

The Headwaters of the Mississippi

The project with the longest continual history in the St. Paul District has been the development of the Mississippi River above the falls of St. Anthony. It is not only the most representative project of the Corps in this district, but has also been the most controversial. Water management can be divided into four major concerns—navigation, water power, flood control, and recreational facilities—and the history of the Corps activities on the upper Mississippi reflects the conflicting interests of all four. Each of these human attempts to improve the river has had an impact on the environment. Flooded farmers and urban leaders, fighting Indians and milling magnates, dam tenders and dam builders have all contributed to the story of the controversial construction and maintenance of the six reservoir dams at the headwaters of the Mississippi River.

In 1875 the government engineer at St. Paul, Major Francis U. Farquhar, divided the Mississippi River above St. Paul into three sections and submitted an overall plan for the improvement of navigation.¹ The first section, extending seventy-eight miles from the Falls of St. Anthony to St. Cloud, received little attention. Less than \$15,000 was spent on removing boulders, building brush and stone dams, and preventing shore erosion between 1876 and 1879.² During these three years, one small steamboat tried unsuccessfully to open navigation on the promised five-foot channel.³ In spite of the Minneapolis Board of Trade's interest in navigation to St. Cloud, it is clear that district engineers put a low priority on this section of the river. Farquhar transferred the initial appropriation of \$25,000 for work on this stretch to the improvement of the apron below the Falls of St. Anthony. His successor, Captain Charles J. Allen, spent all appropriations after 1880 on the improvement of the far northern section of the river where logging interests were having difficulty floating timber south from the virgin forests of white pine.⁴

The second section of the river was a short run of about forty-two miles from St. Cloud to Conradi Shoals, an obstruction in the river about thirty-five miles below Brainerd. Major Farquhar estimated that it would cost \$1,957,785 to build four locks and dams to maintain a five-foot channel in this rough section of the river.⁵ No

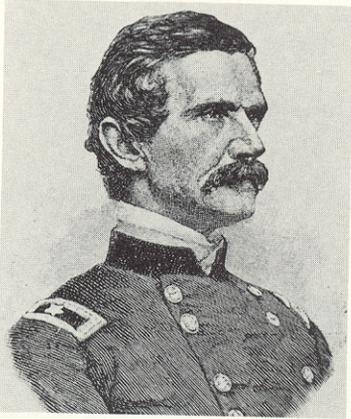
appropriations were ever designated for this expensive project. A railroad was completed to St. Cloud from Minneapolis in 1865, and Brainerd was served with a line from Duluth in 1871, eliminating the need for freight and passenger service by water.⁶

The third section of the Mississippi was a stretch of 217 miles from Conradi Shoals to Grand Rapids. This region consists of a large flood plain where the Mississippi slowly meanders through swamplands, heavy timber and hay meadows. Starting in 1871, steamboats served this section of the river for fifty years. Passable roads were difficult to build and the population never became dense enough to warrant railroad connections.⁷ The fertile flood plain was settled largely by farmers, who learned to endure the unpredictable and sometimes devastating high water which plagued the area.

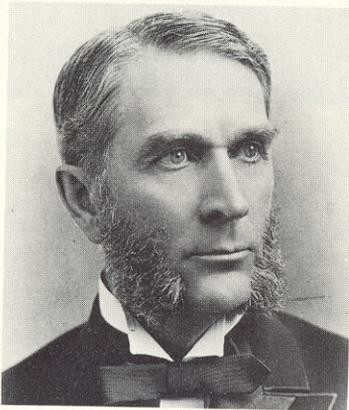
In order to aid steamboats serving lumber camps, the Corps began dredging, removing boulders, snags and over-hanging trees, and constructing cutoffs and wing dams between Brainerd and Grand Rapids. This work began in 1881 and continued until 1926. The village of Aitkin, fifty-five miles upstream from Brainerd and 130 miles downstream from Grand Rapids, is the dominant community in this section of the river.

The major work of the Corps on the upper Mississippi River, however, was not dredging and levee building, but the construction and management of a reservoir system. The concept of a network of dams to hold back spring thaws and early summer freshets in northern tributaries of the Mississippi River dates back to 1850 when congress asked a civilian engineer, Charles Ellet, Jr., to make surveys and prepare reports on flood control and navigation on the Mississippi and Ohio rivers. Ellet, an imaginative promoter who designed and built some of the first suspension bridges in the United States, recommended in his 1852 report that a series of reservoirs be built to regulate the erratic flow of the Mississippi.⁸

Ellet's report was sent to the Corps of Engineers, where it became part of a larger confrontation between the emerging civil and the established military engineering professions in the last half of the nineteenth century.⁹ In 1850 there were only 512 engineers in the United States, many of them graduates of West Point. By 1880 the civil



Captain A. A. Humphreys in a report on the Mississippi River in 1861 criticized the reservoir plans of Charles Ellet and formulated a Corps policy approving levees as the most practical and economical means for controlling floods and improving navigation.



William D. Washburn, a Minneapolis miller and United States senator, has been called the "father of the reservoir system" in northern Minnesota. He was successful in obtaining funds in the 1880's to build six dams to supply water for the mills at Minneapolis.

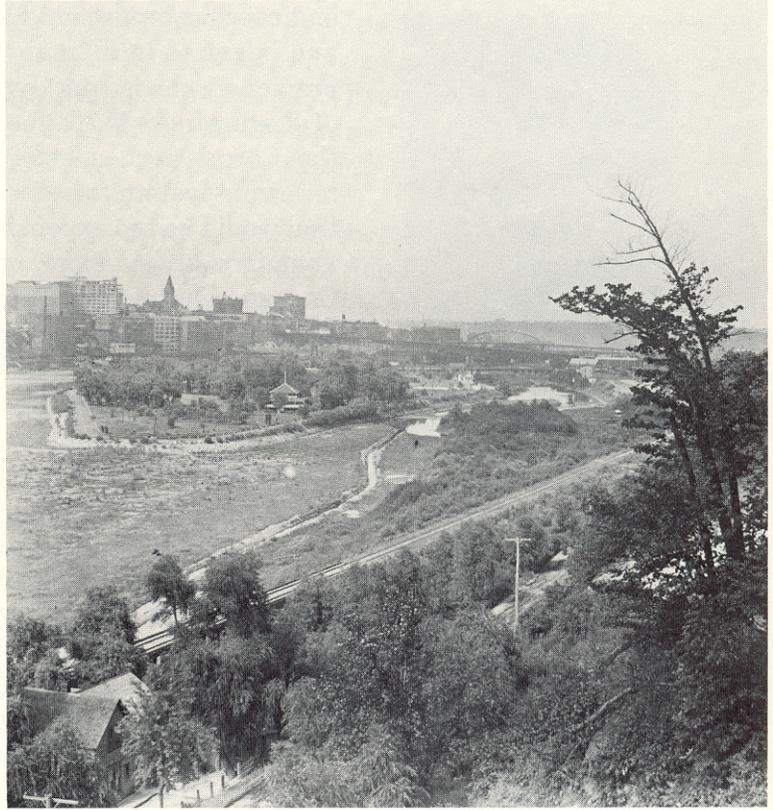
engineering profession had grown to over 8,000 members and began to fulfill many demands for large public works previously carried out by the small, elite group of the Corps of Engineers.¹⁰ W. Milnor Roberts, a civilian employee of the Corps, argued before Congress in 1857 that Ellet's reservoir system for controlling floods and aiding navigation would be too expensive, and further surveys should be abandoned.¹¹ A more comprehensive report issued by Captain Andrew A. Humphreys and Lieutenant Henry L. Abbot in 1861 also criticized the work of Ellet.¹² The major objection to reservoir systems was that the cost of building them was disproportionate to their benefits. Of course, congressional legislation required the Corps to appraise the benefits of reservoirs primarily in terms of navigational improvements.¹³

Senator William D. Washburn has often been called the "father of the reservoir system." Washburn moved from Maine to Minnesota in 1857. His brother Cadwallader who resided at La Crosse had acquired mining and lumber interests in both Wisconsin and Minnesota. The Washburns, well-educated, energetic and articulate, became effective promoters of industrial growth along the upper Mississippi. William represented Minnesota in the state Legislature and in both houses on Congress. Cadwallader became governor of Wisconsin. The Washburns, seeking to diversify their interests, invested in milling and water power development on the west side of the Falls of St. Anthony. By the end of the Civil War they owned a controlling interest in the Minneapolis Mill Company and had become leaders in promoting the future of Minneapolis as a manufacturing center.¹⁴

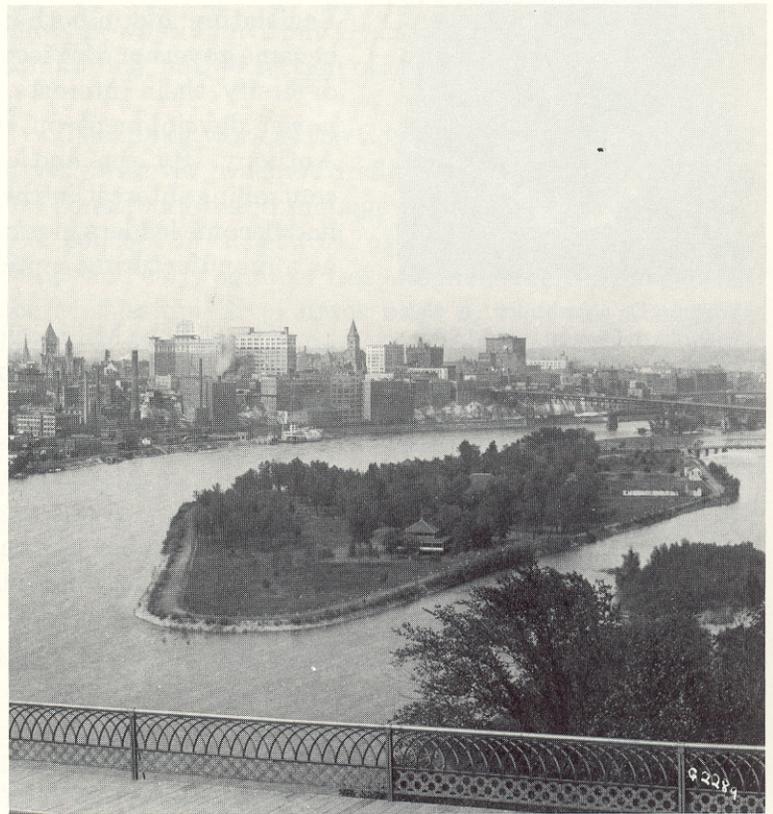
In 1857 the Minneapolis Mill Company contracted the services of a consulting engineer, Charles H. Bigelow, who designed the company's water distribution facilities after the successful Hadley Falls and Lowell mills at Holyoke and Lawrence, Massachusetts.¹⁵ By 1869 the west side firm was producing five times as much flour and twice the amount of lumber as the mills of the eastern side of the falls, and was beginning to introduce textile manufacture. The Washburns believed that by 1880 water power would make Minneapolis "second only to Chicago" as the leading Midwest metropolis.¹⁶

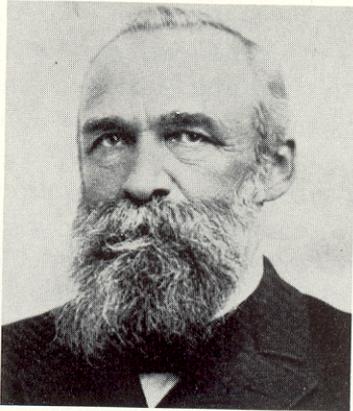
Their dreams of a great manufacturing city were somewhat disturbed in 1863 and 1864 when the water in the

The flow of water at Minneapolis-St. Paul in the 1850's dropped to less than 1,000 cubic feet per second. The concern for adequate water in the Twin Cities became critical again in 1911 when the Mississippi River, as pictured here, dropped to a low stage at Harriet Island.



In contrast to the last picture, this view of Harriet Island taken in 1915 shows the river at normal flow.





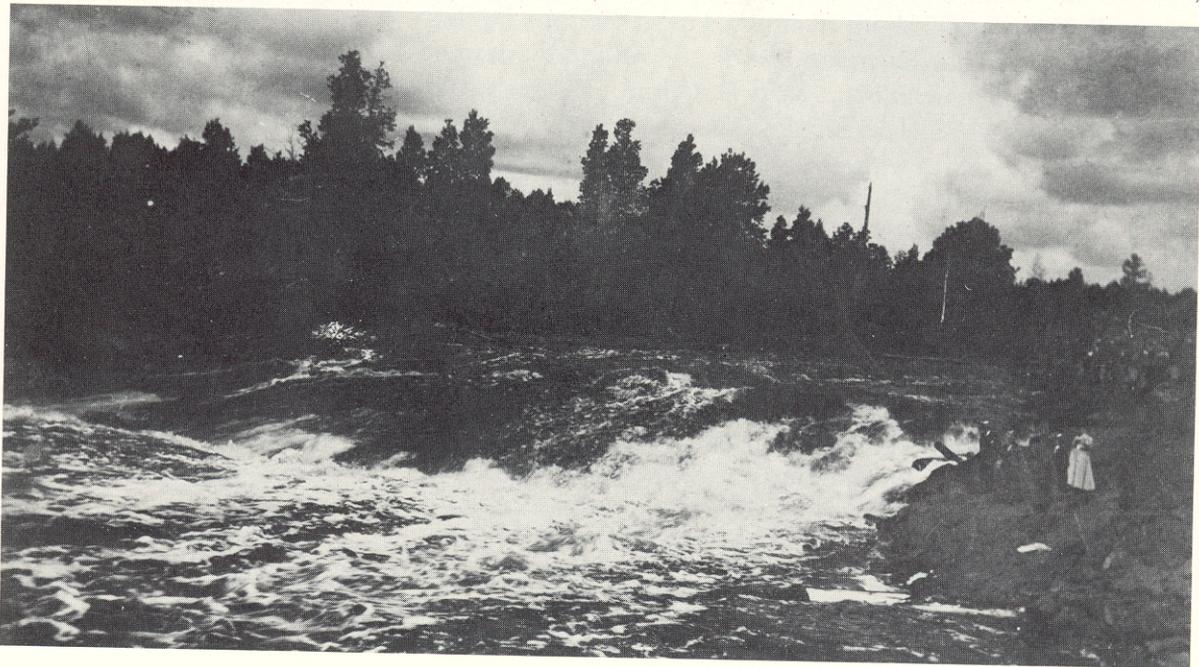
Franklin Cook, a civil engineer who worked for both the Minneapolis millers and the federal government, was responsible for the first survey of the headwaters reservoirs. In 1869 he recommended that William Washburn buy the land around Pokegama Falls as the key site for a water reservoir.

Mississippi at Minneapolis dropped to its lowest point in twenty-five years.

It was obvious that a constant flow would be aided by a reservoir system such as the ones developed for the Massachusetts mills at Holyoke and Lawrence. In 1869, William Washburn sent the company engineer, Franklin Cook, north to survey the upper Mississippi River for dam sites. Cook reported that a narrow channel at Pokegama Falls above Grand Rapids was a natural dam site.¹⁷ Later that year Washburn purchased forty acres at Pokegama Falls "in the belief that ultimately somebody—either the federal government or the state government would take up this improvement." He later claimed that his intent was to keep this property from "extortioners or grafters," with the design of eventually deeding the property over to the government. He did not have to wait long for federal action.¹⁸

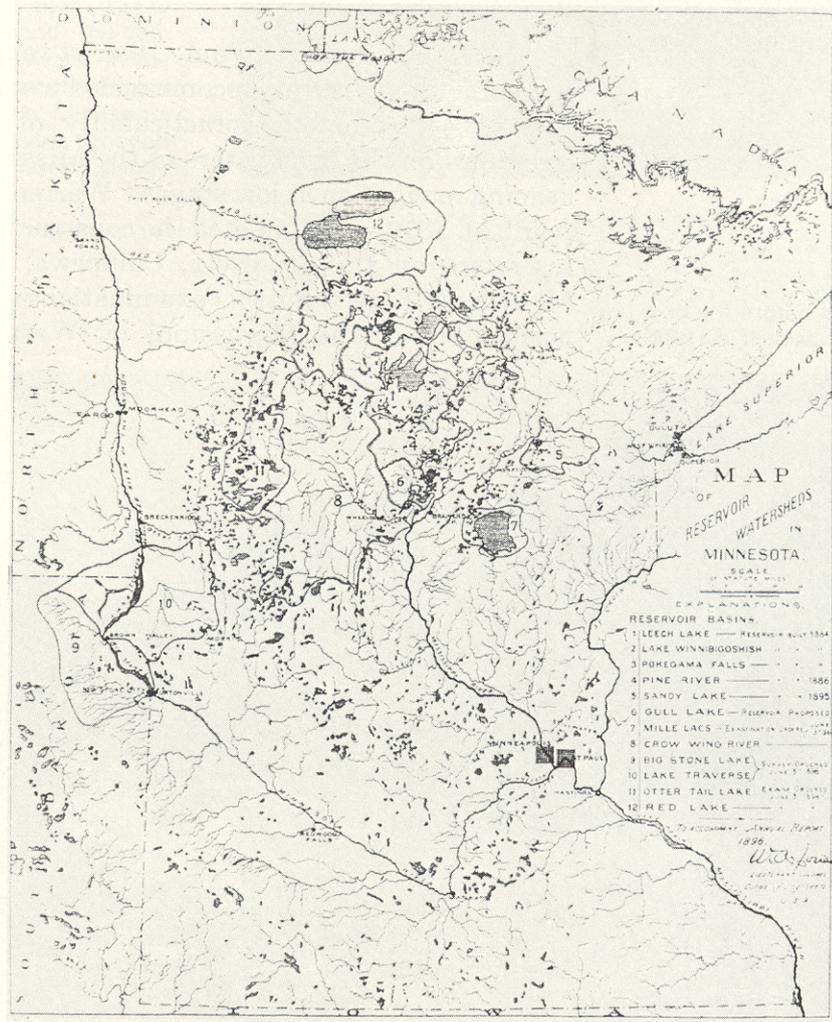
In 1868 the St. Paul District engineer, Major Gouverneur K. Warren, recommended a survey above the falls to ascertain "the practicability of forming large reservoirs on the headwaters of the Mississippi to aid in keeping navigation at low stages." Warren's later report of April 30, 1870, contemplated the construction of forty-one reservoirs on the St. Croix, Chippewa, Wisconsin and Mississippi Rivers. Further examinations were made of the headwaters of the Mississippi by Warren's successor,

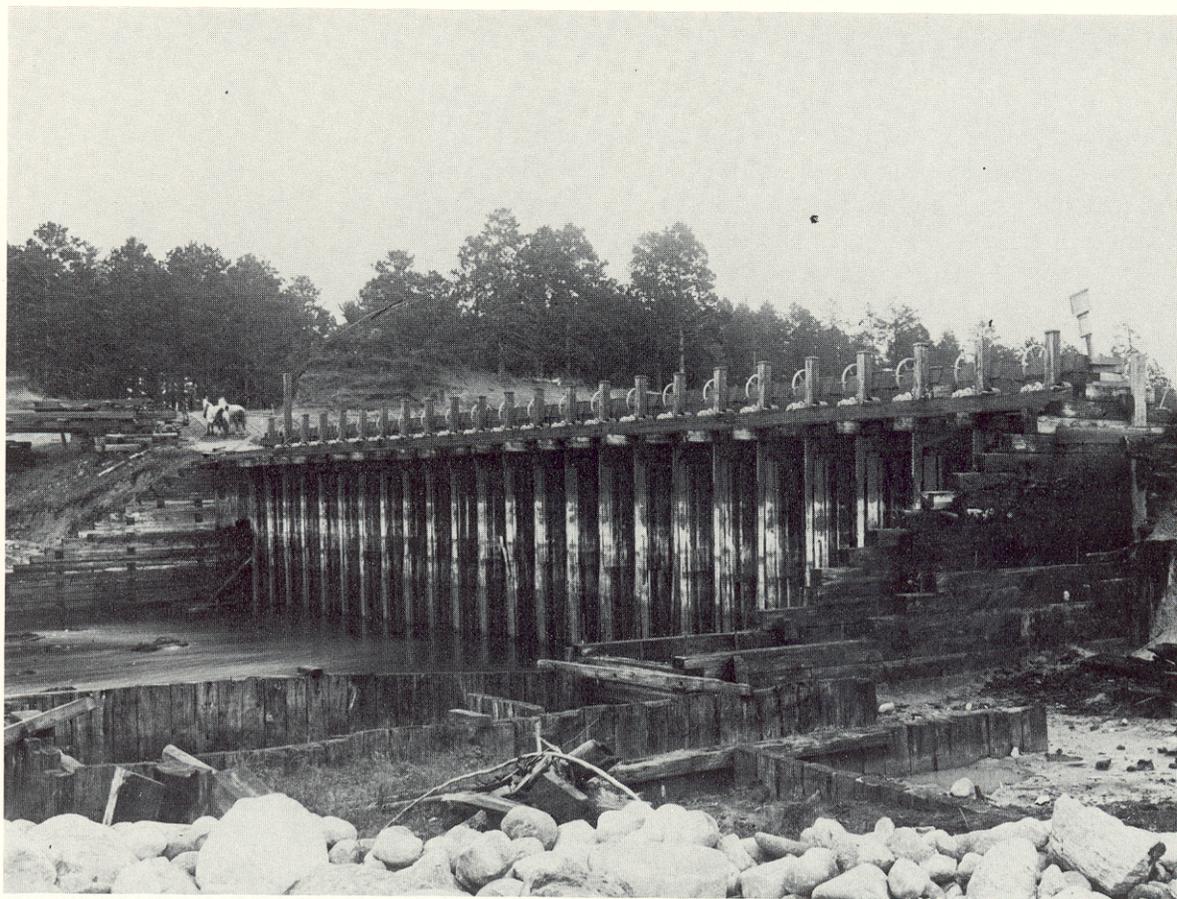
Pokegama Falls before the government dam was built in 1884.



Major Farquhar.¹⁹ During the 1870s, however, promoters of the reservoirs met strong opposition in Congress. House members were concerned that the building of these dams would benefit primarily the logging, milling and water power industries. They did not wish to stretch the "commerce clause" of the constitution beyond navigation to aid private industrial development. Thus, in 1878 Congress asked the district officer, Captain Charles J. Allen, to make an examination of the impact of a reservoir system on *navigation* in the Mississippi River. Because there was very little navigation above the falls, the report had to present a case for improving navigation below St. Paul to Lake Pepin. It was proposed that an experimental timber dam be built at the outlet of Lake Winnibigoshish which would increase water levels below St. Paul during low summer stages.²⁰

This map drawn under the direction of Captain Charles J. Allen, Jr., shows the potential sites for reservoirs in the upper Mississippi River watershed. Forty-one dams were originally contemplated.





The experimental dam at Lake Winnibigoshish was first constructed of timber in 1883-84. It was rebuilt using concrete in 1901.

William Washburn was elected to Congress in 1878. His fight there for a federally-funded reservoir system gained support from citizens in the Mississippi Valley who feared that railroads would eventually monopolize transportation. A number of conventions were held to discuss the decline of steamboat traffic on the Mississippi. River communities pressured their congressmen to maintain a viable alternative to the railroad. The River Improvement Association convention held in 1879 at Quincy, Illinois, for example, strongly endorsed the reservoir idea promoted by Washburn.²¹

It is ironic, that although the argument for the reservoirs was based on improving navigation from St. Louis to St. Paul, the St. Paul Board of Trade sent resolutions to Congress condemning the reservoir plan!²² St. Paul businessmen clearly understood the intentions of Washburn and others, fearing the industrial significance of federal water running the mills at the falls, especially since there was talk of the Minneapolis Mill Company leasing water rights for a new electric generating plant. Their



The Diamond Jo packets provided the only regular commercial freight service on the Mississippi below St. Paul after the railroads took over the north-south transportation routes after the Civil War.

anxieties were, of course, well founded for the first hydroelectric power station in the United States went into operation on September 5, 1882, at the Falls of St. Anthony, two years after the first reservoir bill passed Congress.²³

Though St. Paul commercial interests, logging companies and the railroads opposed a reservoir system at the headwaters of the Mississippi, Washburn's argument that there was little utility in dredging, building wing dams, digging cutoffs, and making other improvements on the lower Mississippi "unless there was adequate water in the channel" prevailed.²⁴ During the year in which Minneapolis celebrated the 200th anniversary of Father Hennepin's discovery of the Falls of St. Anthony, Congress approved an initial appropriation of \$75,000 to build a dam at Lake Winnibigoshish.²⁵ Further appropriations for the reservoirs were voted by Congress in the 1880s without any serious problems.

The construction of the Winnibigoshish dam began in the winter of 1881, and the Pokegama Falls and Leech Lake dams were commenced in 1883. Despite delays caused by poor transportation connections, severe weather, Indian problems and the need to work around heavy logging operations, the three dams were completed and functioning by 1884.²⁶ A fourth dam downriver from Grand Rapids on the Pine River outlet of the Whitefish chain of lakes was built in 1885 and put into operation in 1886.²⁷ When released water from the first three reservoirs reached the lowlands around Aitkin, it caused a back up in the Sandy River and into Sandy Lake. A dam was constructed on the Sandy River and formed a fifth reservoir.²⁸

The effect of the reservoirs on navigation below St. Paul is not as easy to document as the direct benefits to the water power interests at the Falls of St. Anthony. Before the completion of the reservoirs shortages of water curtailed the operation of mills at the falls. Many of the mills were considering a change to steam engines for power, and the sawmills did convert to steam and move upriver away from the falls.²⁹ The demand for water at the falls increased as more flour mills replaced sawmills. The

Pictured here is the timber dam at Leech Lake before it was replaced by the present concrete structure.





The deterioration of the Falls of St. Anthony can be seen in this photograph taken in 1900. Also shown is the Pillsbury "A" mill.

second largest milling operation in the world — Pillsbury's Plant A — opened in 1881 with a capacity of 7,000 barrels of flour a day. Water was so scarce that one person suggested that Orth's Brewery open its floodgates and run the milling machines with beer!³⁰ The shortage was believed to be caused by deforestation in northern Minnesota, lack of rain and a huge increase in the consumption of water by a rapidly growing metropolitan industry and population. St. Paul municipal utilities alone pumped over ten million gallons a day from the river above the falls.³¹ The average flow through the Twin Cities was 6,000 cubic feet per second. The highest recorded flow was 73,000 cubic feet and the lowest 500. In a normal year the flow would drop to 2,000 during January and February and peak at about 14,500 during May.³² The reservoirs increased the flow during August and September by forty percent and during October and November by fifty percent.

No man was more instrumental in taking advantage of the reservoirs after they were put into operation than William de la Barre. De la Barre received an engineering degree from the Polytechnic College in Vienna, Austria, and immigrated to the United States in 1867. He was hired



William de la Barre, an immigrant Austrian engineer, was the major force behind the development of the water power of the falls between 1885 and 1930.

by the Minneapolis Mill Company in 1883 during a period when it was leasing forty-one millpower. Minneapolis hydraulic engineers measured water usage by millpower, or the amount of power gained by thirty cubic feet of water per second from a twenty-two foot head, which equalled about fifty to sixty horsepower per millpower unit. Under de la Barre's direction, mill capacity was increased to 133-1/2 millpower in the next six years.

In 1889 the Pillsbury and Washburn interests merged the Minneapolis Mill Company and the St. Anthony companies into one organization. De la Barre took over the direction of these combined interests, which at that time grossed about \$90,000. In the next twenty years he increased the revenue of the new company fivefold by enlarging the millrace, building a power dam below the falls, and coordinating company water needs with the regulation of the reservoirs by the St. Paul District Corps of Engineers. It was estimated that the falls could provide about 100,000 horsepower of energy if every drop of water was utilized. When de la Barre took over, about 13,000 horsepower was used; by 1909 utilization was increased to 55,068 horsepower.³³

With the expansion of water power usage under de la Barre, and with the flow of water being regulated by the federal government, the power interests needed more water and requested further reservoir construction. The chief of engineers, however, could not justify more development. He refused to act on a recommendation for a reservoir at Mille Lacs Lake.³⁴ His negative stand was reinforced by the board of engineers report in 1887 which recommended that all plans for reservoirs on the St. Croix, Chippewa and Wisconsin rivers be abandoned.³⁵ In 1897 the district engineer suggested that reservoirs in northern Minnesota be limited to the five already constructed. However, the power interests wished to have one more dam at Gull Lake. The survey and examination of this site had been completed by the St. Paul office in 1898, but the district engineer, Major Frederic V. Abbot, advocated abandonment of the project because flowage rights would be too expensive to purchase.³⁶ Instead of building a new reservoir, Abbot recommended that the Corps ask for appropriations to replace the deteriorating timber structures of existing dams with reinforced concrete. He also asked for new surveys to establish the federal government's control over all flowage rights above and below each of the reconstructed federal dams.



The Winnibigoshish dam is depicted here under construction in 1899. Note the old wooden dam structure in the left portion of the photo.

By 1900 the dam at Lake Winnibigoshish was rebuilt.³⁷ The forms were removed from the concrete at Leech Lake in 1903 and in the following year the Pokegama dam was also finished. Each dam was built by a crew of about 300 skilled and unskilled workers. Laborers were paid \$1.10 a day. By 1909 the timber dams at Sandy and Pine rivers had been replaced. During this time agitation for the Gull Lake reservoir was kept alive by the business and political associates of de la Barre. In 1900 John S. Pillsbury deeded 1,000 acres of land at Gull Lake to the federal government.³⁸ In 1907 a dam was finally authorized with the provision that the government would not pay for any flowage rights. The St. Anthony Power Company took over the involved task of obtaining leases from individual property-owners for an additional 995 acres. These leases were deeded to the federal government in 1911, and the Gull Lake dam was put into operation the following year.³⁹

TABLE 2

COSTS AND CAPACITIES OF HEADWATERS RESERVOIRS

Reservoir	Capacity (cubic feet)	Previous projects		Existing projects		Total Cost
		Com- pleted	Cost	Com- pleted	Cost	
Winnibigoshish.	43,430,000,000	1884	\$214,000.00	1900	\$173,470.00	\$387,470.00
Leech Lake.	33,230,000,000	1884	171,805.00	1903	84,380.00	256,185.00
Pokegama.	5,260,000,000	1884	85,000.00	1904	126,030.00	211,030.00
Sandy Lake.	3,160,000,000	1895	114,000.00	1909	117,020.00	231,020.00
Pine River.	7,730,000,000	1886	97,000.00	1907	133,320.00	230,320.00
Gull Lake.	3,090,000,000	—	—	1913	86,826.00	86,826.00
Surveys and flowage rights.	—	—	—	—	160,939.49	160,939.49
Total new work.	—	—	681,805.00	—	881,985.49	1,563,790.49
Total maintenance.	—	—	100,857.10	—	62,567.00	163,424.10
Permanent indefinite appropriation for operating and care, Feb. 1, 1985, to end of fiscal year 1936.	—	—	—	—	967,197.08	967,197.08
Total.	95,900,000,000	—	\$782,662.10	—	\$1,911,749.57	\$2,694,411.67

From: Office of the Chief of Engineers
Annual Report, 1938

The Leech Lake dam after its reconstruction in 1909.

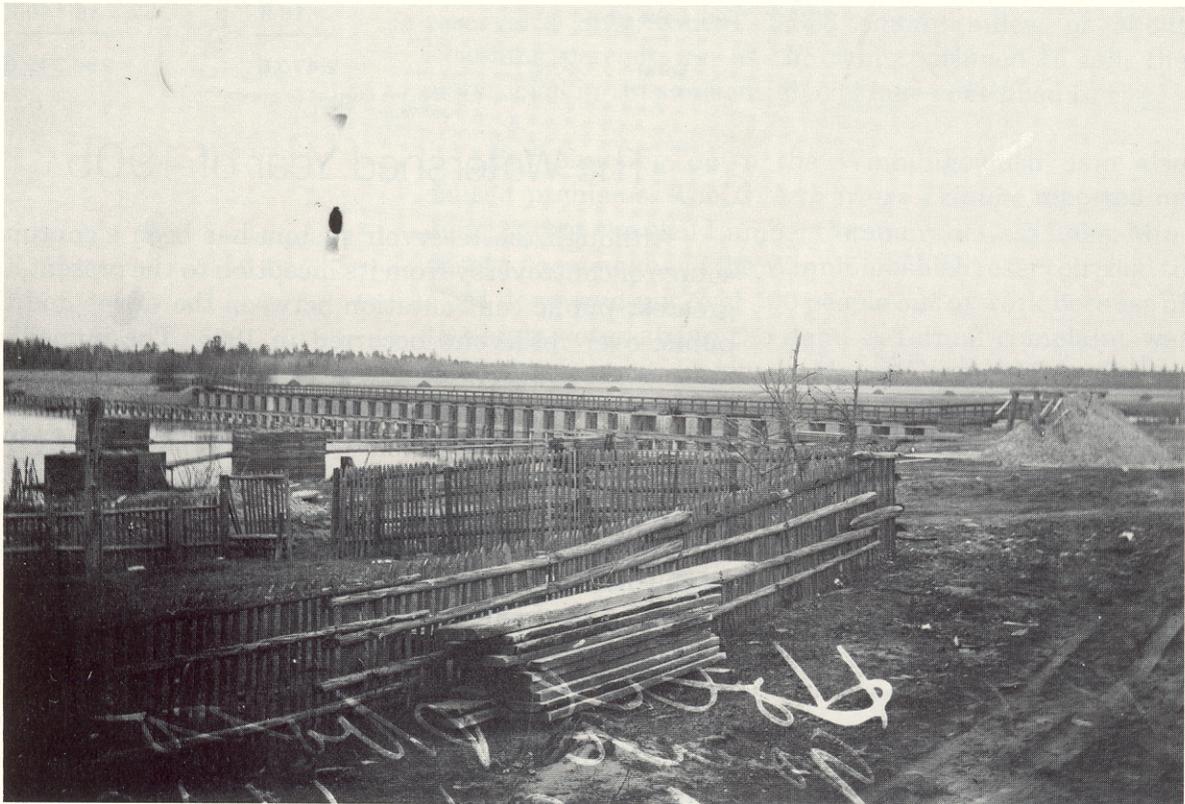


TABLE 3 **SIZE OF HEADWATERS RESERVOIRS**

Name of Reservoir	Outlet		Area		
	River	Above St. Paul	Water Shed	Original lake	Reservoir
		Miles	Square Miles	Square Miles	Square Miles
Winnibigoshish	Mississippi	408	1,442	117	179.4
Leech Lake	Leech	410	1,163	173	250.9
Pokegama	Mississippi	344	660	24	35.0
Sandy Lake	Sandy	267	421	8	16.6
Pine River	Pine	199	562	18	23.7
Gull Lake	Gull	168	287	20	20.5

From: Office of the Chief of Engineers
Annual Report, 1939

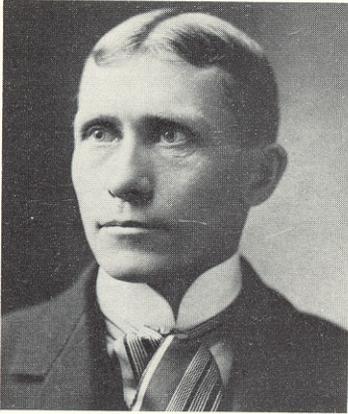
TABLE 4 **LANDS ACQUIRED FOR HEADWATERS RESERVOIRS**

Reservoir	Acres	
	Fee	Lesser interests
Winnibigoshish.....	0	82,464.1
Leech Lake.....	149.1	100,743.3
Pokegama.....	405.1	66,415.3
Sandy Lake.....	1,116.3	9,784.6
Pine River.....	781.5	21,794.5
Gull Lake.....	18.5	15,140.2
Total.....	2,470.5	296,342.0

From: Office of the Chief of Engineers
Annual Report, 1961

The Watershed Year of 1905

Although the reservoir system has been a continual source of controversy from its inception to the present, the greatest public confrontation between the Corps and the public over reservoirs occurred in 1905. The immediate cause of the conflict was a flood of devastating duration in the Aitkin area between Brainerd and Grand Rapids. It was the longest-lasting flood on record. The Mississippi River began to rise in June and remained over flood stage until late September. There are about 30,000 acres of rich black loam and peat soil in the Aitkin area. At an established flood stage of twelve feet, about 2,500 acres are flooded. At seventeen feet most of the 30,000 acres are under water. In 1905 the sixteen-foot flood stage lasted for nearly three weeks. From May through September, 25.62 inches of rain fell and the river never dropped below ten feet. Crops were not grown and many farms were abandoned.⁴⁰

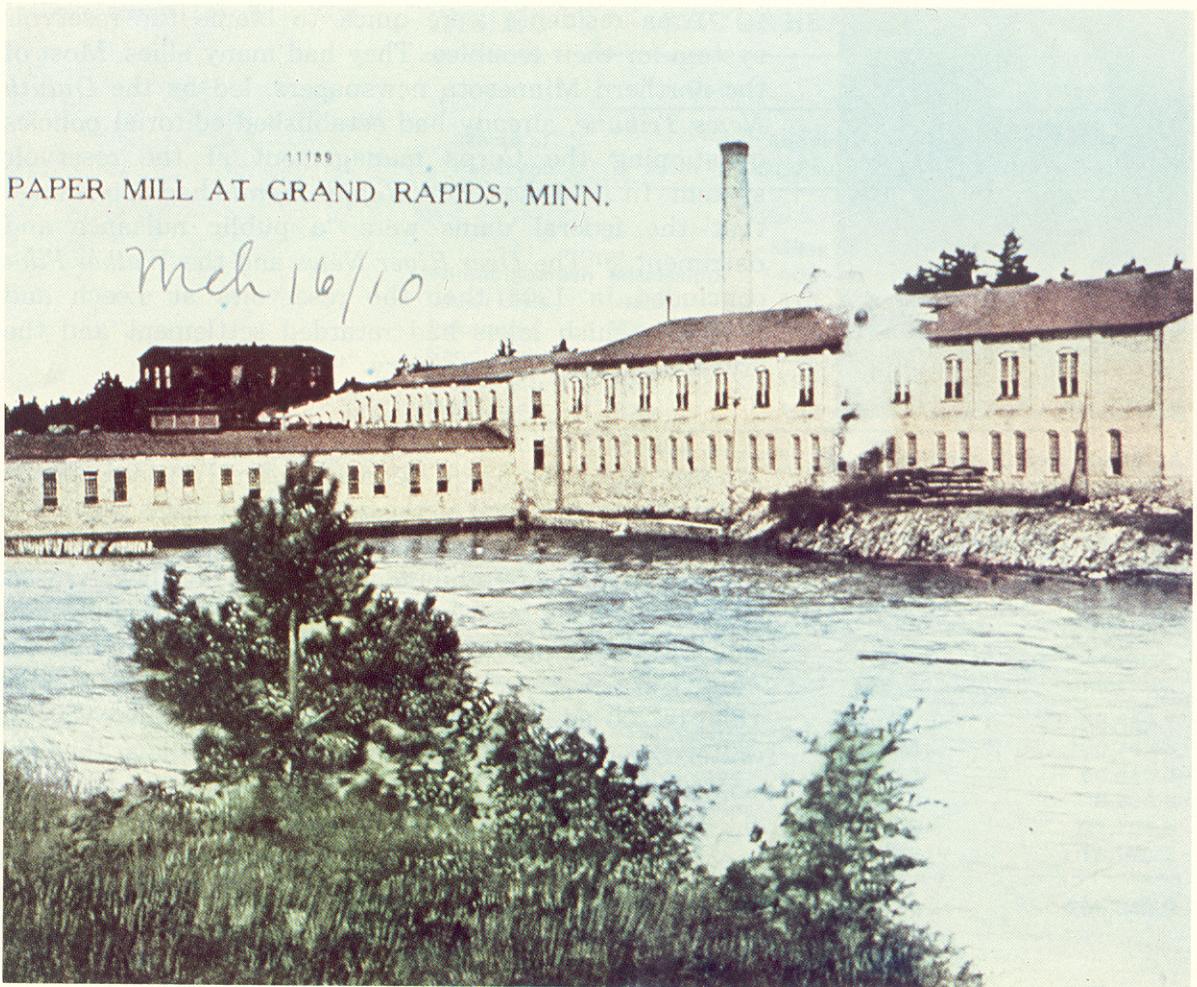


J. Adam Bede, congressman from the flood plain area around Aitkin, became a key spokesman for flood control in the 1905 controversy.

Area residents were quick to blame the reservoir system for their troubles. They had many allies. Most of the northern Minnesota newspapers, led by the *Duluth News Tribune*, already had established editorial policies questioning the Corps management of the reservoir system. In 1903 the *Grand Rapids Herald* had determined that the federal dams were “a public nuisance and detriment.”⁴¹ The *Deer River News* and the *Walker Pilot* concluded in 1904 that the reservoirs at Leech and Winnibigoshish lakes had retarded settlement and the “rural progress of the country.”⁴²

The *Aitkin Independent* opened the 1905 controversy on May 20 by calling on Representative J. Adam Bede to order the gates closed at the government dams because of the rising flood at Aitkin. But as later testimony documented, the Winnibigoshish gates had been closed. The Leech Lake reservoir was opened only to sluice logs and the Pokegama dam never discharged more than 400 cubic feet per second. Yet the flood at Aitkin rose to more than 14,200 cubic feet per second by July 6. Where was the water coming from? Citizens could not believe that the engineers had shut down the dams. Actually, there are 6,240 square miles of drainage area above Aitkin, and the reservoirs only control 3,688 square miles, or about fifty-nine percent. So as the rain continued to fall, the water level in this ancient glacial lake continued to rise.

But shutting down the Winnibigoshish dam also caused problems. The *Duluth News Tribune* reported on June 22 that the Neil Lumber Company of Cass Lake, Minnesota, located above the Winnibigoshish reservoir, had to close down and put over 100 people out of work because of the high water above the dam. A formal complaint was made to District Engineer Major George McC. Derby. Derby consulted with Senator Knute Nelson. He explained to the Senator that the Neil Lumber Company had built on government flowage lands and that the reservoir was not overflowing its designated boundaries.⁴³



During the heavy rains and floods of 1905 the paper mill at Grand Rapids had to close for lack of water power. The reservoirs on the Mississippi River above Grand Rapids were shut down to avoid flooding downstream, leaving the river next to the paper mill a dry run.

Keeping the dam gates shut not only caused problems above the reservoir, but also below it. The Duluth newspaper noted that because the Pokegama dam above Grand Rapids was only releasing 400 cubic feet per second, there was an inadequate water supply to run the paper mill in Grand Rapids. This business was forced to shut down for lack of water! With more than adequate rainfall and flooding conditions both above and below the dam, it appeared to be gross mismanagement of water resources when a solid business establishment was forced to stop production for lack of that free element nature was so generously sending from the skies!

The *Duluth News Tribune* concluded on June 22 that the reservoirs were of “no earthly benefit to any section, locality or person” except to those who found employment in their maintenance and operation. Duluth’s competition with the Twin Cities for economic control of this hinterland

was evident; since the reservoirs benefited mainly Minneapolis industries, Duluth businessmen felt that the whole reservoir system was a "curse to the great part of northern Minnesota" and should be either "abolished or operated intelligently."

It did not take the Twin Cities newspapers long to respond to the Duluth viewpoint. The *Minneapolis Journal* noted on July 3 that the big reservoirs of the north were filling up and that the only formal complaint of excess water had come from the Neil Lumber Company, which should have known better than to build a sawmill on the government flood plain around Cass Lake. The Duluth Commercial Club continued to complain about the excess water. According to the *News Tribune*, July 7, the club offered to fight the federal government and its engineers, even if Minneapolis would not.

In the meantime, Representative Bede's influence was felt in the Congress. The chairman of the powerful Rivers and Harbors Committee, Representative Theodore E. Burton, stated that "the whole river policy, from its inception in building the dam at St. Anthony Falls to the erection of the dams at the outlet of the lakes in the headwaters region is nothing but a huge and expensive graft worked by adroit, shrewd, scheming men upon the national treasury for their own enrichment."⁴⁴ Burton declared that the dams were built and managed under the pretense of aiding navigation, but were actually utilized for private profit by lumbering and water power interests.

The *St. Paul Dispatch* of July 15 charged that the northern newspapers were "manufacturing untruths" and that the whole situation at Aitkin was grossly misrepresented. Three days later, on July 18, this St. Paul newspaper reminded its readers that the reservoirs were built to aid navigation in the river below St. Paul. Admitting that there was not much navigation on the river, it nevertheless claimed that the presence of an alternative system for the distribution of goods kept railroad rates low for Minneapolis and St. Paul companies. It cost Pillsbury, according to the article, less to ship a barrel of flour to Boston than it would cost for most people to carry a barrel home from their local retail stores. The Twin Cities' viewpoint was that the reservoirs aided navigation and thus forced the railroads to be competitive in shipping rates for Twin Cities merchandise.



This cartoon appeared in the *St. Paul Dispatch* for September 14, 1905, in support of the reservoir system as a means of controlling high railroad rates.

The shipping cost argument was repudiated by the *Duluth News Tribune*. On July 11 it noted that steamboat traffic on the Mississippi below St. Paul had not grown to any extent since the reservoirs went into operation and that the railroads did not offer low rates because of the threat of a nonexistent competitor. To provide public support for their position in opposition to reservoirs the Duluth newspapers started a charity drive for the relief of Aitkin flood victims. They asked the governor of Minnesota to visit the area. Railroads, it should be noted, were quick to fund this appeal.⁴⁵ At this point Major Derby, the St. Paul District engineer, provided the *St. Paul Pioneer Press* with a release which claimed that the Aitkin flood was not caused by the reservoirs; on the contrary, the federal dams had actually held back sixteen billion cubic feet of water, "enough to make two rivers the normal depth and length of the Mississippi."⁴⁶

The controversy over abolishing the reservoirs was not limited to Minnesota. Authorities in Washington, D.C. also questioned the chief of the Corps of Engineers, Brigadier General Alexander Mackenzie, about their value. Mackenzie, who had served for a long time as district engineer at Rock Island, turned to Derby for a report on the reservoir question. The St. Paul engineer replied that seven separate factors were involved in the operation of the reservoirs: navigation below St. Paul, navigation on the Mississippi above the Falls of St. Anthony, the milling companies at Minneapolis, mills above Minneapolis, logging, riparian owners below the reservoirs and riparian owners above the reservoirs. Derby pointed out that Congress had authorized the building of the dams to regulate navigation, and that the control of water levels for that purpose often conflicted with the many other uses of the river.⁴⁷

Newspapers commenting on Derby's report noted that among other factors, the district engineer neglected to cite Minneapolis water power interests. Conspicuously lacking in his report was any mention of the close working relationship between de la Barre's St. Anthony Water Power Company and the Corps office.⁴⁸ Mackenzie's reaction to the report was to appoint a special engineering board to investigate the complaints and review the positions of the many involved parties. On the board were Major Charles L. Potter, Captain William V. Judson and Major Hiram M. Chittenden, who served as chairman.

In the meantime, the residents of Aitkin were having some second thoughts about the importance of the reservoirs. A lengthy letter to the *Aitkin Republican* published on July 27, from E. P. Wakefield, a "flooded farmer," summarized this change of spirit. Wakefield first demolished the reservoirs' critics. He pointed out that two men, G. G. Hartley, of Duluth and A. P. Williams, a county commissioner from Aitkin, wanted to abolish the reservoir system because they owned and wished to develop real estate in the area. The Aitkin farmer emphasized that because of Corps of Engineers activities the residents of the Brainerd-Grand Rapids area were provided with a navigable river which had been of considerable benefit to the economic growth of their region. He reminded recent residents that the floods of the 1870s "put anything we have since away in the shade" and that those farming the lowlands in the Aitkin area had always lived with the risk of raising crops on a natural flood plain. Finally, Wakefield wrote, "After studying the whole matter, I have come to the conclusion that the dams are a good thing. The only trouble is we have not enough of them." In a parting shot at critics of dams, he observed that if northern Minnesota did not have "this splendid system of dams" most residents, including those "doing the heavy knocking," would be demanding that Congress build them!

Earlier in the week at a public meeting much dissatisfaction was voiced by Aitkin citizens about the \$25,000 flood damages fund drive. Instead of supporting a charity campaign, someone suggested, they should ask Congress to authorize the construction of a nine-mile diversion ditch from Waldeck to Pine Knoll which would shorten the Mississippi by fifty-six miles.⁴⁹ Such a project would avert spring floods and would provide a shorter channel for reservoir water during the navigation season.

The editor of the *Aitkin Age*, on August 1, summarized the consensus of his community under four points. The negative tone had disappeared; all of his ideas were constructive. He explained that the people of Aitkin favored the system of reservoirs; wanted the federal government to build a diversion canal; supported the construction of a new reservoir on the Prairie River; and hoped that the newly appointed board of engineers would set up guide-lines for better flood control management within the existing system.

During the last week of July, Twin Cities papers strengthened their defense of the reservoir system. The *St. Paul Dispatch* sent a reporter to the area. He reported in the paper on July 25, that "there has not been one single house, barn, outhouse or chicken coop washed away during all the recent high water." The Duluth publicity scheme of collecting money for flood damage was called into question. The *Minneapolis Tribune* on July 25, published an interview with the Twin cities' most famous engineering expert, William de la Barre, who claimed that the idea of abolishing the reservoirs was "preposterous, childish and silly." Appearing to speak as a disinterested party, he castigated the "vicious and utterly indefensible" attacks on the competence of the government engineers. De la Barre was quite candid, however, in admitting that the chief beneficiaries of the reservoirs were the people of Minneapolis.

As the controversy began to diminish, a new event occurred. The *Duluth News Tribune* reported on August 6 that Major Derby had ordered the gates to be opened on the Winnibigoshish dam in order to relieve the flood problem at Cass Lake. The *Duluth Herald* on August 9 criticized this action, suggesting that the dams had been structurally damaged. Instead of conserving an adequate head of water for milling businesses such as the Itasca Paper Company, the "water was being wasted." In the meantime, the people around Walker had organized a commercial club to fight for the lowering of Leech Lake, which had flooded lake residences and was overrunning some of the streets in Walker itself.

Releasing the water in the reservoirs, of course, had its effect on Aitkin. Where was the flood coming from now? It had not rained in the Aitkin area for weeks. The *Duluth News Tribune* reported on August 10 that the federal government was "deliberately deluging this section with



Major George M. Derby was district engineer during the controversy of 1905 and encouraged Minneapolis businessmen to use their political influence to insure the continued operation of the reservoirs by the Corps in order to provide water for the manufacturing establishments located at the falls.



State Senator C. C. McCarthy challenged the experience and knowledge of military engineers in the area of business methods and profits. He advocated a transfer of the reservoirs from the Corps of Engineers' control to a special state committee made up of businessmen.

water." Representative Bede, reflecting the exhausted patience of his Aitkin constituents, called upon Congress to turn the management of the reservoirs over to the state of Minnesota. His proposal was supported by state Senator Chauncey C. McCarthy who observed that "the ordinary army officer, by his military education, is totally unfitted to have much to do with business."⁵⁰

Meanwhile the board of engineers appointed by General Mackenzie toured the reservoir area and met with local groups. The people of Aitkin asked for a diversion channel. Major Chittenden reminded them that a former district engineer, Major Frederic V. Abbot, had surveyed such a project in 1900 and had recommended against construction because only a few owners of large real estate tracts would directly benefit from an estimated federal investment of \$1,796,000.⁵¹ While the board was in the Aitkin area, Major Derby wrote a letter to the *Aitkin Republican*, explaining in detail the district's reservoir management policies. Derby said that it was necessary for 4,200 cubic feet per second to flow through the Pokegama dam, because recent rains and run-off were filling the upper reservoirs faster than they could be drained.⁵² Thus, the Mississippi continued to flood property at both Deer River and Cass Lake as well as at Aitkin. It was obvious that nature was putting on a full weather show for the examining board.

During the visit of the board to northern Minnesota, on August 19, the *Duluth News Tribune* forecast the final report of the special commission. Full support of the current government engineering policies was predicted. The reservoirs were likened to the "rain-making business." When the water was available for the benefit of farmers, loggers, millers, power interests and navigation, the reservoirs were given the credit; in times of flood or low water an "act of God" was blamed. The paper went on to observe that if the primary purpose of the dams was to underwrite the sluggish business of the "Diamond Jo" stern-wheel packets, then the government should stick to improving navigation and get out of the "flour-milling business."

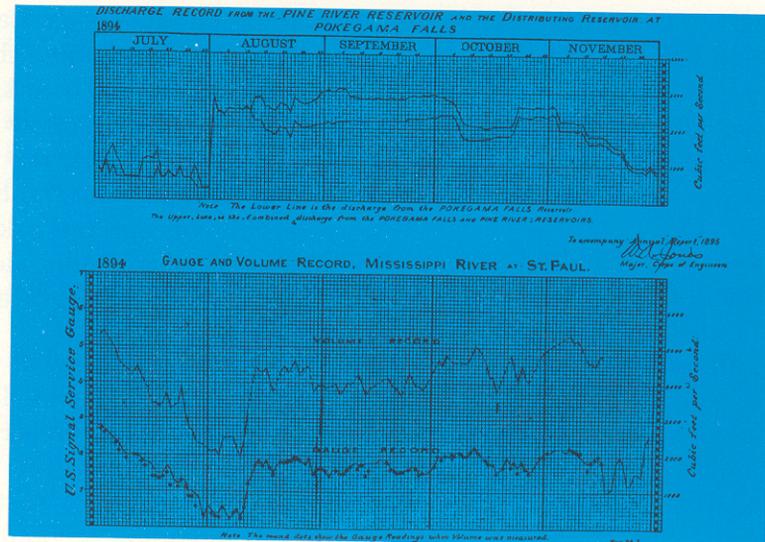
By the end of August the "reservoir question" had become a major preoccupation of both state and federal officials. Major Derby was very concerned. He was quoted in the *St. Paul Pioneer Press* on August 25 as saying "I believe that nothing short of a decisive effort now on the

part of St. Paul and Minneapolis will save the reservoirs when the report of this committee is sent to Congress." Derby presented statistics to arouse the self-interest of metropolitan businessmen. His main argument centered on the lower shipping rates enjoyed by the Twin Cities. In the *St. Paul Pioneer Press* on August 26, Derby was said to have agreed with the Duluth position that the mill-owners of Minneapolis received the greatest benefits from the reservoirs. He urged Minneapolis business leaders to defend the continued maintenance of headwaters dams as federal projects.

The best analysis of the summer's controversy was published in the *Aitkin Republican* in September. Going over the records as far back as the 1850s, the paper presented a detailed study of the relationship between the Aitkin floods and the operation of the reservoirs. Government gauge reports indicated that normally only 3,000 cubic feet per second came from the reservoirs in July and August, while an additional 11,000 cubic feet came "from the ten tributaries of the Mississippi which unite with the Mississippi River between Pokegama Falls and Pine Knoll." According to this article, the real culprit was the lumbering industry. After the pine forests were destroyed, big timber foliage and root systems no longer held back the run-off of heavy spring and summer rains. In addition, loggers opened many of the lumber dams on the Prairie, Split Hand, Swan, Willow, White Elk, Little Willow, Rice, Mud, Cedar and Sisabagama rivers, releasing additional reservoir water to flow into the Mississippi. Corps gauge readings, discharge statistics, meteorological observations, and records of run-off, evaporation, absorption and seepage were all praised by the newspaper for their "remarkable accuracy" and careful tabulation. For those who once wished to abolish the reservoirs but were now calling for better management, this newspaper review was meant to provide a "notable demonstration" that the operation of the dams had been in the best interests of flood control. The article gained wide attention when it was reprinted in the *Minneapolis Journal*, September 9, just before the public hearings were held by the board of engineers.

More than sixty businessmen came from Duluth, Cass Lake, Aitkin, Grand Rapids, St. Paul and Minneapolis for three days of hearings at the district office. Present, too, were representatives of the governor, the state legislature,

These government water gauge charts were published in the *Minneapolis Journal* on September 12, 1905, as part of the evidence the newspaper gathered in support of the Corps of Engineers' management of the reservoirs during the crucial flood period.



the Upper Mississippi Improvement Association, the railroads and the steamboat interests. Former Senator Washburn and Representatives Loren Fletcher, J. Adam Bede, John Lind and Frederick C. Stevens were also present. Major Chittenden opened the morning session on September 11 by asking Major Derby to testify on headwaters management policies. Derby reminded the board, according to the *Pioneer Press* on the 12th, that his authority came from congressional statutes designating navigation as the primary purpose for the construction and operation of the reservoir system.

Dr. C. S. Kathan of Aitkin reported in the afternoon session that the management of the reservoirs was "a crime against hard working people." He submitted figures showing that flood damages would have been less if the Corps had not begun to release water in late July. He asked the board to revise management policies and construct a drainage ditch to take surplus water away from the Aitkin vicinity. The *Minneapolis Journal*, September 12, quoted the country doctor as saying that the water that "drowned out Aitkin settlers" provided power to run streetcars in Minneapolis and yielded profits for "wealthy corporations."

William Lyon, speaking for the lumber companies around Cass Lake, cited the great expense and inconvenience to them when water was retained in the Winnibigoshish reservoir. Citizens from Walker complained of the high water level at Leech Lake, but under cross-examination by the engineers could not document their case with exact figures. An agent of the Indian

reservation at Leech Lake said that the Indians had suffered hardship when their lands were inundated. When questioned by the board, he revealed that complainants had all been given new land allotments. Chauncey C. McCarthy, representing the Itasca Paper Company of Grand Rapids, was the last to testify. He supported the reservoir concept, but asked that consideration be given to the needs of all mills along the river not only those of Minneapolis manufacturers.⁵³

The second day of hearings was opened by Major Chittenden who asserted that the St. Paul District office had operated the reservoirs in the best interests of navigation and that the board supported continuation of the present policies. Testimony during the day strengthened his argument. Representative Stevens of St. Paul asked for opponents of the reservoirs to substantiate their views or cease to ask for the system's abolishment. Stevens claimed that 370 million dollars in agricultural production and 300 million dollars in manufacturing output were directly related to the navigation and power interests along the river. This sum included the value of thirty-five million feet of sawed lumber and twenty-five million barrels of flour produced annually. Dr. Kathan asked Stevens if the river was maintained as a "menace to the railroads" to keep down shipping rates. According to the *Minneapolis Journal*, September 13, the congressman replied, "that is just it." He added that Congress spent over sixty million dollars "for that purpose" every year.

Rome G. Brown and William de la Barre testified that the management of the reservoirs did not always suit their interests, but they were satisfied with the competence of the government engineers and did not advocate any change in policy. A. C. Bossart of Grand Rapids asked for an extension of the system. He had expanded his paper mill, expecting a surplus of water. Water power interests from Sauk Rapids and Little Falls also requested that the existing system of operation be continued.⁵⁴

The Minneapolis Commercial Club summarized the urban position. It stated, "We approve the management of the system as it has been conducted, being satisfied from such investigation as we have been able to make and from the discussion at this hearing, that such management has been strictly in accordance with government regulations and at the least possible loss to private interests." Similar

support came from William A. Meese, representing the Upper Mississippi Improvement Association and the government arsenal at Rock Island, Captain Day of the Planet Steamer Line, and Captain George Winans of the Burlington Lumber Company and the Northwestern Paper Company at Cloquet.

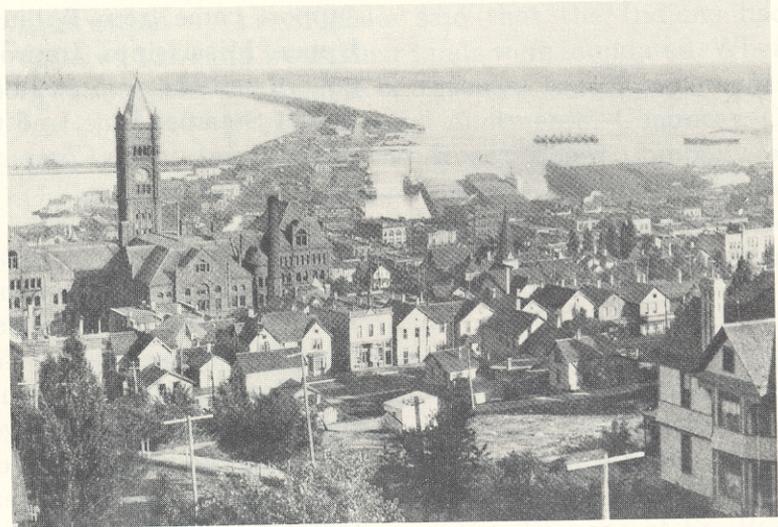
The final day of testimony was highlighted by an address from the "father" of the reservoir system, William D. Washburn. He reminded the commercial interests of Duluth that their harbor had received much more funding from the federal government than had been appropriated in the support of river improvements for Minneapolis and St. Paul. He predicted that some day the whole Mississippi River would have a series of locks and dams, and he foresaw the time when ocean-going vessels would bring raw materials from all over the world to Minneapolis and return with the manufactured commodities of the Twin Cities.⁵⁵

The issues which produced the 1905 controversy and subsequent hearings were thoroughly discussed, but never settled. Competing interests which use the river continue to complain about the operation and management of the reservoir system, but since 1905 few have demanded that the reservoirs be abolished. It is evident that powerful interests have a huge investment in a uniform flow of water through Minnesota. It is also clear that some regulatory force must work out equitable compromises so that no one entity can monopolize this resource.

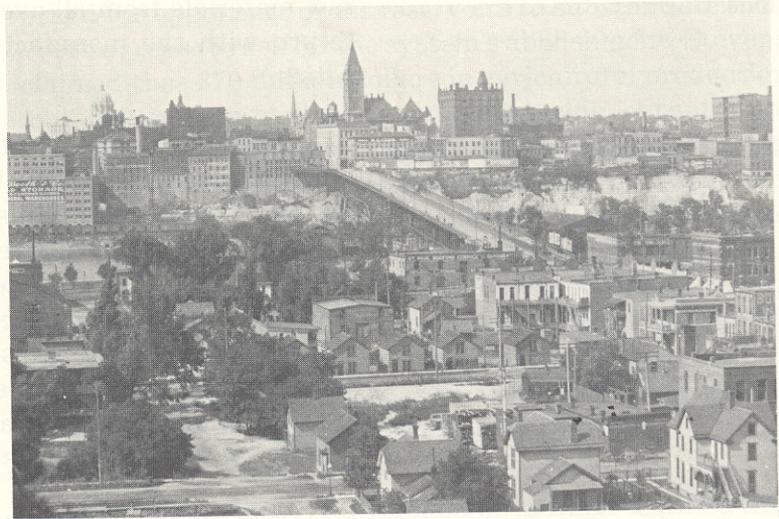
Some papers, like the *Itasca County Independent* on September 17, called the 1905 hearing a "farce" and asked President Theodore Roosevelt to intervene on behalf of "feeble folk" who could not fight the powerful corporate influences. Others like the *Duluth News Tribune* (September 20) made fun of the government report by noting that all other sections of the country fought floods by allowing the water to run downhill, but that in northern Minnesota floods were dammed up so that water would cover lands for long periods. This newspaper also suggested, on October 2, that much of the dammed water did not reach the Gulf of Mexico, but seeped into the Red River watershed, causing additional floods in that section before it flowed into Hudson Bay!

The urban rivalry of Duluth and the Twin Cities was evident throughout the controversy. Both metropolitan

The city of Duluth, pictured here in 1907, hoped to overtake the Twin Cities as the center of transportation and milling in the Upper Midwest.

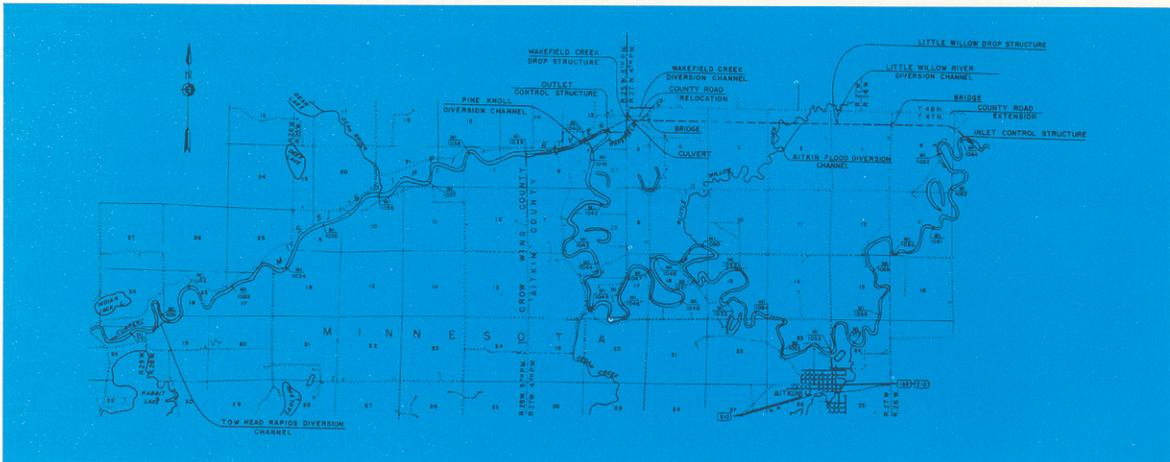


The city of St. Paul, pictured here in 1907, was the political and commercial center of the Upper Midwest at the turn of the century.



The city of Minneapolis, pictured here at about the same time, was the industrial and manufacturing center of the St. Paul District.



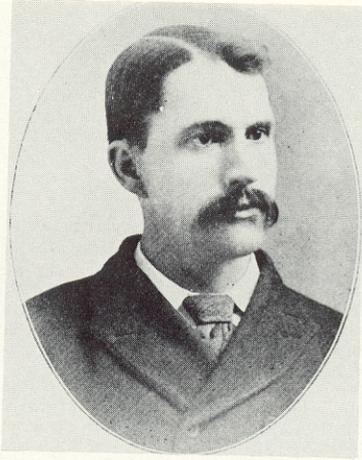


The six-mile diversion ditch above Aitkin on the Mississippi River shortens the river channel by twenty-six miles, partially alleviating the perennial flood problems at Aitkin.

areas fought for economic control of this northern Minnesota hinterland. It is clear that the Corps of Engineers was caught between two political factions struggling for domination of more than water resource development. Both the district office and the board of engineers favored keeping the balance of power held by the Twin Cities. What the Duluth businessmen could have done to counter this bias was to ask that the management of the reservoir system be transferred to the Duluth office of the Corps of Engineers. This action would not necessarily have changed management policies, but it would have transferred the center of decision making from Minneapolis and St. Paul to Duluth. This move would have aided the ambition of Duluth boosters who wanted to make their city the hub of a commercial, educational, medical, recreational, religious and governmental complex serving upper Wisconsin, Minnesota and the Dakotas, as well as Canada.⁵⁶ Within five years iron ore development in this region would help them to accomplish part of this goal. Lumbering had its center in Minneapolis; the red earth industry would focus its shipping operations in Duluth, and in fact, Major Francis Shunk noted in 1908, the mining interests would block any enlargement of the reservoir system.⁵⁷

Aitkin Diversion Cutoff

An important sequel to the 1905 flood controversy was the request for a diversion channel around Aitkin. In May, 1906, General Mackenzie accepted an adverse recommendation of the district engineer and the board of engineers, against constructing the Aitkin cutoff. Major Derby had concluded that the cost was too great and the construction would not benefit navigation.⁵⁸



George A. Ralph, state drainage engineer for Minnesota, proposed to eliminate flood conditions at Aitkin by constructing a cutoff ditch which he estimated would cost about one-tenth the amount calculated by the Corps of Engineers.

A year later George A. Ralph, the Minnesota state drainage engineer, who had built over two million dollars' worth of ditches across northern Minnesota, studied the cutoff problem at Aitkin. He concluded, according to the *Pioneer Press*, May 13, 1907, that a ditch twelve feet deep, fifty feet wide and six miles long would only cost \$150,000 to build. He proposed to finance this venture by taxing adjoining lands up to one dollar an acre.

Aitkin residents were not impressed. The *Aitkin Independent* reported on May 20, 1907, that landowners were opposed to going into debt for the improvement, that they doubted the feasibility of its construction, and they questioned the state's capacity for managing the project. C. E. Harris opposed the ditch unless the federal government did the work. T. R. Foley felt that Uncle Sam should not only build it, but pay for it as well. On June 8 in the *Independent*, C. H. Warner questioned Ralph's engineering capabilities and recalled that the army engineers had estimated the cost at \$1,500,000. Even \$150,000 of local money seemed too much for an experimental project. Thus, the diversion channel idea was dropped for another thirty-five years. This decision was unchallenged during a period of relatively dry years.

During the 1940s, however, the flood plain around Aitkin was again turned into a summer lake. Major floods occurred in 1941, 1943, 1944, 1945 and 1948. By this time Congress had authorized the Corps to consider flood control as one of its responsibilities. Plans for a six-mile diversion channel were only two percent complete in 1950 when the highest flood on record hit Aitkin.⁵⁹ On May 20 the Mississippi crested at 19.49 feet. Floods in the next three years did not seem to rush the development of plans and specifications. Finally, in 1953 contracts were let on a \$1,680,000 canal project. The cost was not far from the estimate of fifty years earlier!

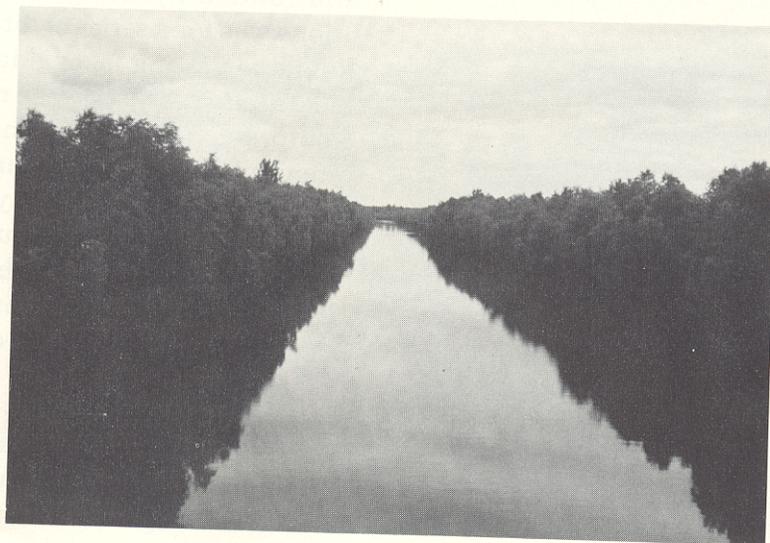
Perhaps as a result of previous interactions between the Corps and area residents, an Aitkin County Flood Control Association was formed to take over full responsibility for managing the channel after construction. The procedure was in accordance with guidelines of the 1936 Flood Control Act. The Association agreed that it would "a) provide without cost to the United States all lands, easements, and right-of-way necessary for the construction of the project; b) hold and save the United

The area around Aitkin is a very flat portion of the upper Mississippi watershed and flooding is a way of life for residents who have chosen to live in that section of northern Minnesota. This photo was taken in 1945.



States free from damages due to the construction works; c) bear the expense of all necessary alterations of utilities, roads, highways and bridges; d) maintain all works after completion in accordance with regulations prescribed by the Secretary of War; and e) prevent future encroachments in the flood plain of the Mississippi River within the limits of the project.”⁶⁰

The project was completed and on December 24, 1956, the responsibility for maintenance of the diversion channel and its connecting cutoffs was turned over to local officials. It has been estimated that during the succeeding twenty years the project prevented \$3,131,000 in flood damages.⁶¹



The Aitkin diversion channel was finally completed in 1956. This photo, taken in 1976, shows a portion of the channel looking westward.

Connecting Canals, Bridges, and Locks

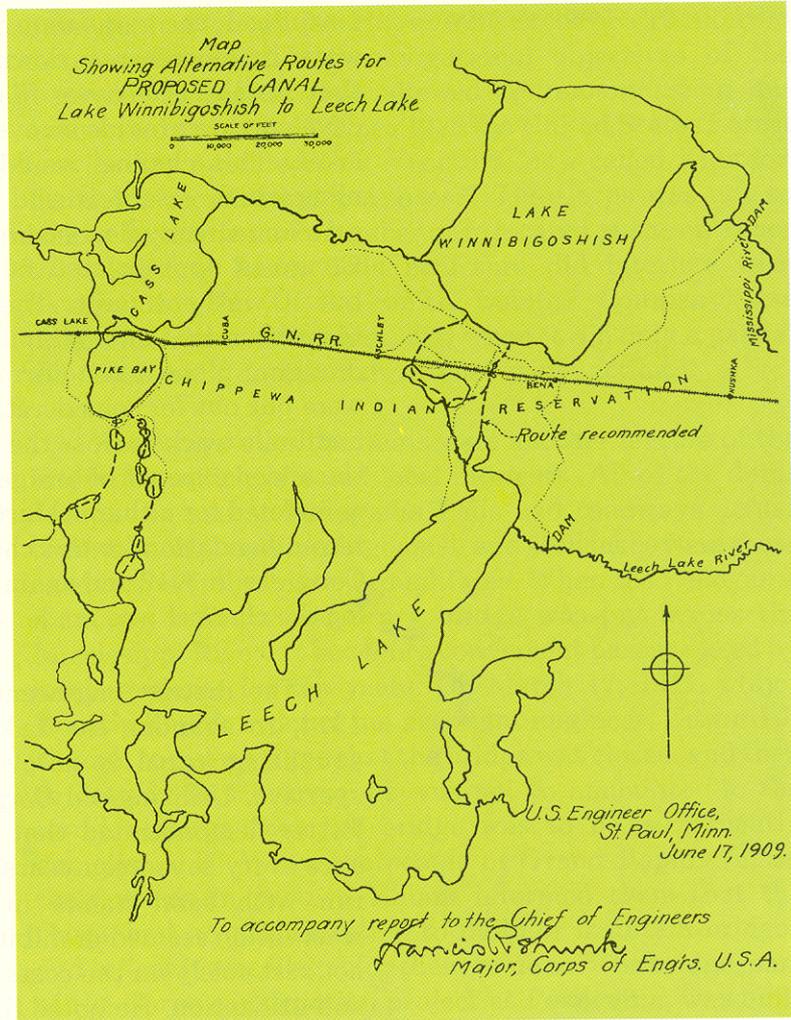
Another example of local attempts to modify Corps policy within the headwaters area concerns the efforts to improve small craft navigation between the reservoirs and adjoining lakes. In June of 1899 C. E. Seebye, L. H. Brown, A. J. Stansfield and others asked for locks in all the reservoir dams. They proposed that the eight steamers on Leech Lake and the lumbering boats on Cass Lake should have free movement on the 330 miles of navigable waterways in northern Minnesota.⁶² Archibald Johnson, the civilian assistant engineer in charge of replacing the timber dams, directed the petitioners to their congressman.⁶³

The dams had never been provided with locks, except at Sandy Lake. The original timber dam there had a lock which was well utilized, for the Sandy Lake outlet to the Mississippi River had been a busy waterway for many years. When a concrete structure was planned to replace the timber dam, the cost came to \$75,000 and a lock was omitted to save an additional \$50,000.⁶⁴ However, vigorous protests by local residents supported by the St. Paul office persuaded Congress in 1908 to add funds for a lock to the original appropriation.⁶⁵ (This lock was converted to a spillway in 1958.) The agitation for locks in other dams was ignored in 1914 when Lieutenant Colonel Charles L. Potter told Congress that they were not worthy of consideration.⁶⁶

Lieutenant Colonel Potter, reflecting the conservative attitude of the Corps prior to World War I, also objected to two other projects which had previously been approved and funded by Congress. The first of these appropriations was for a series of ditches connecting Gull Lake with Round and Long lakes. Many of the residents in the Gull Lake area gave up flowage rights and supported the federal dam promoted by William de la Barre because they were promised connecting channels between these lakes. However, as lake shore property increased in value, the original appropriation was inadequate to acquire the right of way and Potter recommended that the whole idea be abandoned. His rationale was based simply on the lack of commercial navigation. Congress killed the project in 1916.⁶⁷

The largest project abrogated during Lieutenant Colonel Potter's tenure as district officer was the Lake Winnibigoshish-Leach Lake "equalizing channel,"⁶⁸ When Lake Winnibigoshish came close to full capacity in the

The Winnibigoshish-Leech Lake equalizing channel was proposed to help eliminate high water problems and shore erosion on Lake Winnibigoshish. The project was abandoned in 1914 after an economic feasibility study.



This picture shows the lock at Sandy Lake dam in 1955, before the Corps rendered the lock gates inoperable in 1958.

1905 flood, the gates were opened, causing continued high water in flooded areas downstream. However, it was noted that Leech Lake never filled to its capacity. A plan was developed to provide an overflow channel between the two lakes. This channel would relieve flooding on the Winnibigoshish reservoir and reduce the need for releasing water on already flooded areas at Grand Rapids and Aitkin. Congress appropriated \$61,200 for the canal in 1910,⁶⁹ but it was not built. The lack of rainfall in 1911 kept the water in Lake Winnibigoshish too low to float the dredging plant and no firm would bid when the contracts were put out for consideration. In the meantime, railroads had built tracks across the proposed canal route. To avoid the added expense of bridges at this site, a new survey was completed for a channel farther to the west.⁷⁰ Although the recommendation for this change in plans was submitted to Congress in 1912 and again in 1913 no other appropriation for the channel was made.

The district engineer's recommendation on June 4, 1914, to abandon the Lake Winnibigoshish-Leech Lake equalizing canal is noteworthy for its long-range perspective. Utilizing old Corps records, Lieutenant Colonel Potter demonstrated that the canal would be used only once every seventeen years. The cost of maintaining a dry run with sand banks in a swampy, isolated Indian reservation seemed prohibitive. But Potter's argument did not rest solely on the costs during sixteen-year periods of non-utilization. He noted that when the channel was used, it would give only minimal relief to industry and summer resorts on Winnibigoshish and Cass lakes, and, it would cause great hardship to the Chippewa Indian population on Leech Lake. By flooding wild rice beds and hay meadows around Leech Lake, the equalizing canal would not provide equitable benefits for the "unprovident Indian."⁷¹ Congress, heeding Potter's advice, withdrew the appropriation on March 4, 1914.⁷²

In the meantime, the citizens of Cass Lake provided their own solution for regulating the water level above the Winnibigoshish dam. They built a dam between Cass Lake and Lake Winnibigoshish which ironically caused flooding during periods of heavy run-off. Residents, however, blamed the high water on the federal dam at Lake Winnibigoshish.⁷³ The district engineer pointed out on numerous occasions that the structure at the outlet of Cass Lake was illegal and that the owners were liable for any

damages it might cause. But as long as the obstruction did not interfere with the navigational objectives of the reservoir system it was allowed to remain as an unauthorized structure.⁷⁴ Since 1928 the United States Forest Service has operated this structure, now called Knutson Dam, for recreational purposes.⁷⁵ The Corps was not so lenient in the case of a lumber dam located at the entrance to Pokegama Lake. This structure did interfere with navigation. The C. A. Smith Lumber Company was ordered to remove the dam, and when it did only a partial job the district engineer threatened court action.⁷⁶

Roadways over the dams were another feature of the reservoirs which affected local interests. All of the dams except the one at Pokegama Falls had roadways across them but only at Winnibigoshish and Gull lakes were these roads joined to public thoroughfares. When the Pokegama dam was built, a temporary bridge was put across the Mississippi River. It became a convenient passage used by local residents for ten years. On March 17, 1911, Major Francis Shunk ordered his assistant engineer, Edward J. Dugan, to put up signs that the bridge was closed, and then to destroy it. However, he was not to announce "to the world at large that the bridge was to be permanently demolished."⁷⁷ When the people of Grand Rapids raised their voices in protest, Shunk informed them that the Corps had no authorization to build or maintain bridges and in fact it was illegal for them to do so. The bridge, part of the Corps construction project at Pokegama, was built of second-hand materials. Shunk considered it a "nuisance." To his knowledge it was of no further use to any vehicle belonging to the United States government.⁷⁸

These incidents are clear evidence that in the periods after the 1905 controversy the Corps continued to define its obligations in terms of navigation alone. In the matters of the Aitkin diversion, connecting channels, locks, bridges and private dams the Corps did not attempt to satisfy the broader water development aspirations of local residents.

Dredging and Logging

Between 1905 and 1929, the major construction activity of the Corps on the Mississippi River above the Falls of St. Anthony consisted of dredging and clearing the channel between Brainerd and Grand Rapids, and straightening the Leech and Mississippi rivers between the upper



This 1880 log sluice in a northern Minnesota dam allowed a large enough volume of water to escape to carry logs downriver to the next logging dam.

reservoirs and the Pokegama dam. This work was done, naturally, to aid navigation on the upper Mississippi; however, its major navigational use was the sluicing of logs from the reservoirs behind the Leech Lake, Winnibigoshish and Pine River dams.⁷⁹

It should be of no surprise that the reservoir system aided the logging interests, for by 1876 lumbermen controlled most streams and rivers in the upper Mississippi watershed through a network of private dams and booms. The devastating triumph of ax and saw is a well-known chronicle of man's greed and shortsightedness. Some thirty years later, in 1905, over two billion feet of lumber were processed in the state of Minnesota. That is enough boards, shingles, laths, doors, barrels and two-by-fours to fill 240,000 freight cars! Put another way, in one single year the lumber industry processed enough wood to form a solid plank road fifteen feet wide stretching all the way around the world—25,000 miles.⁸⁰ During that peak year of 1905, 491 million feet of logs were floated out of the reservoir area to the big log booms at Brainerd.

The work of the Corps on the Mississippi between Brainerd and Grand Rapids paralleled the rise and fall of the lumber industry.⁸¹ In 1881 the Corps dredged 274 cubic yards of clay and 194 yards of boulders, cleared 1,780 snags, and pulled out 15,202 leaning trees so lumber crews could bring in supplies to their camps. In 1886 and 1887 the district engineer, Major Charles J. Allen, reported that the numerous lumber company dams were the major cause of spring floods and low water in the summer, and asked for permission to regulate them. Although he recommended that the lumber industry be limited to using the river for only forty days after August 1, no regulations were issued by the federal government until after the last large log drive in 1915.⁸² By 1925 the Corps had abandoned all improvements, for the lumber industry was no longer floating logs.

Instead of regulatory codes, the Corps provided free services and capital improvements. New concrete dams were built with sluiceways; dam tenders opened them to accommodate lumbermen whenever they needed water to float logs downstream. After 1901 the Mississippi River between Brainerd and Grand Rapids became a separate navigation project distinct from the operation of the reservoirs and funds were appropriated to keep the 181 miles of channel clear—clear of everything but logs.

During the controversy of 1905 few citizens complained about the lumber industry. Self-interest was an obvious factor, for most residents of the area, including farmers, worked part of the year in the employ of lumber companies.⁸³ After 1905, however, complaints about logs obstructing navigation came to the district engineer's office more frequently. The lumber companies became villains because their established methods of logging wasted stored water, jammed the river channel, disrupted river usage, caused periodic floods and often left the river full of sunken logs and other debris. Summer residents became concerned with the rights of small boat-owners. Major Francis Shunk summarized the attitude of the St. Paul office in 1909 when he reported to the chief of engineers that "the movement of logs . . . is the most important form of navigation on this part of the river." It was his opinion that no regulations could be devised "which will permit the use of the river to the satisfaction of [both] loggers and boatmen."⁸⁴

A year later, however, Major Shunk was forced to call a public hearing to consider regulations governing the sluicing and running of logs.⁸⁵ The lumbermen prevailed, though it was evident that their power was declining. In 1915 Lieutenant Colonel Potter saw no need for any further regulations or public meetings. Glenn E. Judy of Federal Dam, a local resident who opposed the notion that lumbermen owned the river, wrote to Potter proposing that the Corps release water for sluicing logs only in small quantities. Potter advised Judy to "be patient," "suffer inconvenience" and "live and let live." In Potter's view "the days of the large log drives are over," and he observed, "We, here in this office, have a much broader view of the whole situation."⁸⁶ In spite of Potter's report to the chief of engineers that it was impossible to regulate logging without causing great economic distress for the lumber industry, the secretary of war did issue regulations in May, 1915.⁸⁷ Two months later, Major Ernest Peek, Potter's replacement, filed a formal complaint against T. J. Welsh of Bemidji because logs had jammed the channel above Deer River. It was the government inspection boat, the "Animiki," with Peek on board which had been blocked from proceeding to the Winnibigoshish dam!⁸⁸

The Northwest Paper Company caused another major problem by dumping bark refuse into the Mississippi. The bark formed "several very bad bars" causing snags and "choking the stream." Major Shunk called the problem an "unmixed evil" and ordered the paper company to dump its bark elsewhere, citing the Refuse Act, Section 13 of the Rivers and Harbors bill of March 3, 1899.⁸⁹

Government engineers, local steamboat owners and private citizens were not the only river users frustrated by the lumber industry's proprietary attitude toward the river. Power companies located on the river also challenged the cavalier actions of lumbermen. In 1908 a controversy arose between power and lumber interests when the Mississippi River Boom Company permitted log jams to form below the power dam at Little Falls, reducing by several feet the effective head of water. The Little Falls Waterpower Company retaliated by closing sluice gates in its dam, preventing more logs from going downstream.⁹⁰ The lumbermen complained to the Department of War and Major Shunk was ordered to investigate. He found that the logs were caught against the piers of a Northern Pacific Railway bridge below the dam and the bridge was an unauthorized structure. The boom company, however,

would not make a formal complaint against the railroad, in part because the obstruction “materially assisted” its operations. It was an interesting problem for the district engineer, because he was authorized to regulate navigation. The major commercial navigation in this section of the river was logging—and the unauthorized railroad obstruction actually aided navigation!⁹¹

Major Shunk recommended to the secretary of war that the Northern Pacific Railway be required to put in booms above its piers to prevent log jams. No action was taken on this request by the secretary. When the Little Falls Waterpower Company sent in an identical complaint the following spring, Shunk advised the company to take the boom company and the railroad to court to settle the issue.⁹²

Although logging declined in the early 1900s, the steamboat traffic on the Brainerd to Grand Rapids stretch of the river continued. In spite of the heavy traffic in logs in 1905, two steamboats operating on that part of the Mississippi carried 2,840 passengers and 660 tons of freight.⁹³ Five steamboats operated there during 1906, carrying 5,550 passengers and 11,900 tons of freight.⁹⁴ In 1916 the steamer “Lee” was still operating but only carried 400 passengers.⁹⁵ Between fifty and sixty-five commercial and pleasure launches also operated on the river above Grand Rapids before World War I.⁹⁶ During World War I all river traffic was sharply curtailed. In the 1920s improved roads and the internal combustion engine offered preferable ways of travel and transport.

The Corps gradually phased out its work on this stretch of the river after World War I. It had two dredges,

The dredge “Oriole” was utilized by the Corps of Engineers to keep the Mississippi River channel clear between Grand Rapids and Brainerd during the decline of logging in northern Minnesota. The sixty-ton “Oriole” was abandoned in 1920.



TABLE 5 COMMERCE ON THE UPPER MISSISSIPPI
BETWEEN GRAND RAPIDS AND BRAINERD
1904-1925

Year	Tonnage	Steam-boats	Passengers	Year	Tonnage	Steam-boats	Passengers
1904	1,715,000	1	1,300	1915	366,700	1	1,000
1905	367,500	2	2,840	1916	87,100	1	800
1906	1,435,000	5	5,550	1917	240,000	1	400
1907	1,055,000	2	4,000	1918	15,000	1	75
1908	1,150,000	3	1,700	1919	4,505	1	—
1909	1,225,000	3	2,200	1920	4,950	1	—
1910	785,000	3	1,500	1921	24,146	—	—
1911	675,000	3	1,050	1922	33,150	—	—
1912	605,950	3	1,400	1923	1,719	—	—
1913	466,255	1	700	1924	10,725	—	—
1914	424,600	1	800	1925	11,415	—	—

From: Office of the Chief of Engineers
from *Annual Reports*

TABLE 6 COMMERCE ON THE UPPER MISSISSIPPI
BETWEEN LEACH LAKE AND POKEGAMA
1912-1926

Year	Tonnage	Steam-boats	Passengers	Year	Tonnage	Steam-boats	Passengers
1912	306,150	3	no data	1920	14,235	—	—
1913	240,250	2	no data	1921	36,597	—	—
1914	386,225	2	no data	1922	1,147	—	—
1915	238,000	3	6,730	1923	18,980	—	—
1916	186,120	2	3,100	1924	2,530	—	—
1917	37,000	2	1,000	1925	1,029	—	—
1918	73,286	—	1,000	1926	366	—	—
1919	29,800	—	3,000			—	—

From: Office of the Chief of Engineers
Summary from *Annual Reports*

the "Manito" and the "Oriole," in operation between 1913 and 1929. The "Oriole," a 107-foot, 60-ton snag boat, was abandoned in 1920 with eighty-four percent of the Brainerd to Grand Rapids project complete.⁹⁷ The "Manito," converted into a large dredge, continued to work on the Leech River below the Leech Lake dam and the Mississippi between Pokegama Falls and Lake Winnibigoshish. Crews of the "Manito" shortened this crooked stretch of water from one hundred miles to under fifty miles by digging cutoffs during the 1920s.⁹⁸ This continuing work on the river was justified for its aid to small boat navigation, and because it decreased the distance water discharged had to flow to the Mississippi from the two big reservoirs above Grand Rapids. The "Manito" project was completed in 1926 and the dredge was sold in 1929 after three years of inactivity.

Flowage Rights

A major factor in the century-long controversy over the reservoir project was the government's policy of purchasing flowage rights. Time and energy to carry out this policy were not lacking, for up to World War I more paper work was devoted to flowage rights than to any other activity in the district office.⁹⁹ The process of locating every owner of each square foot of 296,342 acres and obtaining revisions in the deed to each parcel that might be damaged by reservoir operation began in 1882 and was not finally completed until 1936. At one point Lieutenant Colonel Potter became so frustrated over obtaining rights to an isolated acre on the south side of Gull River that he offered to purchase it himself in order to avoid "a nasty legal fight."¹⁰⁰ But working through a maze of assessments, liens, judgments, mortgages, court decisions, taxes, trusts and land contracts of property-owners, both living and dead, was not the major problem. The big headache was that the property-owners refused to take seriously the government's right to control overflow lands on which engineers had previously acquired flowage easements.

The problems of flowage rights did not lessen as time went on, but multiplied as land in northern Minnesota became more valuable. Agricultural and recreation property were subjects of the majority of complaints. The former consisted mostly of hay meadows along the Mississippi downstream from the big reservoirs. In late summer, just when the hay was ready for cutting, the reservoir gates would be opened to provide water downstream for mills at Minneapolis and for navigational needs below St. Paul.¹⁰¹ Complaints ceased after completion of the nine-foot channel of the Mississippi in the late 1930s.

Owners of recreational lake shore property on the reservoirs have been much more vocal than farmers, although their financial losses caused by fluctuating reservoir levels have not been as great. This group of land owners has had more influence with Congress, however, and has been successful in securing minimum and maximum water levels for reservoirs more favorable to them.¹⁰² The Corps' original flowage rights have in fact been significantly limited.



This 1905 photograph of a lake in the headwaters region indicates the impact of varying water levels on flowage lands. Along the Mississippi River such property became prime acreage for raising hay, even though the federal government had purchased the right to flood it during periods of reservoir discharge.

Dam Tenders

Flowage rights, problems concerning recreational use of the reservoirs, excessive water fluctuation due to strong winds or sudden storms are situations which residents of the reservoir area expect the Corps to handle. The first to learn of any reservoir-related problems are the resident dam tenders. This group of local Corps personnel have had to wear many hats and possess rather thick skulls during their tenure in the headwaters region.

Dam tenders were provided government living quarters adjoining each of the six reservoir dams. Most of the original buildings, with some modifications, are still being used. During the early part of the twentieth century these residences were isolated outposts, accessible by team

and wagon only when the roads were passable. The Lake Winnibigoshish post was considered the most primitive, while the one at Pokegama Falls in the eyes of Major Francis Shunk was the "most civilized."¹⁰³ The Pokegama dam tender's residence included two bedrooms, a bathroom, a sitting room, a hot-air furnace and hot and cold running water. A separate office was available for district staff at each dam site. Dam tenders were obliged to furnish board for visitors from district headquarters at thirty-five cents (a meal). The board was said to be "very satisfactory" except at Lake Winnibigoshish, where only bare sustenance could be expected.

Without adequate roads, most of the travel between reservoirs was done by railroad before World War I. To tour all six reservoirs meant using the Great Northern, the Soo Line, the Northern Pacific and the Minnesota and International Railroads to the station nearest the site and then driving the rest of the way. Site visits usually took six or seven days, depending on the condition of the wagon roads.¹⁰⁴ According to Major Shunk, the trail from the railroad station at McGregor to the Sandy Lake dam was "one of the worst in the world."¹⁰⁵ Sometimes the roads were blocked by snow or soggy with mud. At times other problems interrupted communication with the St. Paul office before telephone service, and later "wireless," provided more reliable connections between the dam sites and the district engineer.

Although it was the duty of the dam tender to guard government property, this was a very large responsibility for one man. For example, in July, 1898, unknown persons cut a ditch five feet deep, two feet wide, and sixty feet long in the bank of the Pine River reservoir. Major Frederic Abbot asked the chief of engineers' office for a detective to help the dam tender locate the saboteurs, but the chief thought the price of ten dollars a day was prohibitive!¹⁰⁶

On the average, the first two generations of dam tenders worked less than eight hours a day. They took daily readings of the reservoir levels, received and answered a communication about once every six weeks from Chief Clerk John Wade at the St. Paul office and thus, they became accomplished hunters and fishermen. They were responsible only for the operation of the dams. Construction and maintenance were handled by a civilian assistant engineer based in St. Paul. After 1958, the



Bishop Henry B. Whipple, named "Straight Tongue" by Minnesota Indians, attempted to get the Chippewa adequate reimbursement for the land acquired by the federal government to construct the reservoirs in northern Minnesota. Compensation was the responsibility of the Department of the Interior.

tenders became involved in the growing recreational services of the Corps and their work schedules and responsibilities were greatly expanded.

Through the years dam tenders have shouldered the majority of complaints about local Corps activities. Sometimes, as in 1909, they succumbed to the temptation to answer back. A. B. Chapin, a patriotic resident of Aitkin County, was convinced that all government employees were "a gang of socialists." He wrote letters to his congressmen about the subversive activities of "road commissioners, mail carriers, school boards, town councils, and state officials." He was especially concerned about the construction of a government telephone line to the Sandy Lake damsite which seemed to meander through the woods. With tongue-in-cheek, George Snetsinger, the dam tender, explained to Chapin that the contract allowed six weeks for building the communication system, so the "socialistic crew" took up the excess time and materials by making "a few turns about the country." Actually, the telephone line was built along the original road which followed the natural contour of the land. After Chapin's complaints were passed on to Major Shunk by the chief of engineers, the district engineer then had to explain to Representative Frederick C. Stevens that Mr. Chapin was "malicious, mendacious, and of unsound mind."¹⁰⁷ Shunk's report did not allude to the north woods wit of the Sandy Lake dam tender.

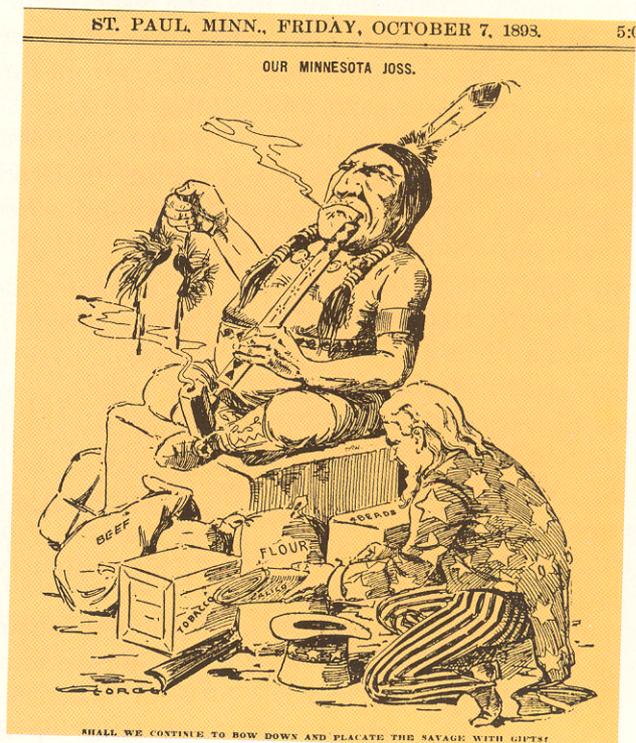
Indians

The first reservoir construction on the upper Mississippi began in the winter of 1881-82 on land within the Leech Lake Indian reservation. Because the bids of private contractors were too high, the Corps itself decided to do the work. Work had barely begun when the United States attorney general's office shut down the project. The Chippewa Indians had appealed to the Department of the Interior for a clarification of their property rights. It was evident to those working on the dam sites that the Indians were not happy with the presence of the military on land allotted to them by treaty.¹⁰⁸ A commission appointed by the Interior Department awarded the Chippewa \$15,493.90 in damages, and construction was allowed to continue, although the larger problem of flowage rights was left unresolved.¹⁰⁹

For many years Protestant Episcopal Bishop Henry B. Whipple of Minnesota, through speeches and writing,

had championed Indian rights. In 1886 he called attention to "Our National Dishonor" of injustices to Indian peoples. He spoke in particular of the lack of compensation in the building of government dams and the flooding of Chippewa lands on Leech and Winnibigoshish lakes. Bishop Whipple, whom the Indians respectfully called "straight tongue," was able to prod Congress into passing legislation of benefit to these Minnesota Indians on January 14, 1889, and August 19, 1890.¹¹⁰ As a result, some Chippewa families were removed to reservations at Red Lake and White Earth from their lands on Leech and Winnibigoshish lakes and flowage rights were purchased on other Indian property. A lump sum of \$150,000 was to be distributed by the Interior Department to the Indians as compensation for their removal.¹¹¹ The allocation of this money remained a sore point with the Corps in the continuing controversy with north woods Indian tribes. Many district engineers complained that they were not allowed to control or monitor its distribution. As late as 1913 Lieutenant Colonel Charles Potter called the whole Leech and Winnibigoshish matter a "jughanded affair."¹¹²

Lack of co-ordination between federal departments over Indian rights actually caused a short "war" in the 1890s. An underlying problem concerned the rights of Indians to sell reservation timber on flowage lands around



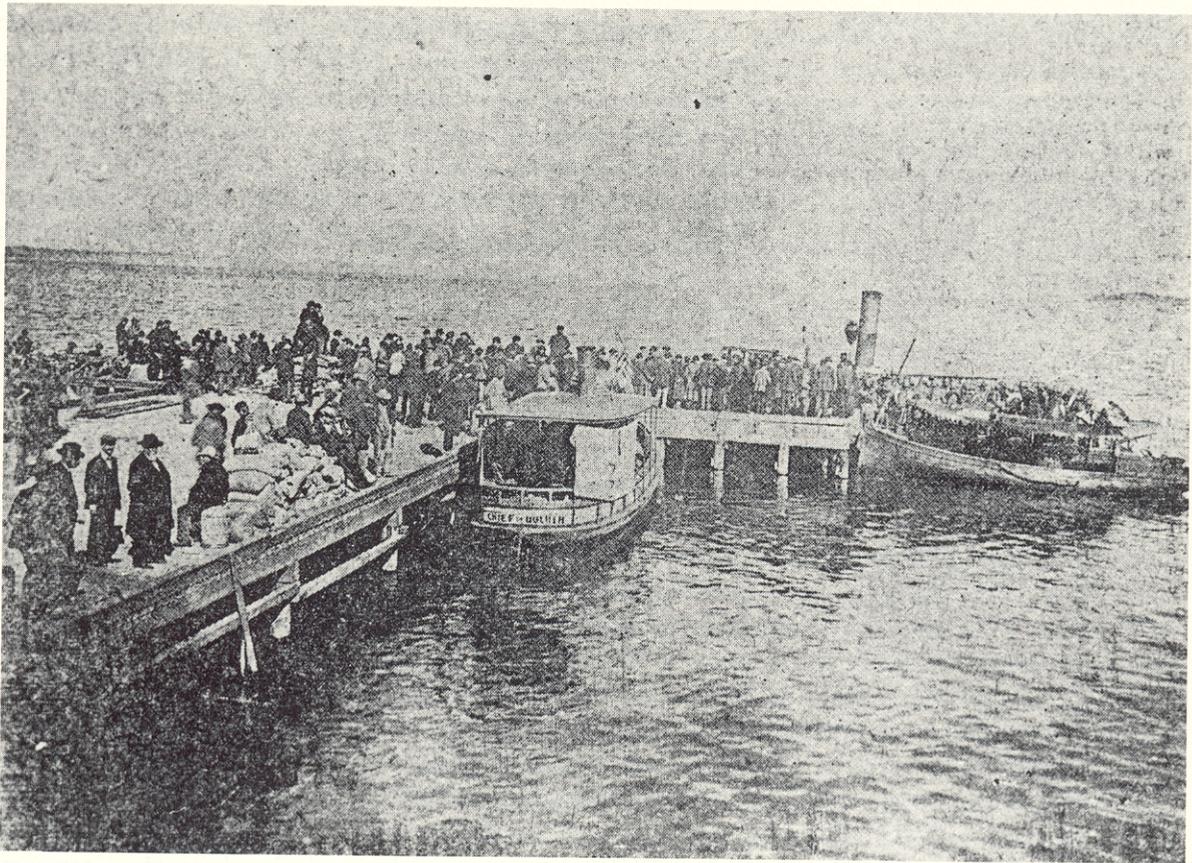
This cartoon appeared in the *St. Paul Dispatch* on October 7, 1893, after the "Battle of Sugar Point," showing the attitudes of the Minnesota press towards the Indians.

the reservoirs. The legislation of January 14, 1889, did not provide for the transfer of flowage rights! Thus additional legislation was necessary to insure that there were adequate funds to cover the cession costs, surveys, and appraisal fees for purchasing these rights. Confusion over boundaries and the continuing question of whether such groups as the White Oak Point Indians had been given their full share of the \$150,000 compensation roused the ire of the local tribes.

This last Indian uprising began with the arrest of Chief Bug-o-nay-ge-shig on September 15, 1898.¹¹³ The leader of this Pillager band of Leech Lake Chippewa Indians escaped from United States marshals and went into hiding. Ten days later Bug-o-nay-ge-shig and other Pillager chiefs sent a petition to the "Great Father" asking for a "searching investigation" of the wanton methods of white speculators who set fire to reservation pine in order to purchase at greatly reduced prices the "dead and down timber." The Chippewa Indians were especially concerned about the practice of using tribal funds to pay the extraordinary salaries of six government appraisers who supervised the sale and cutting of Indian timber. Local citizens, such as Gus Beaulier, had revealed to the Indians how these officials were underestimating the true value of the reservation's main source of income. In response to this threat to government authority, the marshals requested troops from Fort Snelling to assist in the capture of Chief Bug-o-nay-ge-shig. On September 30, twenty men of the Third Regiment United States Infantry under the command of Brigadier General John M. Bacon left Fort Snelling for Leech Lake.

Meanwhile, back at the Corps office, district engineer Major Frederic Abbot heard rumors that the Indians planned to retaliate to this show of force by destroying one of the government dams. Abbot sent rifles and ammunition to the dam tender at Pokegama Falls and requested the army to send a squad of troops to Leech Lake "to protect Government property and Dam Tenders."¹¹⁴ As a result of Abbot's request, eighty additional men of the Third Infantry left Fort Snelling on October 4.

The ensuing confrontation has been called "the last Indian uprising in the United States." The "Battle of Sugar Hill" is little known—perhaps because the Indians won. On October 5, 1898, a small squad of soldiers and four



The "Battle of Sugar Point" took place on Leech Lake in 1898. Pictured here are troops under General Bacon's command getting ready to embark for the last battle between federal soldiers and Indians in the nineteenth century.

newspaper reporters boarded the steamers "Flora" and "Chief" and a barge at Walker and set out for Sugar Point in Leech Lake. The troops went ashore on the peninsula opposite Bear Island about eight miles south of the Leech Lake reservoir dam where Chief Bug-o-nay-ge-shig had his house. After arresting one Indian, the squad moved inland to three Indian villages, but found no one to apprehend. About 11:30 the troops returned to the clearing about Bug-o-nay-ge-shig's home and stacked their rifles for dinner. Apparently, one of the Krag-Jorgensen rifles fell to the ground and went off accidentally. This set off a return volley from the Indians hiding in the woods. For three and one-half hours the shooting continued. Most of the soldiers were raw recruits who "scarcely knew how to load and fire their own rifles." One officer, Captain Melville C. Wilkinson, and five privates were killed and ten men were wounded. General Bacon and his men spent an anxious evening on the point while the steamboats returned to Walker for reinforcements. One additional soldier was killed the next morning by the chief's fifteen year old grandson, when the recruit decided to help himself to potatoes in Bug-o-nay-ge-shig's garden.

News of the battle spread quickly through the north woods and the communities of Walker, Bemidji, Farris, Cass Lake, Deer River and Aitkin sent telegrams requesting more troops. It soon became evident that the Indians could have caused a much greater massacre. What they really wanted was immediate action from Washington officials. They got it. Commissioner of Indian Affairs William A. Jones arrived in Walker on October 10 and went with a priest who was trusted by the Indians, Father Aloysius, for a peaceful conference with the chiefs of the Pillager band at Bear Island. Commissioner Jones promised to rectify the timber grievances and the Indians promised to release thirteen of their braves to federal marshals to stand trial in Duluth. Chief Bug-o-nay-ge-shig never was arrested, and local citizens soon requested that troops be withdrawn from their communities, as the raw recruits proved as incapable of handling the bottle, as they were of using a rifle.

During this period the Corps was in the process of tearing down the old wooden dams at Leech and Winnibigoshish lakes and replacing them with concrete structures. H. A. Libby of Minneapolis had a contract to supply wooden piles for the project. He expected to cut the timber on Indian lands and requested permission from the Corps and the Department of the Interior to do so.¹¹⁵ Major Abbot, wishing to avoid renewed trouble with the Indians, told Libby that he would not accept any timber from Indian property.¹¹⁶ Libby appealed to the Secretary of War to reverse Abbot's decision, but the district engineer prevailed. Abbot set forth clear guidelines for relationships between Corps personnel, contractors, laborers and local Indians. He said, in general, "the less we interfere with the indians (sic) the better for all parties."¹¹⁷

Despite these efforts to avoid controversy, logging operations on Indian land continued to be a problem for the Corps office. In 1898 there were over twenty-five logging camps on Leech Lake and its tributary streams. In 1909 the Department of the Interior requested the lowering of the Leech Lake reservoir every winter for three successive years to make easier the cutting of timber on flooded lands. Major Shunk refused the request. He suggested instead that the trees be cut after the water had frozen.¹¹⁸

Individual conflicts between Indians and dam tenders also caused problems. For example, when the Chippewa

Indian Long-ah-coming claimed that his house was burned by construction men, Major Abbot was quick to pay the damage, in spite of the fact that Abbot learned that the house had been built by Corps personnel on federal land as a construction shed.¹¹⁹ Fishing, ricing and hunting activities by both Indians and white sportsmen have continued to be a source of controversy in this area.

A continuing problem involving the Corps of Engineers, the Bureau of Indian Affairs and local Indian tribes has been the fluctuation of Leech Lake water levels. The Indians in the headwaters area harvest over seventy per cent of the wild rice grown in the United States.¹²⁰ Wild rice, along with hay from the meadows, forms a major part of the economic support for Native Americans around Leech Lake. Dry years are good for the hay crop, but do not provide necessary water for growing the wild rice. Excessive moisture in wet years destroys both. The monitoring of lake levels is thus an important matter, and gauges have been installed at many outlying points to help in the maintenance of a consistent water level. By the release of water at appropriate times in 1949 and 1956, the Indians were enabled to harvest bumper rice crops.¹²¹ But in 1957, when a large section of the Leech Lake dam failed during a reconstruction project, the whole crop was ruined

Ricing in the Leech Lake region has been an important economic resource for many generations of Native Americans. Over seventy per cent of the wild rice grown in the United States comes from this locale. Steady water levels are crucial for its cultivation.





Pictured here is an engineering crew gauging the flow of water in September, 1896, above the mouth of the Crow Wing River. Gauging was the major source of the data upon which Corps engineers based recommendations for river improvements.

for lack of water.¹²² Over the past seventy-five years, however, one must conclude that the management of lake levels by the Corps had aided the business interests of the Leech Lake Indians.

Water Management and Recreation

After the demise of logging in northern Minnesota the Corps curtailed its maintenance of the Mississippi River above Minneapolis and St. Paul. The regulation of the reservoir system, however, continued to be of critical importance to citizens of the Twin Cities. The Mississippi was the major source of water for industry, waste disposal and private consumption. The Corps regulations for reservoir water management adopted in 1908 were based on readings of the river gauge at St. Paul. During a normal fall and winter an average of thirty-nine billion cubic feet was released from the reservoirs.

An extremely dry year, such as 1910, proved the value of the reservoir system even though the six dams only controlled about eleven percent of the total watershed above St. Paul. A flow of 6,000 cubic feet per second at St. Paul would maintain a six-foot depth but no more than 3,500 cubic feet per second could be released from Leech and Winnibigoshish lakes without exceeding the flowage rights owned by the federal government on the Mississippi River below Grand Rapids.¹²³ In 1910 the upriver reservoirs were practically the only source of the water going through the Twin Cities and the flow at St. Paul dropped to 3,000 cubic feet per second. In that year rainfall at St. Paul was at an all-time low of 10.21 inches. The seventy-five-year average for that city had been 27.5; the previous minimum had been 15.07 inches in 1852. Without the reservoirs the Mississippi River at St. Paul would have been less than a foot deep.¹²⁴ The channel depth at St. Paul dropped to three and one-half feet in 1910.

Because of the 1910 drought, reservoir management faced a four-year crisis. Although the upper reservoirs normally accumulate an average of forty-five billion cubic feet a year, they added only sixteen billion cubic feet in 1910, while forty-six billion were discharged. The following year was above normal in rainfall, but most of the water soaked into the dry ground. The next year, 1912, was again very dry and the Corps had to restrict discharges in an attempt to store water. When 1913 brought 30.2 inches of rain in the reservoir area, the dry conditions of the soil kept the run-off to only 37.4 billion cubic feet. It was not until 1914 that the system began to operate normally again.¹²⁵

By 1915 the reservoirs were filled to near capacity and lake-shore residents began to complain. Those living on flowage lands above the dams had become accustomed to five years of low water levels. They complained to dam tenders, state representatives, congressmen, the chief of engineers and the St. Paul district office.¹²⁶ In 1915 Gull, Pine and Sandy lake reservoirs were filled over capacity and large quantities of water had to be released. Then complaints of flooding came from residents both above and below these dams. The district engineer decided "to let the two outcries get about even and then hold these conditions." Lieutenant Colonel Charles Potter wrote to the chief of engineers that "there is no altruism in that locality."¹²⁷ Lieutenant Colonel Potter also advised Representative Charles A. Lindbergh not to be influenced by his local constituents, because "many of the complainers

have their horizon limited to 160 acres." Potter went on to explain that reservoir management was not an annual affair because rain does not come "in equal quantities each year." Reservoir management was based on seventy-five year averages, not on annual deviations. Potter wrote, "We do our best not to make one lot suffer while the others are protected."¹²⁸

At times before the nine-foot channel of the Mississippi River from St. Paul to St. Louis was developed in the 1930s, those concerned with water supply asked the Corps to consider expanding the reservoir system. About thirty-six additional sites on Mississippi tributaries were considered. The six with the most potential were those on the upper St. Croix River (with a capacity of 4.69 billion cubic feet), Clam Lake (4.67 billion), Pelican Lake (5.15 billion), Otter Rapids (7.38 billion), the North Fork of the Chippewa River (7.69 billion) and the North Fork of the Flambeau River (5.40 billion).¹²⁹ Because of excessive land acquisition costs, diminishing river traffic and the conservative construction policies of the Corps between 1912 and 1930, no additional reservoirs were ever authorized.

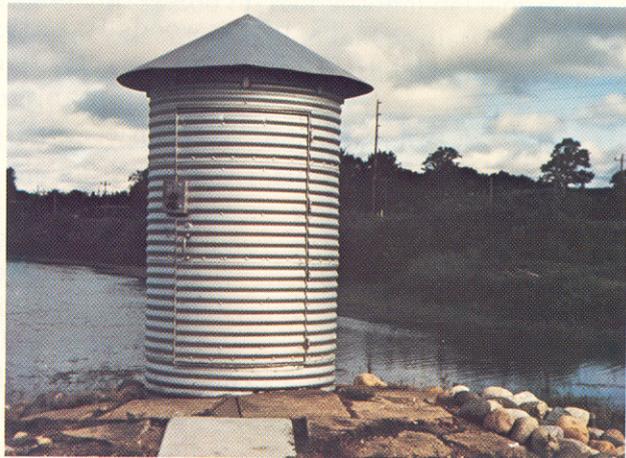
There was nevertheless a gradual change in management policy. This change can be seen in the correspondence of Lieutenant Colonel Potter. Writing to A. C. Whitney of the St. Cloud Water Power Company in 1913, Potter explained that the reservoirs were not developed to serve water power interests, but "to improve navigation and prevent floods."¹³⁰ An 1892 report stating the original purpose of the reservoirs had specified that "control of extended floods or freshets covering long reaches (is) not expected."¹³¹ From time to time the district office admitted that the practice of storing and releasing water was not wholly dependent upon navigational needs.¹³² Potter also noted that the power companies were "incidentally" helped in the winter when the Corps drained the reservoirs for the spring run-off.¹³³ An engineering thesis by A. J. Carlson and Ralph E. Johnston submitted at the University of Minnesota in 1917 argued strongly that the future of the reservoirs would be in water power generation.¹³⁴

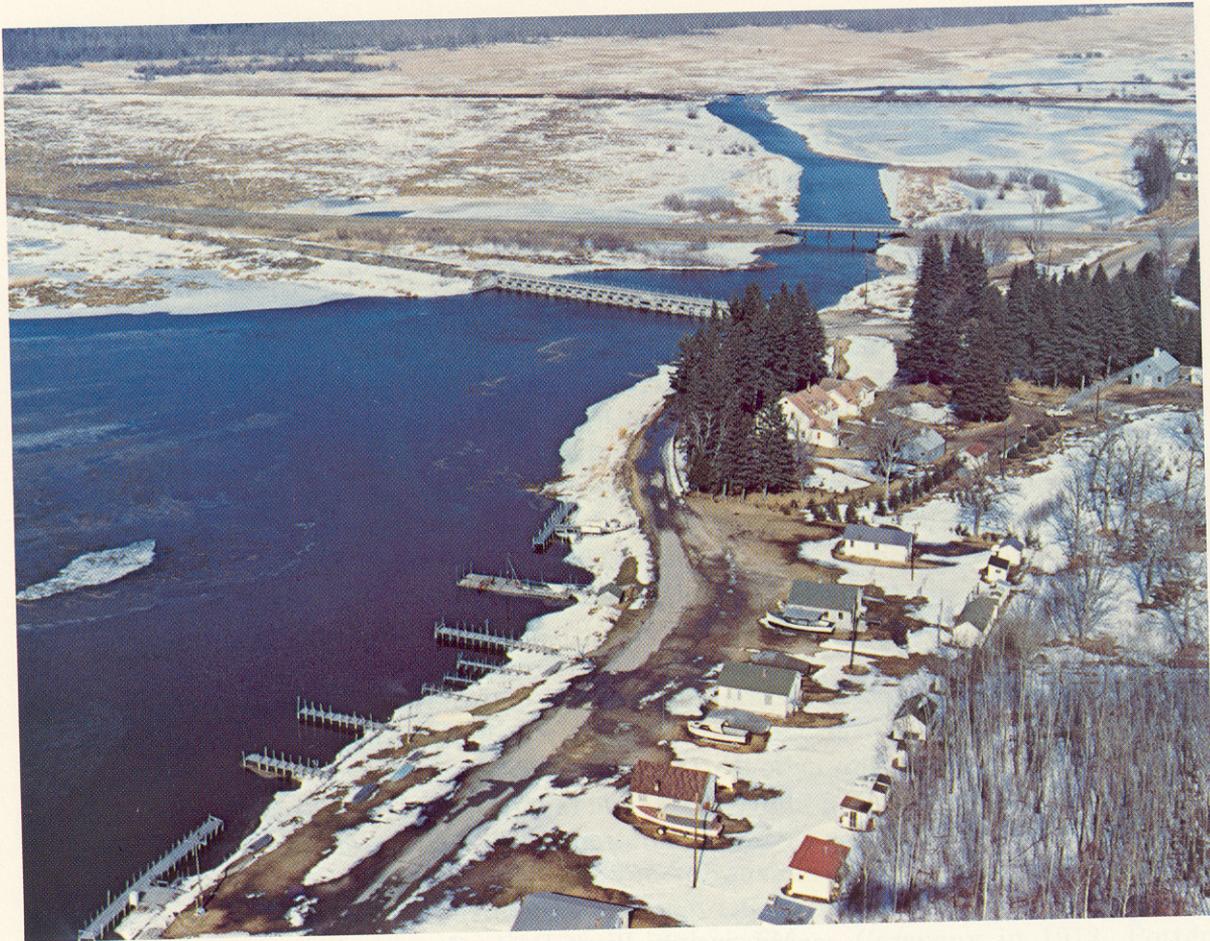
The official shift in policy occurred in 1936, after the locks and dams on the Mississippi below St. Paul were completed. The water level was controlled according to minimum and maximum gauge readings at the headwaters rather than at St. Paul.¹³⁵ The growing number of summer

residents and recreational activities in northern Minnesota by the 1950s brought pressure to keep the reservoirs at a constant level. In fact there was a serious attempt to place the reservoirs wholly under local control. In 1961 an interim committee of the Minnesota state Legislature issued a report which recommended that a state Committee of Conservation be appointed with full authority to release and store water.¹³⁶ By that time, however, it had become evident to many that the reservoirs were only a part of a social and economic environment which included agriculture, industry, fish and wildlife, flood control, navigation, hydrology and sedimentation, power, recreation, and water quality control.¹³⁷ Subsequently, the Corps of Engineers in 1964 established a coordinating committee with representatives from the Departments of the Army, Agriculture, Commerce, Health, Education, and Welfare, the states of Illinois, Indiana, Iowa, Minnesota, Missouri, South Dakota, Wisconsin, and the Federal Power Commission to produce an Upper Mississippi River Comprehensive Basin Study.¹³⁸ Representatives from the states of Illinois, Indiana, Iowa, Minnesota, Missouri, South Dakota, and Wisconsin were included on the committee. Its final report, issued in 1970, set out broad policy recommendations, but did not develop specific detailed plans for any one section such as the reservoir area. It did create another bureaucracy, however: the Upper Mississippi River Basin Commission.

Meanwhile, the Corps of Engineers was active in changing the whole purpose of reservoirs. The storage and discharge of water to regulate river levels became a secondary consideration. The management of public recreational areas became the primary concern of the Corps

This modern water gauge station at Pokegama Falls is one of hundreds maintained by the Corps of Engineers throughout the St. Paul District to record hourly fluctuations in the water levels of rivers and lakes.

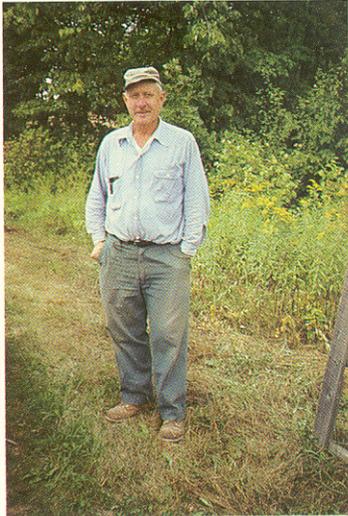




An aerial view of the outlet of Leech Lake taken in 1970 shows the marine facilities that date back to 1909 when the Corps of Engineers first begin to develop public accommodations for fishing, camping, ricing, and boating.

in the reservoir area. What a change! In 1912 the editor of the *St. Paul Pioneer Press* wrote to Lieutenant Colonel Francis Shunk asking him as a frequent visitor to northern Minnesota to write a letter extolling the summer recreational values of the area. Shunk replied rather tersely that he was more impressed with the “flies and mosquitoes” than with the potential pleasures of the north woods!¹³⁹ Little did Shunk realize that fifty years later the major activity of the Corps in the headwaters region would be its management of boating, camping and picnic facilities.

Although the three campground areas and the impressive outdoor accommodations of the Cross Lake Recreational Center at the Pine River dam were in 1977 the most popular of six Corps of Engineers camping, fishing, swimming and boating stations, the original idea of developing such facilities began at Leech Lake. The reason was that the swampland and Indian reservation around Leech Lake made it less accessible to the general public.



Ole Henderson, pictured here after his retirement in 1975, was a dam tender at Leech Lake for many years. He first began working for the Corps around World War I when the dredge "Mankato" was clearing a channel from Leech Lake to the Mississippi River.

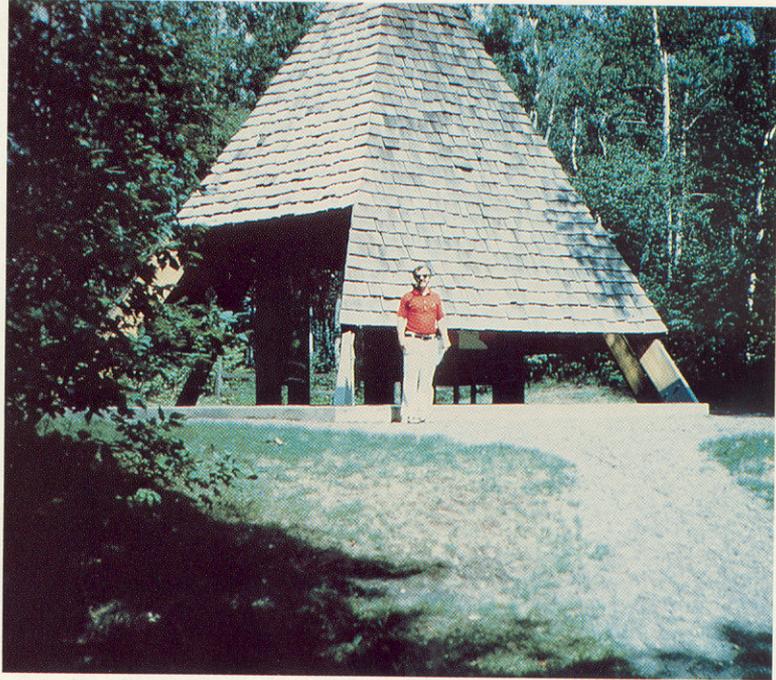
Consequently, while the other reservoirs could provide ample public access, Leech Lake could only be easily entered through the government property around the federal dam. What is surprising is that a license to open a public boat landing at Leech Lake was issued as early as 1913.¹⁴⁰ Actually, a permit to build a boathouse and repair shop was granted to Captain A. A. Hain the year before; but when it became obvious that Captain Hain was building a small hotel and planned to open a resort, his permit was revoked.¹⁴¹ A year later John W. Kelsey was given a license to erect a temporary structure to serve the boating public. He was required to fence off the land, keep the premises in good repair, and to sign an agreement which prohibited disorderly conduct, dumping, drinking and furnishing meals or sleeping accommodations.

Dam tenders aided fishermen by marking the channel into Leech Lake each spring. Public use of these Leech Lake facilities continued to expand, and by the 1950s it was obvious that other basic amenities would have to be provided. Ole Henderson, the dam tender at Leech Lake in 1958, constructed outdoor privies and began to make parking provisions for camping trailers.¹⁴² Within ten years 28,000 visitors were coming to Leech Lake annually. Dam tenders at other federal reservoirs also were authorized to provide picnic areas for the increasing number of vacationers who were visiting the 2,300 acres of federal property around the dam sites.

Providing such recreational facilities was a national trend. In 1957, nation-wide, eighty-five million visitor days were recorded at Corps of Engineers dam sites. By 1970 visitor days had increased to 254 million.¹⁴³ In 1959 the St. Paul District spent \$2,200 on recreational development.¹⁴⁴ By 1965 a recreational master plan for the district had been approved and in carrying it out the Corps expended \$63,991.¹⁴⁵ Expansion in the next five years was phenomenal. By 1972 the district had invested \$1,084,000 in the improvement of camping facilities at its six upriver reservoir sites.¹⁴⁶ Ten rangers were hired in 1970 and a policy of minimal fees for overnight camping was initiated. In 1975 over four million visitors used the six Corps reservoir recreational facilities.¹⁴⁷

As could be expected, the recreational areas were not developed without conflict and controversy. The construction of the Gull Lake camping site was held back a number

This tepee-like structure at Gull Lake was built by the Corps of Engineers to explain the Indian culture of the vicinity. It is part of the recreational and educational facilities at that site.



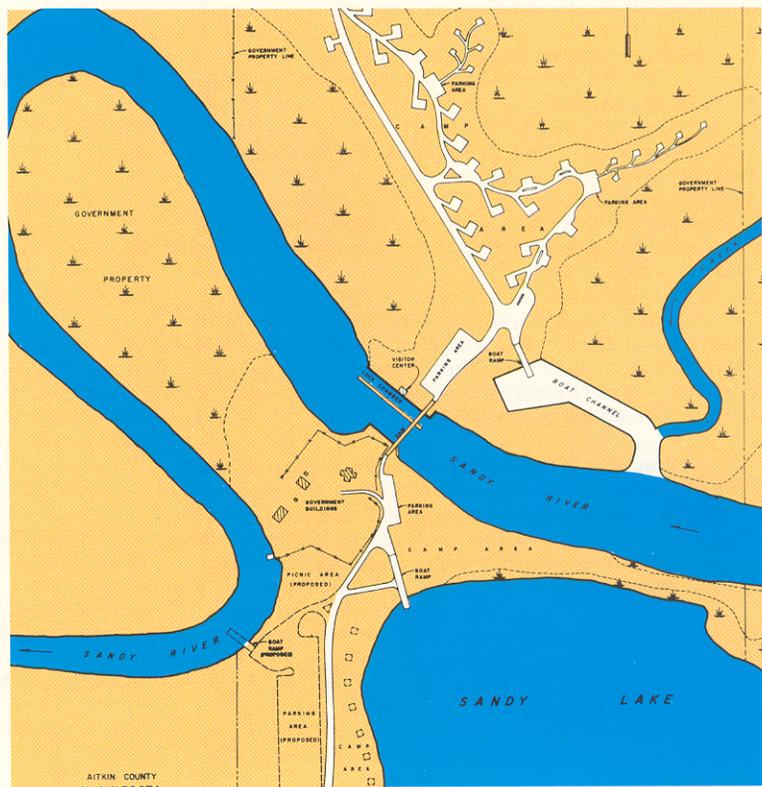
of years by local residents who were concerned with the adverse impact on private resort business of an attractive campground with low rental rates.¹⁴⁸ Other environmental issues were also raised, such as the need for increased law enforcement and the added traffic problems over a road which narrowed to a single lane over the Gull Lake dam. The Corps felt that it could handle traffic control and law enforcement. However, the discovery of an ancient Indian burial ground in the midst of the planned campsite called for special consideration. Dr. Elden Johnson, Minnesota state archeologist, examined the site and suggested that the Corps utilize the burial area as an educational and informational resource.¹⁴⁹ Thus, in addition to developing a campground with forty-one camping pads, a comfort station with flush toilets, showers and laundry facilities, sewage treatment facilities, a pressurized water system with spigots throughout the site, a sanitary dump station for holding tanks, canoe docking, parking facilities, and a ranger station, the Corps had built at Gull Lake and an Indian museum and a trail through the Indian mound area.

Russell "Ike" Kolb, the dam tender at Sandy Lake, was instrumental in converting the old lock house there into another visitor's museum. One of the first artifacts Kolb located for the museum was the old pilot wheel from the Corps dredge, the "Oriole." It was being used as a clothesline by a local resident. Most of the materials in the

Sandy Lake museum are from the collection of Irving Hart and his family. The Harts undertook a number of archeological digs along the Sandy Lake portage and unearthed the remains of a frontier blacksmith shop containing many examples of early ironwork.¹⁵⁰

In 1805 Lieutenant Zebulon M. Pike came into the headwaters region, negotiated with the Indians, and shot down the British flag over a trader's post at Leech Lake. There is little doubt that Hugh McGillis, the independent and defiant proprietor of the wilderness emporium, put another British flag up when the United States Army departed. For the next 170 years the federal government would continue to have an interest in stimulating development in the headwaters area. The local residents are still independent. The Corps is still there to represent the federal government, to raise the flag and to protect the water resources for all the people. In accomplishing its mission, as this summary shows, Corps policies have not been inflexible, but have reflected the complexity and evolution of the society they were directed to serve. The trail has not been a smooth one. Pike had his problems, and every district engineer has encountered difficulties of one kind or another. Controversy and conflict have been the norm.

Recreational design and development have become important aspects of Corps work. The camping site at Sandy Lake is only one of over fifty such public use areas maintained by the St. Paul District. Over two million dollars have gone into the development of these recreational facilities in the past twenty years.



NOTES

1. *Annual Report, 1874*, pp. 277-300; 1894, p. 264.
2. *Annual Report, 1880*, pp. 178-79; 1879, p. 134.
3. The "Enterprise," was removed to the Red River and named the "Anson Northup." William J. Petersen, *Steamboating on the Upper Mississippi* (Iowa City: 1968), p. 165. See Mildred Hartsough, *From Canoe to Steel Barge on the Upper Mississippi* (Minneapolis: 1934), p. 97, for the early history of the "Governor Ramsey," the first steamboat on this section of the river (1850).
4. *Annual Report, 1881*, pp. 240-41; 1875, p. 62.
5. *Annual Report, 1894*, p. 264.
6. *Annual Report, 1891*, p. 210; Theodore C. Blegen, *Minnesota: A History of the State* (Minneapolis: 1963), p. 296.
7. *Annual Report, 1908*, p. 533.
8. Charles Ellet, Jr., "Reports on Overflows of the Delta of the Mississippi," 32 Congress, 1 session, *Senate Executive Documents*, no. 20; Gene D. Lewis, *Charles Ellet, Jr.: The Engineer as Individualist, 1810-1862* (Urbana: 1968), pp. 133-51.
9. See, for example, Elmer Corthell, *A History of the Jetties at the Mouth of the Mississippi River* (New York: 1880), p. 25.
10. Raymond H. Merritt, *Engineering in American Society, 1850-1875* (Lexington: 1969), pp. 9-11.
11. Arthur E. Morgan, *Dams and Other Disasters: A Century of the Army Corps of Engineers in Civil Works* (Boston: 1971), p. 256.
12. Andrew A. Humphreys and Henry L. Abbot, *Report Upon the Physics and Hydraulics of the Mississippi River, Upon the Protection of the Alluvial Region Against Overflow; and Upon the Deepening of Mouths* (Washington: 1861).
13. Arthur E. Morgan claims in his study of the Corps of Engineers that the chief's office was strongly opposed to the idea of reservoirs until President Herbert Hoover appointed General Lytle Brown Chief of the Corps in 1929. See Morgan, *Dams and Other Disasters*, pp. 252-302.
14. Blegen, *Minnesota*, pp. 321, 349-54, 388, 390; Charles B. Kuhlmann, *The Development of the Flour Milling Industry in the United States*, (Boston: 1929), pp. 132-34. Isaac Atwater, *History of Minneapolis, Minnesota* (New York: 1893), II, pp. 545-50; James Gray, *Business Without Boundary: The Story of General Mills* (Minneapolis: 1954), pp. 5-19.
15. *Proposals of the Minneapolis Mill Company for the Sale of their Land and Water Power* (1857), a leaflet in Minnesota Historical Society library.
16. Lucile M. Kane, *The Waterfall that Built a City* (St. Paul: 1966), p. 61.
17. Kane, *The Waterfall that Built a City*, p. 129; *Annual Report, 1870*, p. 59; and Appendix I-7.
18. *Minneapolis Journal*, September 29, 1905.
19. *Annual Report, 1869*, p. 237; 46 Congress, 2 session, *House Executive Documents*, no. 39; "Examination of Sites for Resources at Headwaters of Mississippi River," 43 Congress, 2 session, *Senate Executive Documents*, no. 19; see also 46 Congress, 3 session, *Senate Executive Documents*, no. 48; 45 Congress, 3 session, *House Executive Documents*, no. 48; *Annual Report, 1870*, pp. 1590-1620.
20. *Annual Report, 1880*, pp. 182-83. Among those who strongly opposed the headwaters reservoirs was Ignatius Donnelly; see *St. Paul Daily Globe*, September 4, 1885; *Keokuk Daily Constitution*, August 22, 1877.
21. *Quincy Daily Herald*, October 17, 1879.
22. Kane, *The Waterfall that Built a City*, pp. 131-32.
23. Kane, *The Waterfall that Built a City*, p. 134.
24. *Minneapolis Journal*, September 29, 1905.
25. *Annual Report, 1881*, pp. 245-46.
26. *Annual Report, 1885*, p. 272.
27. *Annual Report, 1887*, p. 225.
28. For an early history of the reservoirs see *Annual Report, 1887*, pp. 1666-97.
29. Kane, *The Waterfall that Built a City*, p. 115.
30. *St. Paul Daily Globe*, August 31, 1878.
31. Kane, *The Waterfall that Built a City*, p. 158.
32. "Effect of the Federal Reservoirs upon the Flow of the Mississippi River for Navigation and Water Power Development During the Low-water Period of 1910," 62 Congress, 2 session, *Senate Documents*, no. 469, p. 175. This was the final report of the National Waterways Commission; Kane, *The Waterfall that Built a City*, p. 127.
33. Kane, *The Waterfall that Built a City*, pp. 118, 164; Gray, *Business Without Boundary*, pp. 22-23.
34. *Annual Report, 1897*, pp. 332-33; 54 Congress, 2 session, *House Documents*, no. 305.
35. *Annual Report, 1887*, pp. 1681 ff; 1909, p. 563.
36. *Annual Report, 1898*, p. 317.

37. One reason for the durability of these dams was probably Major Abbot's insistence that the Philadelphia firm of Booth, Garrett and Blair have an inspector test the quality of cement used. Major Frederic V. Abbot to General John Wilson, January 20, 1899, SPD, Letters Received and Sent, Reservoirs, NARG77; see also *Annual Report, 1901*, p. 2313.
38. William de la Barre to Lieutenant Colonel Charles L. Potter, April 8, 1913, SPD, Letters Sent (press copies) NARG77.
39. *Annual Report, 1912*, p. 818.
40. *Upper Mississippi River Comprehensive Basin Study* (Chicago: 1970), V, pp. I-37, 40.
41. Quoted in *Walker Pilot*, November 6, 1903.
42. *Walker Pilot*, September 2, 1904.
43. *Minneapolis Journal*, July 3, 1905.
44. Quoted from *St. Paul Dispatch*, July 7, 1905; see *Duluth News Tribune*, July 8, 1905.
45. *Duluth News Tribune*, August 19, 1905. One hundred dollars was contributed by the Duluth and Iron Range Railroad.
46. *St. Paul Pioneer Press*, July 18, 1905.
47. *St. Paul Pioneer Press*, July 18, 1905.
48. *St. Paul Pioneer Press*, July 18, 1905.
49. *Aitkin Republican*, July 22, 1905.
50. *St. Paul Pioneer Press*, August 11, 1905; *Duluth News Tribune*, August 11, 1905, September 11, 1905. Senator Chauncey McCarthy's quote from last citation.
51. *Duluth News Tribune*, August 20, 1905; 56 Congress, 2 session, *House Executive Documents*, no. 113; *Annual Report, 1901*, p. 451, Appendix AA-13.
52. The letter was quoted in the *St. Paul Dispatch*, August 19, 1905.
53. *St. Paul Pioneer Press*, September 12, 1905.
54. The quotations in this and the following paragraph are taken from reports in *The Minneapolis Journal*, September 13, 1905.
55. *Minneapolis Journal*, September 14, 1905.
56. *The Great Water Power of the Northwest at the Head of St. Louis Bay* (Philadelphia: 1883); William F. Phelps, "The Rise and Progress of a Great Trade Center—Duluth," *Magazine of Western History*, November, 1888-April, 1889, vol. 9, pp. 167-77.
57. The final report of the board of engineers, "Upon matters connected with the Operations of the Reservoirs at the Headwaters of the Mississippi River," dated November 27, 1905, can be found in *Annual Report, 1906*, Appendix AA-3; see also Major Francis Shunk to Colonel William H. Bixby, February 14, 1908, SPD, Letters Sent (press copies) NARG 77.
58. *Duluth News Tribune*, May 30, 1906.
59. St. Paul District Corps of Engineers, *Master Reservoir Regulation Manual for Mississippi River Headwaters Reservoirs*, p. 25.
60. *Annual Report, 1951*, p. 1294.
61. The Aitkin diversion channel was authorized by the Flood Control Act of June 30, 1948; see 80 Congress, 2 session, *House Executive Documents*, no. 599. Corps of Engineers, North Central Division, *Water Resources Development in Minnesota* (Chicago: 1975), p. 14.
62. Petition, August 9, 1900, for locks in Leech and Winnibigoshish lakes, SPD, Letters Received and Sent, Reservoirs, NARG 77.
63. Archibald Johnson to C. E. Seebye, E. Fleming, L. H. Brown, A. J. Stansfield, *et al.*, June 10, 1899, and August 19, 1900, asking for locks at Leech and Winnibigoshish lakes, in SPD, Letters Received and Sent, Reservoirs, NARG 77.
64. *Annual Report, 1907*, p. 499.
65. *Annual Report, 1908*, p. 532.
66. *Annual Report, 1914*, p. 955; 63 Congress, 1 session, *House Executive Documents*, no. 243.
67. Lieutenant Colonel Charles L. Potter to OCE, March 15, 1915, and November 14, 1913, SPD, Letters Sent (press copies) NARG 77; *Annual Report, 1916*, p. 1108; abandoned by Congress on July 27, 1916.
68. *Annual Report, 1915*, p. 1032; Major Francis Shunk to OCE, June 17, 1909, SPD, Letters Sent (press copies) NARG 77.
69. *Annual Report, 1910*, p. 678; Act of June 25, 1910; *Statutes at Large*, vol. 36, part I, p. 659; 61 Congress, 2 session, *House Executive Documents*, no. 363.
70. *Annual Report, 1912*, p. 818; Major Francis Shunk to OCE, August 8, 1911, SPD, Letters Sent (press copies) NARG 77.
71. Lieutenant Colonel Charles L. Potter to OCE, June 4, 1914, SPD, Letters Sent (press copies) NARG 77.
72. *Annual Report, 1915*, p. 1032.
73. Lieutenant Colonel Charles L. Potter to Charles A. Lindbergh, June 28, 1915; Major Francis Shunk to OCE, July 6, 1911; Shunk to Cass Lake Commercial Club, July 6, 1911; Shunk to OCE, February 13, 1912, all in SPD, Letters Sent (press copies) NARG 77.
74. Lieutenant Colonel Charles L. Potter to United States District Attorney, District of Minnesota, September 23, 1912, SPD, Letters Sent (press copies) NARG 77.

75. *Upper Mississippi River Comprehensive Basin Study*, V, p. 1-47.
76. Major Francis Shunk to C. A. Smith Lumber Company, June 8, 1909, SPD, Letters Sent (press copies) NARG 77.
77. Major Francis Shunk to Edward J. Dugan, March 17, 1911, SPD, Letters Sent (press copies) NARG 77.
78. Major Francis Shunk to Grand Rapids Commercial Club, March 27, 1911, SPD, Letters Sent (press copies) NARG 77.
79. In 1898 numerous letters in SPD, Letters Sent (press copies) NARG 77, between logging interests and the dam tenders indicate that water was stored and released to accommodate the sluicing of logs; see also *Annual Report, 1910*, p. 635.
80. Blegen, *Minnesota*, p. 325.
81. *Annual Report, 1882*, p. 237; *1926*, p. 1062.
82. Congress passed "An Act authorizing the Secretary of War to make regulations governing the running of loose logs, steamboats, and rafts on certain rivers and streams," on May 9, 1900, *Statutes at Large*, vol. 31, p. 172, but specific rules for this section of the Mississippi were never issued until after the industry stopped using the river. *Annual Report, 1900*, p. 438; circular letter from Lieutenant Colonel Charles L. Potter to newspaper editors, March 27, 1915, and Potter to OCE, January 21, 1915, SPD, Letters Sent (press copies) NARG 77.
83. *Minneapolis Journal*, August 30, 1905.
84. Major Francis Shunk to OCE, September 13, 1909, SPD, Letters Sent (press copies) NARG 77.
85. Major Francis Shunk to Arthur M. Mampel, June 30, 1910, SPD, Letters Sent (press copies) NARG 77.
86. Lieutenant Colonel Charles L. Potter to Glenn E. Judy, July 7, 1915, SPD, Letters Sent (press copies) NARG 77; a copy of the Judy petition could not be found in the archive collection.
87. Lieutenant Colonel Charles L. Potter to OCE, January 21, 1915, SPD, Letters Sent (press copies) NARG 77.
88. Major Ernest Peek to T. J. Welsh, July 7, 1915, SPD, Letters Sent (press copies) NARG 77.
89. Major Francis Shunk to OCE, September 1, 1908, SPD, Letters Sent (press copies) NARG 77. A further discussion of the Refuse Act can be found in Chapter Five.
90. Major Francis Shunk to Little Falls Waterpower Company, September 17, 1908, SPD, Letters Sent (press copies) NARG 77.
91. Major Francis Shunk to OCE, November 28, 1908, SPD, Letters Sent (press copies) NARG 77.
92. Major Francis Shunk to Little Falls Waterpower Company, May 6, 1909, SPD, Letters Sent (press copies) NARG 77.
93. *Annual Report, 1906*, p. 473.
94. *Annual Report, 1907*, p. 501.
95. *Annual Report, 1918*, p. 1188.
96. *Annual Report, 1919*, p. 1259.
97. *Annual Report, 1921*, p. 1230. For a description of the "Oriole" see Major Francis Shunk to OCE, September 1, 1909, SPD, Letters Sent (press copies) NARG 77.
98. The project was approved on March 4, 1913, and completed in 1926. See 62 Congress, 3 session, *House Executive Documents*, no. 1223.
99. Papers relating to the legal negotiations for property on the reservoirs between 1881 and 1936, occupy more filing space than any other type of record in the St. Paul District office.
100. Lieutenant Colonel Charles L. Potter to J. M. Elder, August 19, 1913, SPD, Letters Sent (press copies) NARG 77.
101. See, for example, Major Francis Shunk to the Cass Lake Commercial Club, August 5, 1910, and Shunk to Arthur L. Mampel, July 29, 1910, SPD, Letters Sent (press copies) NARG 77.
102. Minimum and maximum reservoir limits were set by the Secretary of War on February 11, 1931, and were modified on February 4, 1936, and December 29, 1944, see *Annual Report, 1932*, p. 1138; *1936*, p. 926; *1945*, p. 1298. On real estate development problems, see *Annual Report, 1905*, p. 435; the first rules of operation were listed in *Annual Report, 1908*, p. 534.
103. Lieutenant Colonel Francis Shunk to John Duncan, January 12, 1912, SPD, Letters Sent (press copies) NARG 77.
104. John Wade to Major Ernest D. Peek, July 23, 1915, SPD, Letters Sent (press copies) NARG 77.
105. Major Francis Shunk to OCE, February 25, 1909, SPD, Letters Sent (press copies) NARG 77.
106. Major Frederic V. Abbot to Brigadier General John M. Wilson, July 26, 1898, SPD, Letters Received and Sent, Reservoirs, NARG 77.
107. Major Francis Shunk to OCE, February 25, 1909, SPD, Letters Sent (press copies) NARG 77.
108. Summary of past history in Major William A. Jones to General Thomas L. Casey, January 30, 1895, SPD, Special Correspondence Relating to Reservoirs, NARG 77.
109. Major William A. Jones to General Thomas L. Casey, December 30, 1891, SPD, Special Correspondence Relating to Reservoirs, NARG 77; *Statutes at Large*, vol. 21, p. 488.

110. See Whipple's report to the Board of Missions of the Protestant Episcopal Church, "On the Moral and Temporal Condition of the Indian Tribes in our Western Border, 1868," in Henry Benjamin Whipple, *Lights and Shadows of a Long Episcopate* (New York: 1913), pp. 521-48; for references to the Leech Lake situation, see pp. 45-48, 314-15.
111. Act of August 19, 1890, *Statutes at Large*, vol. 26, p. 339.
112. Lieutenant Colonel Charles L. Potter to OCE, May 22, 1913, SPD, Letters Sent (press copies) NARG 77.
113. The major source for this war is Louis H. Roddis, "The Last Indian Uprising in the United States," *Minnesota History*, vol. 3, (1920), pp. 275-90; and a pamphlet, *Last Indian War in the United States October 1898*, (Walker: 1952). Other references to this incident can be found in Pauline Wold, "Some Recollections of the Leech Lake Uprising," *Minnesota History XXIV* (1943), pp. 142-51; *Minnesota Chippewa Bulletin*, December 26, 1942, pp. 3-4; other accounts are given in the *St. Paul Dispatch* for September 29, October 1, 4-8, 10, 12, 13, 18 and 19, 1898.
114. Major Frederick V. Abbot to Adjutant General, Department of Dakota, October 3, 1898; and telegrams from Abbot to OCE on October 3, and October 8, 1898. See also Abbot to Olaf Johnson, October 8, 1898, all in SPD, Letters Received and Sent, Reservoirs, NARG 77.
115. L. Fletcher to General John M. Wilson, January 20, 1899; and H. A. Libby to Secretary of War, January 16, 1899, SPD, Letters Received and Sent, Reservoirs, NARG 77.
116. Major Frederic V. Abbot to OCE, February 23, 1899, SPD, Letters Received and Sent, Reservoirs, NARG 77.
117. Major Frederic V. Abbot to George Snetzinger, October 4, 1899, SPD, Letters Received and Sent, Reservoirs, NARG 77.
118. Major Francis Shunk to OCE, August 5, 1909, SPD, Letters Sent (press copies) NARG 77. copies) NARG 77.
119. Major Frederic V. Abbot to OCE, September 14, 1899, SPD, Letters Received and Sent, Reservoirs, NARG 77.
120. *St. Paul Pioneer Press*, November 14, 1975; Lieutenant Colonel Charles L. Potter to OCE, May 22, 1913, and Major Francis Shunk to Superintendent, Leech Lake Agency, August 2, 1911, SPD, Letters Sent (press copies) NARG 77; see also statement of E. C. Walker submitted to public hearing at Grand Rapids on June 27, 1962, in minutes of hearing, "On Review Report, Mississippi River Above Coon Rapids Dam in the Interest of Navigation, Flood Control and Other Useful Purposes," SPD, Reservoir project file, St. Paul.
121. *Annual Report, 1956*, p. 1188; 1949, p. 1455.
122. *Annual Report, 1957*, p. 1150.
123. Major Francis Shunk to OCE, April 3, 1911, SPD, Letters Sent (press copies) NARG 77.
124. Major Francis Shunk to OCE, April 3, 1911, SPD, Letters Sent (press copies) NARG 77; Senate Document No. 469, 62 Congress, 2 Session, p. 175.
125. Lieutenant Colonel Charles L. Potter to Colonel Curtis M. Townsend, October 13, 1914, SPD, Letters Sent (press copies) NARG 77.
126. Lieutenant Colonel Charles L. Potter to Congressman Charles A. Lindbergh, June 28, 1915, SPD, Letters Sent (press Copies) NARG 77.
127. Lieutenant Colonel Charles L. Potter to OCE, April 5, 1915, SPD, Letters Sent (press copies) NARG 77.
128. Lieutenant Colonel Charles L. Potter to Congressman Charles A. Lindbergh, June 28, 1915, SPD, Letters Sent (press Copies) NARG 77.
129. Major Francis Shunk, Report, 1908, SPD, Letters Sent (press copies) NARG 77.
130. Lieutenant Colonel Charles L. Potter to A. C. Whitney, July 19, 1913, SPD, Letters Sent (press copies) NARG 77.
131. *Annual Report, 1887*, p. 1666.
132. *Annual Report, 1909*, p. 565.
133. Lieutenant Colonel Charles L. Potter to A. C. Whitney, July 19, 1913, SPD, Letters Sent (press copies) NARG 77.
134. A. J. Carlson and Ralph C. Johnston, "The Economic Utilization of the Upper Mississippi River Federal Reservoirs," Civil Engineering thesis, University of Minnesota, (1917); in 1955 a new federal regulation established a policy of "released water" to benefit power plants along the Mississippi from Grand Rapids to St. Paul. See Twin Cities Metropolitan Planning Commission, "Metropolitan Water Supply, Part I," February, 1960.
135. *Annual Report, 1931*, p. 1235; see also St. Paul District, "Regulations for the Use and Administration of the Reservoirs at Headwaters of the Mississippi River," summary of orders of February 11, 1931, SPD, Reservoir project file, St. Paul.
136. *Minnesota Laws 459* (1961); see also *Annual Report, 1961*, p. 1248.
137. At a public hearing held on June 22, 1962, at Grand Rapids, Joseph W. Ryan, attorney for the Aitkin Drainage and Conservatory District testified that a state-appointed commission could not withstand the political pressures of regulating the reservoirs and advocated that the power be left with the Corps of Engineers. See minutes of hearing, "On Review Report, Mississippi River above Coon Rapids Dam in the Interest of Navigation, Flood Control and other Useful Purposes," SPD, Reservoir project file, St. Paul.

138. U.S. Army Division, North Central, *Upper Mississippi River Comprehensive Basin Study* (Chicago: 1970), in nine volumes.
139. Lieutenant Colonel Francis Shunk to *St. Paul Dispatch and Pioneer Press*, May 9, 1912, SPD, Letters Sent (press copies) NARG 77.
140. Lieutenant Colonel Charles L. Potter to OCE, August 20, 1913, SPD, Letters Sent (press copies) NARG 77.
141. Lieutenant Colonel Charles L. Potter to OCE, August 20, 1913, SPD, Letters Sent (press copies) NARG 77.
142. Interview of Raymond H. Merritt with Ole Henderson, at his home near Boy River, Minnesota, on August 22, 1975, notes in the possession of the author.
143. Corps of Engineers, "Gull Lake Site, Mississippi Headwaters Recreation Areas," Water Resources Fact Sheet, November 27, 1970, pp. 4-5.
144. *Annual Report, 1959*, p. 1191; *1960*, p. 1179; funds for recreation are reflected in the budget, but not mentioned in the text until 1961 and then played down; *Annual Report, 1961*, p. 1248. Money first became available in 1946; see *Annual Report, 1946*, p. 1399.
145. *Annual Report, 1965*, pp. 1023-24.
146. Corps of Engineers, "The Corps of Engineers Program for Water Resources Development in Minnesota: The Upper Mississippi River Basin," Water Resources Fact Sheet, November 17, 1972, p. 9.
147. Corps of Engineers, *Water Resources Development in Minnesota*, January 1, 1975, p. 19.
148. Interview of Raymond H. Merritt with Edward Sunde, at his home on Leech Lake on August 22, 1975, notes in the possession of the author.
149. Corps of Engineers, "Gull Lake Site, Mississippi Headwaters Recreation Areas," Water Resources Fact Sheet, November 27, 1970, pp. 7-9.
150. Evan A. Hart, "A Frontier Smitty in Wisconsin Territory," *Wisconsin Magazine of History* (Summer, 1957), vol. 40, no. 4, pp. 261-69.