	13120	35	459200				
Haul Road	LS	1	4000	4000				
Geotextile Fabric	SF	8200	2	16400				
Crushed Aggregate	Ton	600	12	7200				
Asphalt	Ton	85	35	2975				
Silt Fence (Instream)	LF	820	4	3280				
Plantings	LS	1	5000	5000				
Restoration	LS	1	5000	5000				
				503056				
Engineering (Design + Construction)	15%			75458				
Contingency	15%			75458				
SUBTOTAL								
TOTAL FROM PREVIOUS SHEET								
TOTAL				653972				