

Chapter Seven Wisconsin Waters

Four major streams—the St. Croix, the Chippewa, the Black and the Wisconsin—and their tributaries drain the western two-thirds of the state of Wisconsin. The largest of these, the Wisconsin River, begins north of Rhinelander and cuts through the rock and sand of fifteen counties in the heart of the badger state before emptying into the Mississippi River at Prairie du Chien. The Wisconsin, with its natural portage to the Fox River, dominated the history of Europeans in Wisconsin during more than two hundred years (1634-1874) of trading, mining and lumbering activities. Between 1874 and 1910 the Black and Chippewa rivers became centers of commercial activity when lumbermen used these waterways to float millions of feet of pine to mills along the Mississippi. The St. Croix, on the Wisconsin-Minnesota boundary, has been one of the most heavily utilized rivers in the badger state. Like the Wisconsin River, an early transportation route from the Great Lakes into the middle west, it became a prolific source of lumber during the logging era, supported a significant amount of commercial traffic, and has always been a source of pleasure for fishermen, excursion passengers and sailing enthusiasts.

The Corps of Engineers' responsibilities have been closely related to the commercial and recreational uses of these scenic rivers. The Corps was active on the Wisconsin River from 1817 to 1883, improved navigation on the Chippewa between 1875 and 1902, developed a special harbor project on the Black between 1937 and 1950 and from 1875 to the present has been involved in channel development and harbor facilities along the St. Croix River. Since the passage of the flood control legislation of the 1930s, the Corps has been active in numerous other projects in western Wisconsin. These activities will be described in Chapters Nine and Ten. Though the demands

Most of the rivers in Wisconsin flow into the Mississippi River watershed. The four most important in the St. Paul District are the St. Croix, the Chippewa, the Black and the Wisconsin.

View of the mouth of the Wisconsin River. This photo was taken in August, 1934, when this reach of the Mississippi River was at its lowest recorded point.

of navigation in Wisconsin waters were never as extensive as in western waters or along the Mississippi, the controversies and conflicts regarding these rivers were intense. Events in Wisconsin demanded much attention and administrative effort and tested the patience and ethical fortitude of many district engineers. The personal integrity of Corps leaders as public servants, in the face of powerful commercial pressures during this early period, provided important guidelines for those who were responsible for preserving the free use of inland water resources.



The Wisconsin River

During the era of the canoe, the Wisconsin River was much used for transporting people and goods. In the brief period of the raft, the lower Wisconsin served frontier commercial interests. When the steamboat made its appearance on western waters, the utility of the Wisconsin was called into question. Though the commercial expectations of grain shippers, river town boosters and real estate investors produced great pressure on Congress and the Corps to improve the Wisconsin, Corps officers doubted the practicality of making the river into a barge canal.¹ By 1885 project engineers had convinced the Board of Engineers to abandon improvements on the Wisconsin, even though Congress had spent over \$400,000 on experimental designs to make the river a navigable stream.² The Corps' decision was vindicated when Wisconsin developed into a dairy rather than a grain producer and there was little need for the water transport of agricultural products.

No one ever expected the Corps to improve the northern stretch of the Wisconsin above Portage, Wisconsin. There the long section which flows out of the north woods and cuts through limestone is very crooked in many sections and full of rapids and rocks. It was estimated that this region had over 130 billion feet of pine when Dan Whitney opened the first sawmill in 1832 below Wisconsin Rapids.³ Few sawmills survived in this region until the railroad arrived; it was too hazardous to raft cut lumber down the upper Wisconsin.⁴ Consequently, most of the pine logs cut in this area were floated unsawed to large booms on the lower Wisconsin, where they were sorted for the sawmills on the Mississippi below Prairie du Chien. The float-time for logs downriver from Wausau, Wisconsin, to St. Louis was twenty-four days.

An explosive controversy on this upper section of the Wisconsin revolved around dams constructed to furnish power for local sawmills. Though mill owners designed most of their dams with sluiceways for logs, the openings were inadequate for rafts. The Kilbourn dam, which blocked the river at the bottom of the Wisconsin Dells, formed a barrier to the free use of the river for many years. Finally, the conflict developed into violence when 300 raftsmen got together and blew up the dam.⁵

The appearance of small sawmills, usually powered by water wheels, marked the first stage of the lumbering industry. This government sawmill was located on the Minnesota River at Redwood Falls, Minnesota, in 1869.

While rocks and rapids and bends deterred commercial navigation on the upper Wisconsin, sand banks and multiple channels made navigation just as difficult on the lower Wisconsin. There were hundreds of islands in the stretch of river from Prairie du Chien to Portage. Shifting sandbars continually changed the channel. Major David C. Houston studied a sandbar near Portage in 1871 and found that it moved an average of thirty-nine feet a day and in a period of twenty-four days had moved 940 feet.⁶

Between 1840 and 1870 it appeared that the stretch of land along the lower Wisconsin would become the commercial center of the state. Many towns in the area



hoped to become metropolitan centers of Wisconsin. During the early 1840s Mineral Point was the largest city in the state. Over ninety per cent of the lead mined in that area was rafted down the Wisconsin River. But Mineral Point's prospects dimmed between 1847 and 1857, when lead production diminished by fifty percent.⁷ By the mid-1850s, Prairie du Chien had become a major commercial center of Wisconsin and shipments of lumber and wheat replaced lead on the river. In 1849 Wisconsin produced about four million bushels of wheat, and in 1856 the harvest was over twenty-eight million bushels. During the same period the total number of sawmills in the state increased from twenty-four to 107.⁸ In the early 1870s Portage had expectations of metropolitan grandeur. The Portage Canal opened in 1874 by the Corps of Engineers was likened to the Erie Canal, but the dream was short-lived. By the late 1870s it was clear that no villages on the Wisconsin would rival the Great Lakes port city and railroad center of Milwaukee as the commercial entrepôt of Wisconsin. An office of the Corps was established in Milwaukee and the responsibility for the improvement of the Wisconsin River was transferred there from St. Paul.⁹

The idea of linking the Wisconsin and Fox rivers by canal goes back to 1837. In that year a charter was issued for the construction of a canal at Portage. The project was abandoned a year later when the Portage Canal Company ran out of funds. When the Wisconsin state constitutional convention met in 1846 a Board of Public Works was set up with the power to sell land for a canal at Portage. The canal project, supplemented with federal funds in 1854, was opened by 1856 and was controlled by a private company, the Green Bay and Mississippi Canal Company. The same company built a series of dams, locks and canals along the Fox River which were used primarily to produce water power for the growing industrial mills of the Neenah-Menasha area. The system was not managed well and was poorly designed.¹⁰ Consequently, in September, 1872, the federal government purchased the whole complex for \$145,000 and began to rebuild it. By 1904 the Corps had spent over three million dollars in constructing eighteen new locks, nine composite locks, thirteen canals and a multitude of other projects, including over three million cubic yards of dredging.¹¹ The canal supplied a steady head of water for the industries of the Fox River valley. Yet navigation never was a primary use of this water system. Town boosters at Oshkosh, Green Bay, Neenah and

Menasha, and Prairie du Chien, like those at Portage, were disappointed, for they believed that their future greatness lay in the development of the Fox-Wisconsin transportation route. When the federal government took over the Portage Canal and the Fox River Valley locks and dams, these small town boosters, too, saw a new Erie Canal in the making.

From 1861 to 1867, Major Gouverneur K. Warren made a survey of the Wisconsin River and in April, 1868, recommended that it could be improved by a series of wing dams and dredging.¹² By August, 1868, he submitted a report with three alternatives: a three-foot channel produced by wing dam construction, with an estimated cost of \$428,000; a four-foot channel produced by developing side canals, with an estimated cost of \$3,207,000; and a five-foot channel produced by digging a canal parallel to the Wisconsin River at an estimated cost of \$4,164,000. This third alternative was recommended as the only sure way of establishing the river in a single channel, but Warren acknowledged that it was very difficult to justify the cost-benefit ratio of such a project.¹³

Under pressure from commercial interests, the Corps in 1871 initiated a series of experiments in building dikes and wing dams at the crossings Warren considered crucial in the second alternative. After four years and over \$300,000 in expenditures, the channel was not improved and the possibility of constraining the river to one channel was seriously questioned. Warren reported that "no satisfactory improvement of the Wisconsin can be made by a system of contraction and rectification." The Corps had built 150 dams (65,971 feet), four shore protections (2,293 feet), removed 1,215 snags and 5,820 trees, but had to report that "there has not been and is not now any navigation on the Wisconsin, due to the prevalence of sand-bars and the lack of a defined channel."¹⁴

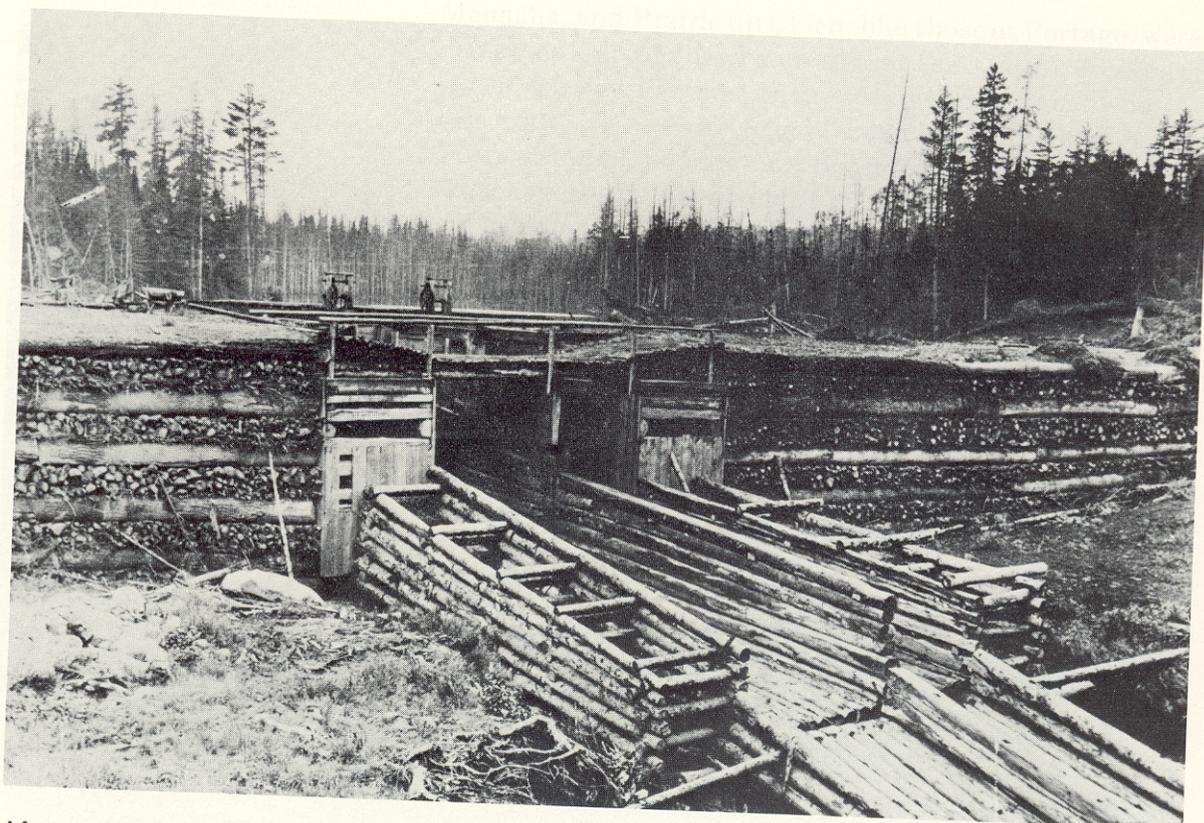
In 1879 the Board of Engineers made a personal investigation of the Wisconsin and after urgent requests from river valley residents decided that still another experiment should be attempted in a ten-mile stretch below Portage.¹⁵ Thus, in 1881 the Corps constructed 198 wing dams (85,992 feet) within four miles on the river. It was estimated that another 300,000 feet of wing dams would have to be built at a cost of over a million dollars if the whole stretch of the Wisconsin from Portage to Prairie du Chien were to be improved by this method.¹⁶



The mass cutting of timber and the floating of huge quantities of logs initiated the second phase of lumbering—the log boom stage. This log boom was located on Lake of the Woods in the early 1900's.

The mouth of the Wisconsin also posed a special problem because of extensive sand deposits. Engineers thought that building a four-mile canal terminating at Prairie du Chien would solve this problem.¹⁷ Yet Corps leaders could not justify such a large expenditure of funds.

In 1883 the St. Paul Chamber of Commerce came to the support of the Wisconsin project. The Minnesota organization argued that the Wisconsin River "should be a free highway for commerce, and thus forever a guaranty of cheap transportation, and of protection against monopoly and extortion." Twin Cities merchants felt that railroad rates were too high to Milwaukee. A waterway of 515 miles between St. Paul and Green Bay was viewed as "sound policy and wisdom for the state to maintain," even though "not a ton of merchandise was carried on it."¹⁸ The Corps refused to develop and maintain a river that would never float a steamboat or barge, just to produce a theoretical alternative transportation route. A second review of the whole situation by the Board of Engineers came in 1885 and the project was then finally abandoned.¹⁹ Newspapers in the Fox and Wisconsin valleys, especially at



After the timber was logged away from the major rivers, lumberjacks began to move deeper into the forests. To facilitate the transportation of the big timbers, they built log dams on the small streams and tributaries. This third phase of lumbering can be seen in this timber dam and sluiceway built in the Superior National Forest around 1900.

Oshkosh, were quick to point out that in abandoning the project, the Corps was admitting that the Fox-Wisconsin waterway was a two and one-half million dollar federal government failure.²⁰ It was more difficult for the residents of the two river valleys to admit that their dream had failed. Their transportation route could not compete with the economic advantages promised by the year-round transportation network of midwestern railroads.

The Chippewa And Black Rivers

Unlike the Wisconsin and St. Croix, the Chippewa and Black rivers were employed in the nineteenth century almost exclusively for lumbering. The Chippewa is 200 miles long and the Black is 183 miles— together they drain a region of 13,000 square miles which was then an immense area of virgin forest land.

The lumbering industry along these streams developed in three stages. In the first stage small sawmills near the forests sawed timber into boards, shingles and lath. The finished product was put on rafts and floated to markets downriver on the Mississippi. After about ten



When small sawmills could no longer process the excessive amounts of logs cut each year, logs were arranged into rafts at boom sites and towed to larger sawmills downriver on the Mississippi. Consequently, most of the timber from Wisconsin and Minnesota was processed into cut lumber from Iowa, Illinois, and Missouri. This photograph was taken at Wabasha, Minnesota, around 1910.

years a second stage began. Using capital resources from the East, lumbermen on the Mississippi ventured north and began purchasing large tracts of land along the Chippewa and Black flowages. They hired lumberjacks to cut and haul the trees to the rivers and floated the logs out of Wisconsin to large sawmills down the Mississippi. By the Civil War period the quantity of these logs was so great that boom companies were organized to hold and sort the logs before they were floated downstream. During the third stage, when over seventy-five per cent of all the timber in Wisconsin was cut and shipped outside the state for processing, large syndicates began to build their own dams to supply water for the large log drives. By this time the lumber companies were in complete control of the river systems. Sunken logs jammed the natural channels and flushing systems were necessary to float logs downriver.²¹

The lumbermen went about their business with little concern for federal or state regulation. The Northwest Ordinance and later the constitution of Wisconsin recognized that the federal government was responsible for maintaining free navigation on inland waterways. Yet prior to the Civil War the Corps did not have any engineering offices in the area. When offices were established at

St. Paul and Rock Island, the jurisdiction of the Black and Chippewa rivers was split between the two agencies. No surveys of the rivers were ordered until 1876. By that time lumbering interests had begun consolidation and were organizing boom companies. No improvements were recommended for the Black River, but controversy between the Corps and the lumber barons did occur on the Chippewa.

Jacob Spaulding and the Wood brothers, Robert and Andrew, were the first to take advantage of the lumber potential along the Black River. They established a sawmill in 1840 and three years later were producing three million feet of cut lumber.²² By 1844 eight mills were operating on the Black River, and by the time Wisconsin was admitted to the union in 1848, thirteen mills on the Black were producing about six million board feet annually. In 1854 the Black River Improvement Company built the first large log boom on the Black and the processing of logs moved to sites on the Mississippi. In 1879 the first Flooding Dam Association was organized and two years later the cutting of pine timber peaked along the Black River. During this period the water in the Black was entirely controlled by logging interests and all other navigation had ceased.

The city of La Crosse benefited greatly from the lumbering business and became the main port for steamboats transporting rafted logs from the Black River to Mississippi sawmills at Rock Island, Davenport and other towns.²³ As the accompanying table shows, nearly five billion feet of logs were taken out of the Black River, most of them in a twenty-five year period, 1867 to 1892.

The St. Paul District was not asked to make any improvements on the Black River until 1937 when \$85,000 was appropriated to improve the outlet of the Black above La Crosse for 1.4 miles.²⁴ A nine-foot channel was dredged in 1941 after the city of La Crosse agreed to pay for local improvements. Other developments on this stretch of the Black River were a public terminal, fuel storage terminals built by Socony-Vacuum Oil, the Texas Company, and the Barnley Association, and a Northern States Power Company coal depository.²⁵

The Chippewa flowage was approximately five times as large as that of the Black River. It has been estimated

TABLE 28
LOGS EXPORTED OUT OF THE BLACK RIVER, 1853-97

1853	12,000,000	1876	197,103,820
1854	3,000,000	1877	86,434,260
1855	30,000,000	1878	112,232,880
1856	35,000,000	1879	151,848,290
1857	30,000,000	1880	210,902,500
1858	20,000,000	1881	250,609,720
1859	15,000,000	1882	178,539,490
1860	12,000,000	1883	224,347,760
1861	10,000,000	1884	200,316,100
1862	12,000,000	1885	152,836,480
1863	15,000,000	1886	135,811,640
1864	6,000,000	1887	164,634,760
1865	46,550,770	1888	156,348,150
1866	47,924,000	1889	152,574,960
1867	88,632,300	1890	207,399,470
1868	57,395,560	1891	129,165,380
1869	160,573,890	1892	160,006,140
1870	110,920,870	1893	90,099,760
1871	127,055,590	1894	100,378,120
1872	125,766,190	1895	101,974,380
1873	195,398,830	1896	85,773,680
1874	188,907,320	1897	74,007,570
1875	188,344,640		

From: William Rector, *Log Transportation in the Lake States Lumber Industry, 1840-1918* (Glendale: 1953), Appendix III.

that one-sixth of all the pine forests in the United States grew along this river.²⁶ More than fifteen billion feet of logs were taken from the Chippewa flowage in a fifty-year period (1855-1905). In 1892, the peak year, 632,350,670 feet of logs were floated down the Chippewa.

TABLE 29 **LOOSE LOGS ON THE CHIPPEWA RIVER**

1879 . . . 250,000,000 board feet	1887 . . . 404,302,650 board feet
1880 . . . 300,000,000 board feet	1888 . . . 542,437,000 board feet
1881 . . . 300,000,000 board feet	1889 . . . 400,518,720 board feet
1882 . . . 350,000,000 board feet	1890 . . . 606,992,790 board feet
1883 . . . 450,000,000 board feet	1891 . . . 284,134,430 board feet
1884 . . . 534,674,176 board feet	1892 . . . 632,350,670 board feet
1885 . . . 600,000,000 board feet	1893 . . . 488,926,000 board feet
1886 . . . 465,000,000 board feet	

From: Office of the Chief of Engineers
Annual Report, 1894, p. 1721

Such a quantity of logs was bound to cause problems. One of the largest log jams in history occurred in 1869 when an estimated 130 million feet of timber were jammed on the Chippewa River.²⁷

The mills at Chippewa Falls and Eau Claire were hard pressed to take care of the supply of pine logs. In 1860 a single mill could process about 50,000 feet a day. By 1870 milling equipment had improved and one mill could cut

The annual log jam at the St. Croix Dalles became a major tourist attraction over a thirty-year period. This photograph was taken in 1870.



between 100,000 and 200,000 board feet into lumber in a twelve-hour period. In 1867, Pound, Halbert, and Company of Chippewa Falls thought it had set a world record with 207,400 feet processed in one twelve-hour day. The record did not stand; by 1873 sawmills were averaging 325,000 feet.²⁸ Still they could not keep up with the lumberjacks. In the early 1870s it was believed that Knapp, Stout, and Company of Menomonie on the Red Cedar, the Chippewa's main tributary, was the largest lumbering company in the world. It had over 115,000 acres of pine forests, employed over 2,000 men, owned over 6,000 acres of farmland to supply food for the lumber crews, and was producing each year fifty-five million board feet of lumber, twenty million laths and twenty million shingles.²⁹

Knapp, Stout and Company became one of the major logging firms on the Chippewa and Red Cedar rivers of Wisconsin. The company's sawmill at Reads Landing is pictured here as it appeared in 1870.

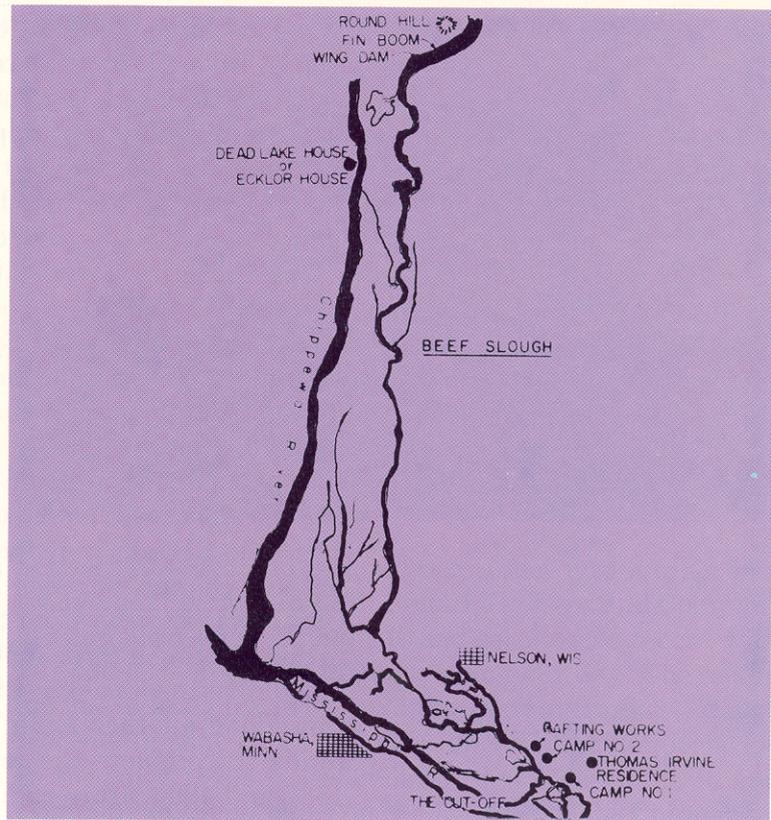


This lumber was rafted to retail yards on the Mississippi River. Rafts covered up to ten acres of water and held two to nine million board feet.³⁰ Getting these cumbersome rafts from the Chippewa River into the Mississippi was quite a feat, for at the mouth of the Chippewa the channel was blocked with sand and was only twelve to eighteen inches deep. Work on this obstruction by the Corps of Engineers aided the transfer of lumber out of the Chippewa. In 1877 the Corps began to build jetties at the mouth of the Chippewa. By 1880 it had solved the sandbar problem there and had begun to improve the fifty-seven miles of channel upstream to Eau Claire.³¹

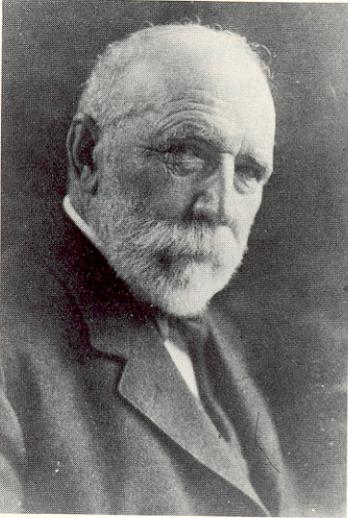
In the course of the Chippewa were many sloughs, islands and secondary channels, and five large sand banks. The Yellow Banks were five high bluffs located along the 57 miles of channel between Eau Claire and the mouth of the Chippewa. Erosion from them caused continual problems in maintaining a three-foot channel. In 1885 the Corps provided revetments along 4,969 feet and partial bank protection along another 3,145 feet, but never received enough funds to complete the remaining 14,575 feet.³² Between 1887 and 1900, army engineers spent \$200,641 improving and maintaining the main channel of the Chippewa.³³ Steamboats carrying freight upstream used this route until 1884 when the floating of loose logs and the running of rafted lumber prevented further commercial navigation. After this period the Corps only repaired the closing dams and wing dams that had been built. The shore protection project at Yellow Banks was never completed, and thus the channel and mouth of the river became shoaled with sand.

One of the reasons for the decrease of Corps activity on the Chippewa was the Beef Slough War. This controversy began in 1865 when lumber interests at Eau Claire discovered that speculators from eastern Wisconsin and Michigan were buying forest lands along the Chippewa to ensure a supply of pine for their sawmills downriver on the Mississippi. As a countermeasure local lumbermen organized and purchased the land around the mouth of Beef Slough, a secondary channel of the Chippewa River. Beef Slough, beginning some three miles below Durand and emptying into the Mississippi about twelve miles below the mouth of the Chippewa, was a beautiful waterway protected from fast currents and winds where logs could readily be stored, sorted and rafted. Engineers could not have designed a better backwater for the lumber industry.

Beef Slough is actually a secondary channel of the Chippewa River beginning about three miles below Durand, Wisconsin, and emptying into the Mississippi about twelve miles below the mouth of the Chippewa. It became a prime staging area for sorting logs and the center of controversy between local lumbermen and the large syndicates.



Outside interests knew that this channel was crucial to exporting vast quantities of logs. In 1867, organized as the Beef Slough Manufacturing, Booming, Log Driving and Transportation Company, they built a sheet boom at the entrance of the slough and a jam boom at its mouth.³⁴ Threatened with court action by local mill-owners who had a legislative franchise for developing the slough, the Beef Slough Company was forced to remove these structures. The company then asked the Wisconsin legislature in 1868 for a Beef Slough Charter which would allow it the same rights as local lumbermen. Eau Claire interests successfully defeated this act, after a hard-fought lobbying effort in which both sides used pressure tactics and illegal means. But the Beef Slough syndicate held the trump card. In the last days of the 1868 legislative session a Portage City Gas Light Company bill was passed with a rider which said that any single person who owned part of a franchise had an equal right to fulfill the charter of that franchise. James H. Bacon, who had an interest in the original Eau Claire lumbermen's charter, co-operated with the Beef Slough Company. Under Bacon's name the company built booms and began to operate a logging enterprise in the secondary channel.³⁵



Frederick Weyerhaeuser of Rock Island, Illinois, became one of the strongest business leaders in the lumber industry by purchasing timberland in Wisconsin and shipping the pine to his sawmills along the Mississippi.

The Eau Claire group next attempted a holding action by keeping all logs from the Chippewa River in their booms north of Eau Claire. They claimed lack of time to do the necessary sorting. Bacon, who retaliated by sending lumberjacks to cut the booms, was arrested. After a heated confrontation between local interests and outsiders, the 1870 legislature decided to authorize the free use of Beef Slough by the outside logging interests. This order did not disturb Eau Claire lumbermen, for by that time their holding action had forced the Beef Slough Company into bankruptcy.

When the western Wisconsin interests were preparing to celebrate a great victory, they were again outflanked, this time by a new general — Frederick Weyerhaeuser. This Rock Island sawmill operator, who had organized a new syndicate of Mississippi milling firms, in December, 1870, bought out the bankrupt Beef Slough Company and renamed it the Mississippi River Logging Company. The war was prolonged for another ten years. Eau Claire lumbermen attempted to break the power of this group through four separate court actions. First they attempted to have Beef Slough declared a navigable channel. Under the laws of Wisconsin and the United States, the storage of logs could be forbidden as an impediment to free navigation. The maneuver failed. In 1872 the Wisconsin legislature repealed the laws which protected navigation rights on secondary channels.

The second strategy of the Wisconsin lumber interests centered on the right to operate sheer booms. In 1868, Levi Pond and the Eau Claire Lumber Company had been granted a patent on a fin boom. This device consisted of a series of logs chained together, with rudders or fins attached to the bottoms of the logs. One man on shore could pull a rope and adjust the fins so that the boom would swing into the main channel and direct floating logs into Beef Slough. No permanent pilings were necessary and thus the commerce on the main channel could continue uninterrupted between log drives. Just when it appeared that the Wisconsin lumbermen would be able to stop Weyerhaeuser's group from using the fin boom, the Eau Claire Lumber Company relinquished its patent rights to the Mississippi River Logging Company. Though the reason for this action has never been explained, historian Robert Fries concluded that "fat royalties for the moment outweighed local patriotism."³⁶

A third attempt to curtail the growth of Weyerhaeuser's lumber interest was an injunction initiated by Thaddeus C. Pound of Chippewa Falls asking the Department of Justice to stop the "unlawful conduct" of the Mississippi River Logging Company in the operation of its booms, obstruction of river traffic and regulation of water levels. After a year of litigation in which much of the argument focused on the fact that the Corps of Engineers had begun improvements of the Chippewa River for free navigation, the court decided that the absence of specific congressional legislation regarding the floating of logs on the Chippewa River meant that no federal law had been violated. The same reasoning prevailed in Edward E. Heerman's lawsuit against the Weyerhaeuser company. Heerman, a steamboat operator, complained that loose logs belonging to the company blocked the channel, damaging his boats and interfering with regular steamboat service.³⁷

Finding it impossible to stop the Weyerhaeuser logs from leaving the state of Wisconsin, the Eau Claire lumbermen joined forces with the Mississippi Logging Company in 1880. Together they formed a large economic pool which controlled lumber processing in the whole Chippewa Valley.

TABLE 30
CHIPPEWA RIVER LUMBER LOCALLY PRODUCED

Year	Lumber	Laths	Shingles	Pickets
1881	342,887,000	64,787,000	121,437,000	1,880,000
1882	375,000,000	66,000,000	150,000,000	2,200,000
1883	269,094,203	83,643,500	129,754,000	1,497,948
1884	298,344,591	88,905,520	160,133,000	1,810,278
1885	374,138,443	95,992,900	195,880,220	75,000,000
1886	207,205,672	77,729,630	158,465,750	1,934,340
1887	186,826,521	64,725,580	130,516,200	3,023,235
1888	161,309,512	50,544,370	86,348,900	1,500,320
1889	158,928,294	50,487,355	112,053,075	2,244,786
1890	166,477,966	46,234,673	78,499,500	1,222,989
1891	152,040,386	107,841,850	48,700,210	1,258,850
1892	144,651,150	46,451,170	109,356,000	1,507,050
1893	159,180,534	43,938,210	108,774,500	1,940,525
1894	128,703,908	33,550,370	74,183,250	1,420,618
1895	130,117,213	29,928,099	69,718,000	581,705

From: Office of the Chief of Engineers
Annual Report, 1895, p. 2190.

TABLE 31
BEEF SLOUGH LOGS IN
BOARD FEET

1881	300,000,000
1882	350,000,000
1883	450,000,000
1884	534,674,176
1885	600,000,000
1886	465,000,000
1887	404,302,650
1888	542,437,000
1889	400,518,720
1890	606,992,790

From: Office of the Chief of Engineers
Annual Report, 1891, p. 2203;
Annual Report, 1892, p. 1836.

In the next nine years this group sent over five billion feet of logs through Beef Slough (see Table IV). But what the Chippewa River lumbermen were unable to accomplish through holding actions, legislative manipulation and litigation, the Corps of Engineers did temporarily in 1889 by refusing to dredge the blocked opening of Beef Slough. The Weyerhaeuser Mississippi River Logging Company then fought back. Defying the power of the Corps of Engineers, the company blew up a government dam at the entrance to West Newton Slough and moved its logging operations to that area on the Minnesota side of the Mississippi.³⁸

The Rock Island District engineer took the company to court, but a grand jury in La Crosse claimed it had no jurisdiction over the case. After two years of legal delays, the district engineer, Major Alexander Mackenzie, decided to drop the litigation. He had become frustrated over congressional indecision on how the rafting and logging industries should be regulated. It was clear that many members of Congress, especially representatives from Mississippi River Valley states, felt that logging was a form of navigation and thus had an equal right to river usage. The Rock Island office concluded that the dispute was between commercial interests on the river and any damages incurred should be solved in court actions between those groups.³⁹ By 1892 West Newton Slough was the largest staging area for sorting, storing and rafting lumber in the United States. At one time it held over 600 million feet of logs.

The over-all result of the Beef Slough controversy was that the main channel of the Chippewa River became an exclusive avenue for floating logs and all other commerce was chased from the river. The St. Paul office continued to maintain a three-foot channel until 1902, but spent little money after 1884 when steamboating and commercial traffic ceased. The West Newton works were operated until 1909. The following year the Weyerhaeuser companies began selling the cutover lands of the Chippewa Valley, the large sawmill at Chippewa Falls was shut down and the assets of the Mississippi River Logging Company were liquidated.

The St. Croix River

The St. Croix River has been under improvement by the Corps of Engineers for a longer continuous period than any other Wisconsin river. It has also been the most controversial. The river is 160 miles long, drains an area of about 8,000 square miles or five and one-half million acres in Wisconsin and Minnesota, and is divided into three natural segments.

The first twenty-five miles from the mouth at Prescott, Wisconsin, to Stillwater, Minnesota, is wide and placid and known as Lake St. Croix. The next twenty-seven-mile segment from Stillwater to the falls is narrow with multiple channels and contains the Dalles of the St. Croix. The portion of the river above the falls has never been improved and in 1968 this northern section was declared one of America's first wild and scenic rivers.

In the canoe era the St. Croix River, with portages to rivers flowing into Lake Superior, formed one of the natural transportation links between the Mississippi and the Great Lakes. Steamboats navigated the St. Croix beginning in 1838, as far upriver as the falls and the twin towns of St. Croix Falls, Wisconsin, and Taylors Falls, Minnesota. Periodically, during more than a century people have dreamed of building a canal to improve transportation beyond this point to Lake Superior. The Corps has been involved in six different studies for a canal route between Lake Superior and the Mississippi.

For seventy-five years (1839-1914) logging and lumbering interests dominated the river. Since that time water power, navigation and recreation have kept the river a busy inland tributary of the Mississippi.

In the first years of the lumber era on the St. Croix (1839-1856) small sawmills processed the logs into lumber and sent rafts of cut lumber downriver to market. During the second stage (1856-1890) logs were held and sorted at the Stillwater boom and sent downriver to large sawmills at Stillwater and on the Mississippi for processing. The final stage of lumbering (1890-1914) began with the building of Nevers Dam which allowed the industry to control both the shipment of logs and the flow of water downriver to the mills.



The Stillwater lumber mills became the largest manufacturers of lumber on the St. Croix River. The mill yard of the West Side Lumber Company is pictured at the height of production in 1899.

The first land sold at the area's first federal land office in St. Croix Falls went to James Purinton, a Maine lumberman, who bought pinelands around the Willow River above Hudson. The second parcel of land went to Orange Walker, Hiram Berkey, and Samuel Burkleo, three of the organizers of the Marine Lumber Company, which by 1840 was logging over 2,000 pines per year from the Kettle River for its sawmill at Marine Mills. By 1855 seventeen sawmills were buzzing along the lower St. Croix from Taylors Falls to Prescott. Rafting cut lumber down to St. Louis was no problem, and by 1855 the mill of Judd, Walker and Company, successor to the Marine Lumber Company, exported over two million board feet yearly. The company joined with other local lumbermen from Stillwater, Taylors Falls and Osceola in 1851 in organizing the St. Croix Boom Company. This firm's sorting and storage reservoir was located about six miles below Taylors Falls at Boom Island.⁴¹ Within a few years a larger boom near Stillwater took over its functions.

Between 1839 and 1914 lumberjacks cut over twelve billion feet of timber in the drainage area of this border river.

TABLE 32
LOG FEET CUT ON THE ST. CROIX RIVER

1839-48.....	122,500,000
1849-58.....	1,134,000,000
1859-68.....	1,598,000,000
1869-78.....	1,494,000,000
1879-88.....	2,606,000,000
1889-98.....	3,439,000,000
Total: 10,393,500,000	

From: Minnesota Historical *Collections*, IX, 361-62

The largest of the white pine trees, about 175 feet in height, were cut in 1879. The peak year of logging occurred in 1890 when 452 million board feet of logs were floated out of the Kettle, Snake, Namekagon, Apple and Yellow rivers, the main tributaries of the St. Croix.⁴⁰



Many of the white pines in Minnesota and Wisconsin were huge, old trees. This photograph shows a white pine log six feet and six inches in diameter cut in 1906 from a tree 100 feet high. It took 420 years for this giant to grow.

The vast timber resources of the St. Croix soon attracted eastern capital and upper Mississippi River lumbermen. In 1856 Schulenburg and Boeckeler from St. Louis, Hershey, Staples, and Company from Maine, and other Stillwater lumbermen known as the "Minnesota marauders" built a large boom above Stillwater. The Stillwater boom became an immense institution which controlled the distribution of all logs coming down the St. Croix. It was a sore point for Wisconsin residents who claimed that badger state logs were filling the pockets of Minnesota gophers.

By 1884 only one sawmill was in operation on the river above Stillwater, and the mills at Stillwater could not handle the quantity of logs that came down the river. Millions of excess logs were sorted by a huge lumbering syndicate and floated out of the St. Croix to Mississippi



In 1860 the St. Croix boom averaged fifty to sixty million feet of lumber a year. By 1886, when this picture was taken, over 300 million feet of logs were floated through this staging area annually.

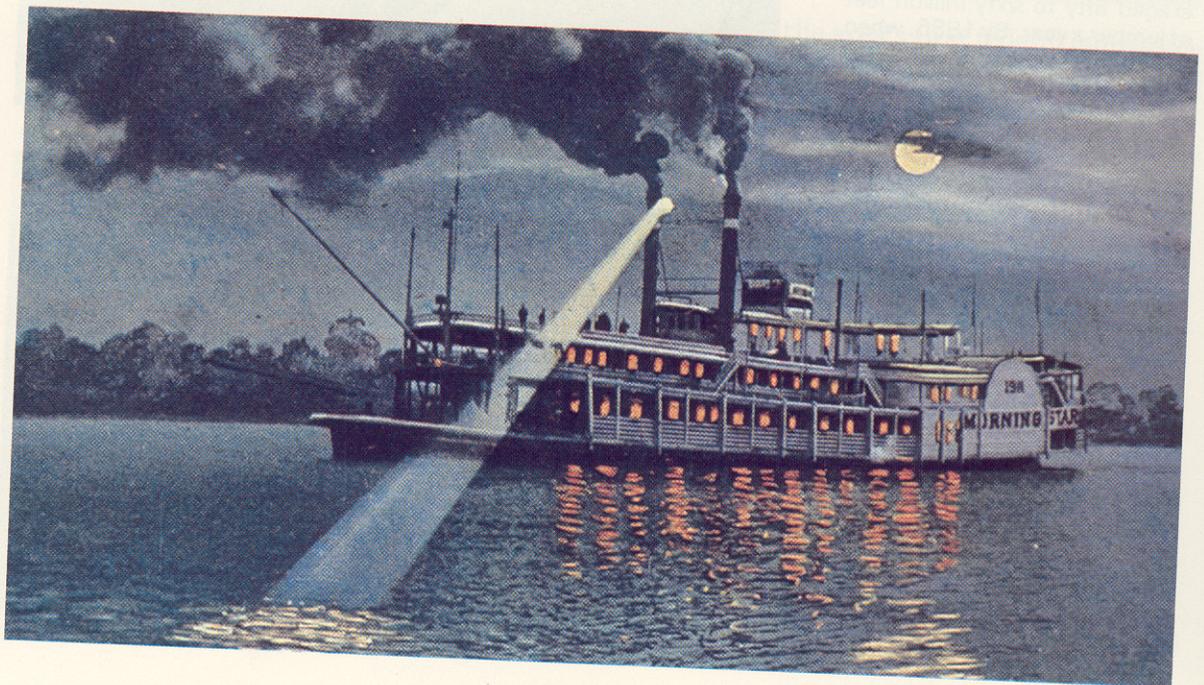


The Hersey and Bean Lumber Company at Stillwater, Minnesota, set high standards for productivity and efficiency. This 1885 photograph shows that the railroads were an important factor in the distribution of sawed lumber.

River sawmills at Winona, Davenport, Muscatine, Clinton, Keokuk, Rock Island, Dubuque, Quincy and Hannibal (see Table 32).

The boom above Stillwater and the rafting of lumber on Lake St. Croix caused problems for the steamboat passenger and packet businesses that served the small upriver communities. In 1838 the first steamer, the "Palmyra," came up the St. Croix, and by 1852 the "Queen of the Yellow Banks" had begun regular service. In 1868 William F. Davidson, who eventually came to dominate upper Mississippi River transportation, had the "Nellie Kent," a 112-foot stern-wheeler, built at the Osceola shipyards. The "Nellie Kent" became noted for her reliable service on the St. Croix. But she was not the only boat. In 1869, a year before the first railroad touched the St. Croix, 270 steamboats made the journey up the fifty-three miles to Taylors Falls. In 1875 St. Croix businessmen launched the "G. B. Knapp" after organizing a "People's Line" to compete with Davidson's "Nellie Kent." The logging companies also had their steamboats on the river. There were eight in 1878, seventy-seven in 1882, and by 1891 there were 130 steamboats engaged in rafting and towing logs on the St. Croix. A single tow of rafts by a steamboat equaled the work of forty-one locomotives pulling 800 cars in a train three and a half miles long. After the end of logging in 1914 only the "Morning Star" made a regular weekly trip up the St. Croix.⁴²

The "Morning Star" made weekly trips up the St. Croix River prior to World War I.



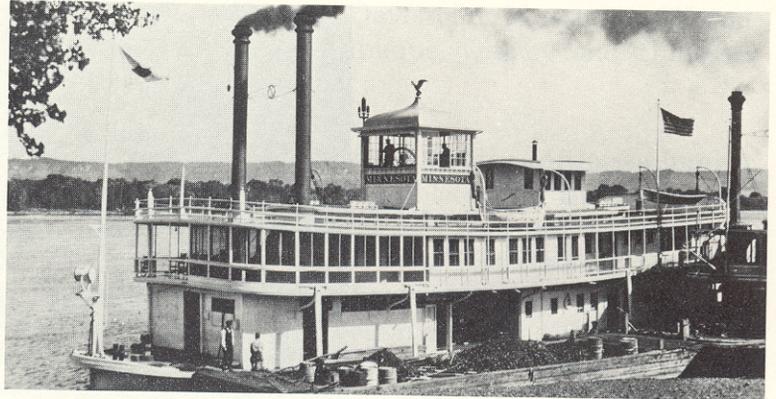
The excursion boat business on the St. Croix River conflicted with the logging companies' shipping procedures. As pictured here, the "Dalles" was having some difficulty making its way to Taylors Falls, Minnesota.



After the log booms were well established, in 1874 and 1875, the Corps of Engineers was ordered to survey the river. Major Farquhar recommended that a four-foot channel should be developed and maintained below Stillwater and a two and one-half-foot channel upriver from there.⁴³ Congress provided funds in 1878 and by 1882 the Corps had removed snags, dug out sunken logs, cut overhanging trees, built revetments, closed side channels, dredged out the main sandbars, pulled out stumps, hauled away boulders, pulled up cribs, blasted rocks and constructed dikes, spur dams and wing dams.⁴⁴ Corps reports for this period all noted that the main obstructions to free navigation were the log booms and the free floating of logs. The result was a "conflict of interests" between freight packets and lumber companies. One log jam in 1883 bottled up the river for fifty-seven days.⁴⁵ Regular packet and passenger service declined and the rivalry between lumber interests at Stillwater and St. Croix communities upriver intensified.

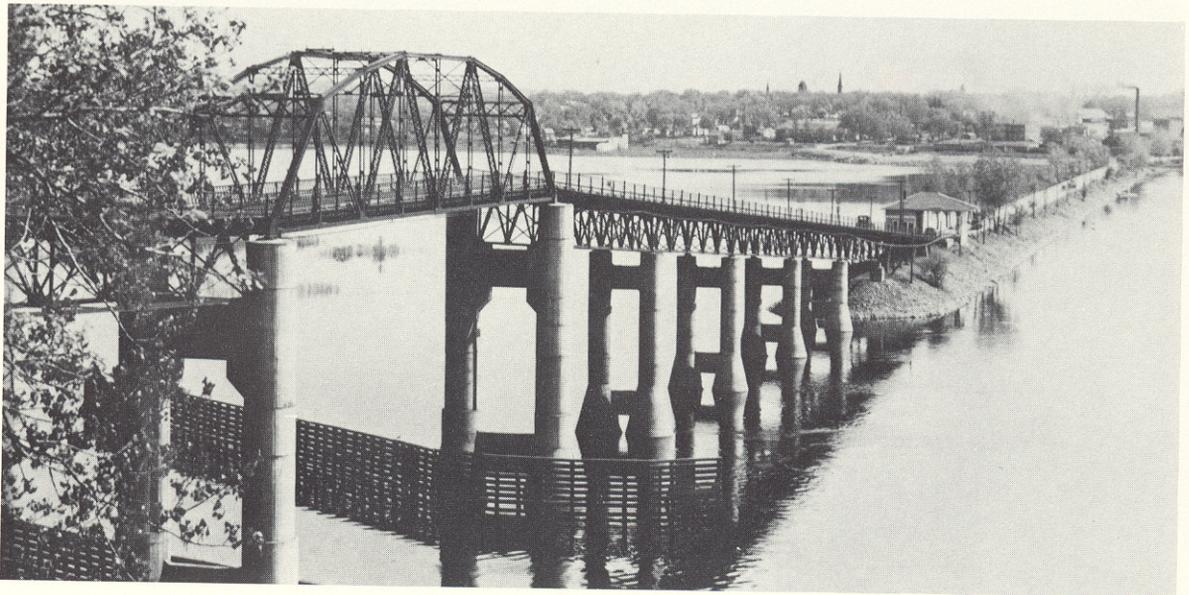
Another serious threat to navigation came when the Hudson bridge across the St. Croix was built. Both Stillwater and Hudson, Wisconsin, hoped that the newly formed Western Wisconsin Railroad would pick their city as its crossing point on the St. Croix. Hudson won. The *Hudson Star and Times* claimed that Stillwater did not get the prize because of the "natural perversity and unhal- lowed ambition of their wicked hearts."⁴⁶ No love was lost between the two communities. In 1871 when construc- tion crews began to sink bridge pilings into the river,

The "Minnesota" served as the flagship in the "Battle of the Piles" between steamboat pilots and railroad interests building the bridge at Hudson, Wisconsin.



trouble erupted. The packet steamer "Wyman X," the stern-wheel towboat "Mobile Whitmore" with a raft of logs and the "Imperial" with barges of wheat all had problems getting through the pilings, which were less than 100 feet apart, although the Stillwater lumbermen had requested a 200-foot channel opening. When the Washington County sheriff arrived, the pile-driving crew ignored his warnings. On July 6, Stillwater prepared for the "Battle of the Piles."⁴⁷ A fleet consisting of the "G. B. Knapp," the "Minnesota," the "Swallow," the "Louisville," and the "Brother Jonathan" was assembled. Under cover of night the ships left home port, and before daybreak they not only had pulled up about 100 piles, but had captured the pile-driver and its crew. After this victory, representatives of Hudson and Stillwater met on the deck of the "Minnesota" to negotiate an "unconditional surrender." In the terms of peace was provision for a 140-foot span on either side of the draw pier for the passage of rafts.

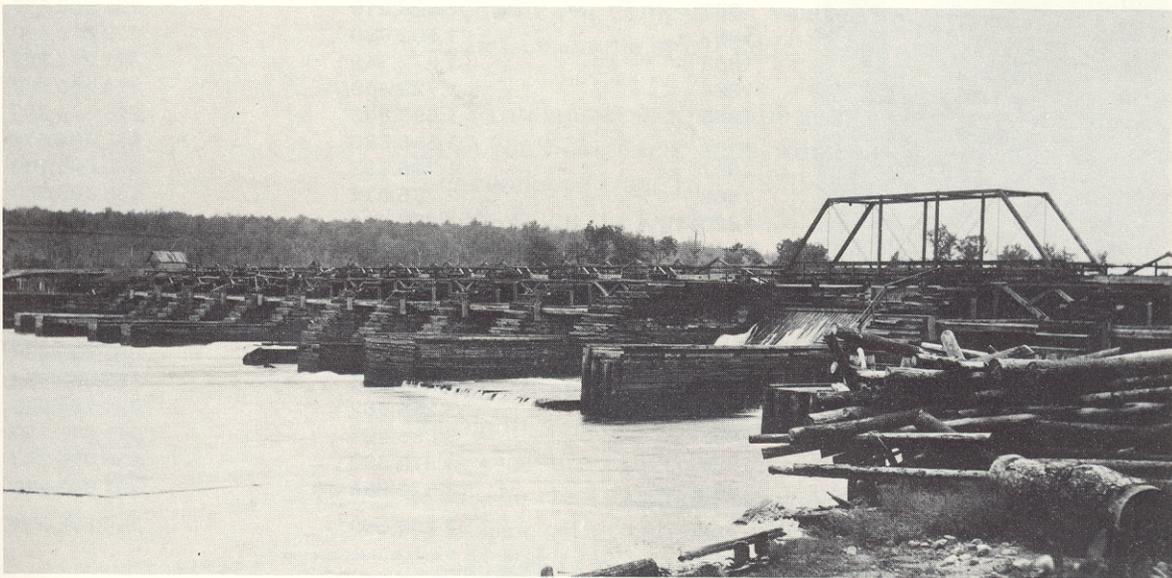
Stillwater residents feared that the toll bridge at Hudson would be a barrier to the proposed Duluth-St. Croix-New Orleans waterway. This photograph was taken in 1935.



This was not the only time that bridge construction caused conflict between these two communities. In 1912, Hudson began construction of a highway bridge over the St. Croix, after conducting the required public hearings. No one from Stillwater bothered to attend these meetings. After the bridge piers were in place, Stillwater made a formal protest and the Corps district engineer was called in to mediate. Some minor changes were made in the design and construction continued, but Lieutenant Colonel Shunk observed that the real reason for the protest was that Stillwater expected a Gulf-to-Great Lakes waterway through the St. Croix Valley to be developed in the near future and feared that the Hudson bridge would be "an obstacle to this enterprise."⁴⁸

The hottest debate between Stillwater and other St. Croix communities occurred over Nevers Dam, the capstone of logging history on the St. Croix.⁴⁹ Nevers Dam was one of 331 logging dams that were authorized by the state of Wisconsin (but not by the Corps) between 1850 and 1900. It was built of pilings in the winter of 1889-90 about eleven miles upstream from Taylors Falls by the St. Croix Lumbermen's Dam and Boom Company. It was constructed after St. Croix Valley residents protested an extension of the Stillwater boom company's charter, which expired in 1889. The Stillwater boom had effectively blocked traffic for thirty years and had had an adverse effect upon the growth and development of all villages other than Stillwater. The boom could only

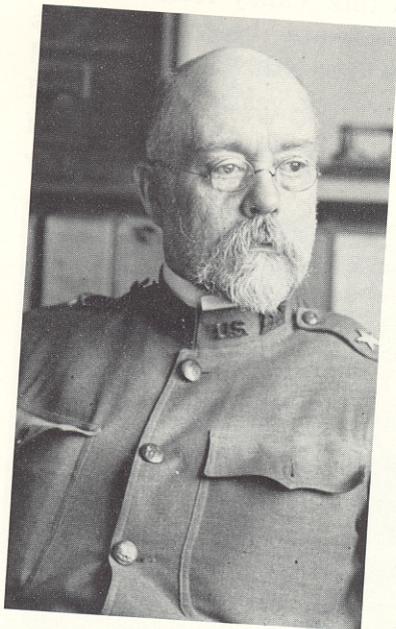
This photograph of Nevers Dam taken from the Wisconsin side in 1897. As one can see, it was not the most attractive structure built by man.



**TABLE 33
RAFTED LOGS TOWED
OUT OF THE
ST. CROIX RIVER**
Totals in Board Feet

1878	70,000,000
1879	117,000,000
1880	200,000,000
1881	185,000,000
1882	130,000,000
1883	108,000,000
1884	175,000,000
1885	150,000,000
1886	115,000,000
1887	175,000,000
1888	136,000,000
1889	150,000,000
1890	250,000,000
1891	209,000,000
1892	250,000,000
1893	160,000,000
1894	150,000,000
1895	213,000,000
1896	168,300,000
1897	179,228,000
1898	243,950,000
1899	263,563,920

From: Office of the Chief of Engineers.
Annual Report, 1900, p. 2811.



Major Frederic V. Abbot, St. Paul District engineer between 1897 and 1900, had to negotiate a settlement of the Nevers Dam controversy.

hold between eighteen and thirty million feet of logs, depending on the level of the river. In 1889 over 200 million feet of logs reached the boom between June 15 and July 15 (see Table 34). The river was jammed, but the logs were not released from the boom because log sorting depended upon a good current. The current keeps the logs straight and greatly aids the construction of rafts.

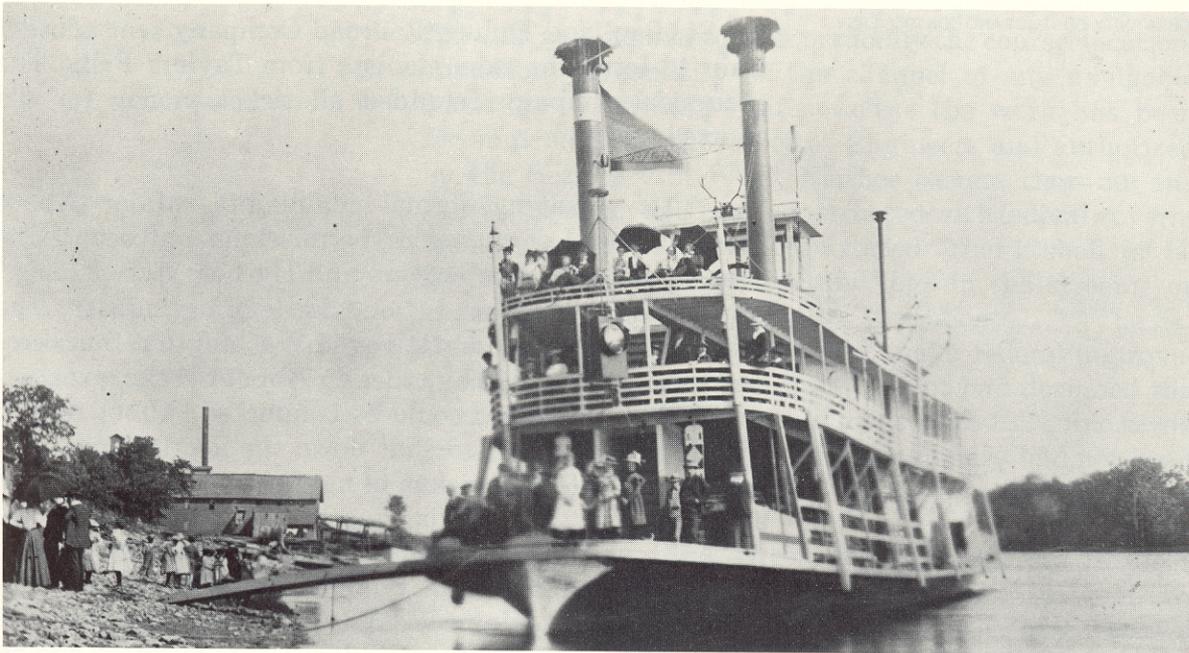
The fact that most of the logs left the St. Croix Valley irritated local residents, especially Wisconsin taxpayers who saw the forest wealth of their state floating away with little compensation. When Nevers Dam was built to control the flow of logs to Stillwater, it also controlled the flow of water. This upset riparian communities even further, because they no longer had a natural flow of water going by their villages.

Matters came to a head in July, 1898. The steamer "Park Bluff" was unable to negotiate the channel above

**TABLE 34 GROWTH OF LOGGING BUSINESS ON THE
ST. CROIX RIVER**

Year	Logs Scaled Number of Logs	Sawn Lumber Number of Feet
1875		
1876	782,685	121,389,720
1877	898,340	153,252,000
1878	765,004	130,540,890
1879	810,320	132,735,870
1880	1,146,850	201,763,500
1881	1,178,940	201,440,800
1882	1,528,210	231,500,500
1883	1,652,890	273,810,400
1884	1,672,359	271,272,800
1885	1,723,406	274,350,600
1886	1,590,865	225,540,800
1887	1,556,828	191,454,500
1888	1,726,893	270,060,100
1889	2,256,872	365,480,300
1890	1,987,681	262,385,980
1891	3,468,309	452,360,890
1892	2,520,387	315,180,700
1893	3,361,786	436,899,770
1894	3,030,885	359,468,720
1895	2,496,260	281,470,400
1896	3,441,991	353,062,850
1897	3,258,662	321,764,530
1898	3,086,704	311,615,170
1899	3,214,690	336,476,740
	3,676,958	391,083,770
	3,155,663*	354,938,354*

*Average since 1890, when Nevers Dam was first operated.
From: Minnesota Historical Collections, X, 674.



Captain John A. Kent of the "Vernie Mack," pictured here at Prescott, Wisconsin, in the 1890's, played a prominent role in pushing for navigational rights on the log-jammed St. Croix River.

Stillwater because of insufficient water, and a formal complaint was made to the district engineer, Major Abbot.⁵⁰ Abbot brought together representatives of the St. Croix Lumbermen's Dam and Boom Company and the major excursion carrier, the Interstate Park Navigation Company, and on April 3, 1899, they formed an agreement for mutual use of the waterway. The loggers agreed to sluice logs only once a week and to shut down the dam after 1:00 P.M. on Sundays for a period of forty-eight hours. A special agent, agreeable to both parties, was hired by the dam company to record water levels and report to Abbot. All complaints were to be processed through the district engineer's office.⁵¹

Problems arose immediately. Two of the most popular times for boat excursions were on Decoration Day and Independence Day. In 1899, both of these days fell during periods when the loggers had control of the river. When the excursion company asked the dam company to modify their agreement, the latter refused. On June 7, a large excursion had to be cancelled when the river at the Dalles was jammed with logs. Later that month 500 Twin Cities patrons took a special train for Taylors Falls and then boarded Captain John A. Kent's boat the "Vernie Mack" for a pleasure ride to Stillwater. After going a few miles down the river the boat went aground because water had been shut off at the dam. The train which waited for the passengers in Stillwater returned empty to St. Paul, and

the St. Paul and Duluth Railroad Company sent another train to fetch the excursionists from Taylors Falls. The excursion company refunded all ticket money for the aborted trip.⁵²

After receiving formal complaints, Major Abbot asked the chief of engineers' permission to prosecute the loggers under the new Rivers and Harbors Act of 1899.⁵³ Threatened with court action, the logging industry put pressure on its representatives in Washington; the secretary of war responded by ordering Abbot to take no action until an investigation could be conducted. Abbot replied that he did not plan to shut down the logging industry, but only to enforce freedom of navigation on the river. He explained that the crucial question was whether a big, powerful, and wealthy syndicate could completely ignore the livelihood of small businessmen. Later in July Brigadier General John W. Wilson reviewed the case and told Abbot that logging was a legitimate business and he should provide for the rights of others to use the St. Croix.⁵⁴ These instructions were ambiguous and Abbot wrote for clarification. Lieutenant Colonel Alexander Mackenzie wrote back that the law of March 3, 1899, was very specific and the district engineer had the authority to enforce it. Abbot was informed that "to what extent this power shall be exercised must be left to the individual judgment of each officer." Mackenzie warned Abbot, however, that the secretary of war might ask the Department of Justice to drop the case if he felt that the district engineer was abusing his authority.⁵⁵

Major Abbot had informed the president of the St. Croix Lumbermen's Dam and Boom Company, William Sauntry, in August of 1898 that he did not wish to initiate litigation because he felt that the court might force the company to remove its dam which had not been authorized by the Corps.⁵⁶ The arrogant attitude of the lumbermen in ignoring the compromise agreement Abbot had negotiated changed the district engineer's position. Abbot sent a letter to 180 individuals and corporations involved informing them of a public hearing in January, 1900. At that time he proposed to gather information about violations of the law on the St. Croix for the purpose of deciding whether "suits should be inaugurated in United States Courts." Two sections of the Rivers and Harbors Act of March 3, 1899, were particularly relevant. Section ten stated that it was "not lawful to excavate, or

fill, or in any manner to alter or modify the course, location, condition, or capacity of the channel of any navigable water of the United States unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War." Neither Nevers Dam nor the Stillwater boom had been constructed with federal government approval. Section fifteen stated "That it shall not be lawful to float loose timber and logs in the streams or channels actually navigated by steamboats..."⁵⁷ The St. Croix had been a navigable river under federal improvement for twenty years. In fact, Abbot had designed the dredge "St. Croix" which could move 64 to 132 cubic yards of sand and gravel a day.⁵⁸ This machinery had not been built just to clear the channel for logging operations.

Sections ten and fifteen of the Rivers and Harbors Act of 1899 had been added by Senator Cushman K. Davis of Minnesota because the Big Sandy and Kanawa rivers in West Virginia had been continually blocked by loggers and miners.⁵⁹ The law, however, described exactly the problems on the St. Croix River and directly challenged the total control of the waterway assumed by lumber interests. Abbot, fearing that the hearing would produce some heated discussions, asked St. Paul's Mayor Andrew Kiefer for police protection.⁶⁰

The hearings opened in St. Paul on January 18. First to speak were representatives of St. Croix Valley villages. William Blanding of St. Croix Falls began by noting that the corporate interests had driven small business from the river. He labeled this action a "nuisance (sic) and outrageous usurpation of the rights of the general public."⁶¹ Sawmills had been shut down for lack of logs, development of power resources had been suppressed, packet and passenger trade had been destroyed and consequently the growth of towns and villages had been halted. For Blanding, the slipshod log pile construction of Nevers Dam was a symbol of the transient nature of the lumbering business, whose main purpose was to exploit the resources of the valley and then leave. The only hope for the future, according to Blanding, was the exhaustion of timber supplies forcing the large corporations to leave the St. Croix. He concluded, "When like a wasting pestilence they have passed over the land and the coming fire has destroyed all traces of their footsteps and the overtaxed waters of the rivers and its tributaries once more flow free to all—then perhaps this dam company ridden country may be allowed



This revealing 1920 photograph shows the burnt-over region left by the logging firms when they pulled out of Wisconsin. Note the remains of an old logging dam and sluiceway in the upper portion of the picture.

to make use of what natural resources these greedy tyrants have left in it.”⁶²

Frank B. Dorothy of St. Croix Falls presented Major Abbot a petition with over 100 signatures that asked for the “free and unobstructed passage” of the river.⁶³ William H. C. Folsom of Taylors Falls recalled the section of the Northwest Ordinance that promised Americans the full and free navigation of all inland waters. Folsom’s life-span paralleled the growth of the lumber industry on the St. Croix and he expressed a fear of taking these matters to court where logging attorneys were apt to win lawsuits. George W. Seymour pointed out the irony of the boom company’s charter, which said that the corporation must improve the river. The testimony of these valley residents was filled with nostalgia and bitterness. They appreciated the lore of lumbering, but hated the control of it by outside forces which had done nothing to improve the St. Croix hinterland, having instead logged away its timber and set fire to the remaining brush.



G. H. Hazzard, pictured here in 1889, served as the commissioner of Interstate Park at St. Croix Falls and was an advocate of an open channel on the St. Croix river for the excursion business.

George H. Hazzard, the commissioner of Interstate Park located at Taylors Falls, spoke often during the deliberations. The park had been created in 1895 and was already famous in the region for its unique geological formations and natural beauty. Hazzard, who had spent twenty years working on steamboats along the St. Croix, was a promoter of excursion business and a strong supporter of local industry. He expressed the hope that a free channel would attract flour milling, stone quarrying and brick manufacture. He was also concerned about the continued need for government improvements along the river. Hazzard called attention to the problem of sunken logs in the channel. William H. C. Folsom estimated that over 78,000 abandoned logs had become lodged in the river bed.

Steamboat captains William Kent, Oscar Knapp, D. A. McDonald, and S. R. VanSant all testified that Nevers Dam could be used to improve navigation, but under the current system of flushing, it was destroying commerce by creating gravel bars in the channel. As a group, however, the steamboat captains were realistic men. They doubted that the packet business would ever return. The six railroads operating in the valley provided much more efficient service. Actually, the only packets still running with some regularity on the whole inland water system from St. Louis to St. Paul were the two or three steamboats of the Diamond Jo Line.⁶⁴

After the village residents, park representatives and steamboat captains had a chance to testify, C. F. Stone spoke for the railroads. At this time the only railroad interest in the river stemmed from the excursion business. In 1897 the St. Paul and Duluth Railroad began to run excursions from the Twin Cities by railroad to Taylors Falls, downriver to Stillwater and return by train from there. During that season they grossed \$5,418 and expected to double this sum the next year. However, in 1898 because of low water in the channel they were only able to run tours on an irregular basis between May 29 and July 4. The total profit collected in 1898 was only \$1,340. Tickets sold for \$1.50 and the competition with excursion trains to White Bear Lake, Lake Minnetonka and other areas was very keen. Stone felt that a 117-mile trip on railroad and steamboat for under one and one-half cents a mile was a bargain. After Major Abbot's compromise of 1899, railroad excursions were resumed. The company

grossed \$2,893 in that year, although it was forced to abort a number of excursions because of dam company action in cutting off the flow of water. The railroads then terminated the excursion business, but expressed a willingness to reinstate the service if shallow draft boats could be built and if the dam company would provide enough water for the boats to operate.⁶⁵

The lumber industry was represented at the hearing by its attorney, Newel Clapp of St. Paul. Clapp himself appeared to be in a conciliatory mood. He knew that the law, if enforced, would drive all of his clients out of the St. Croix. Letters from C. Lamb and Sons of Clinton, Iowa, Weyerhaeuser and Dankman of Rock Island, Lindsay and Phelps of Davenport, Rand Lumber of Burlington, Iowa, and Standard Lumber of Dubuque, as well as Empire Lumber and Laird, Norton of Winona all claimed that the law was absurd. Their argument was based on "bigness." A large labor force, a huge investment in land, transportation, machinery and buildings, a national need for lumber, the well-being of upper Mississippi towns, the legality of state charters for booms and dams and the lumber companies' long-established dominance of Wisconsin river systems were cited as justification for continuing the operation of Nevers Dam, the St. Croix boom and the free floating of logs.⁶⁶

T. D. Wilson, an innkeeper at Osceola, responded to the argument of size by stating, "Although I have only a few dollars in my hotel, that is no reason why I should be stepped on and bound down by somebody who says that their interests are greater than mine."⁶⁷ He warned the residents of Stillwater that they should diversify their industry, for the pine forests would soon be gone. Wilson showed little sympathy for upper Mississippi River communities that were built on the supply of Wisconsin logs. Let them relocate in Wisconsin, was his solution. Frank Dorothy told of a firm that had once planned to expend over \$250,000 to develop a paper mill at St. Croix Falls, but backed out when it learned that Nevers Dam controlled the flow of water. The company did not wish to waste money in a lawsuit, he claimed.

A few days after the hearing, Major Abbot announced that he would allow joint use of the river during the month of June, but would ban logs from the river during July and August.⁶⁸ The lumbermen objected strongly to this solution. Then Abbot met with Frederick Weyerhaeuser

and others to work out a compromise which granted the exclusive use of the St. Croix to steamboats on Decoration Day and Independence Day, and in the month of August. Joint use of the river would be the rule during June and the lumbermen could float logs freely after the first of September.⁶⁹ Abbot warned that he would "vigorously push suits against any parties infringing the provisions of Sections ten and fifteen of the Act of Congress approved March 3, 1899."

Though Weyerhaeuser advised his colleagues to accept Major Abbot's plan, the lumber interests in Stillwater were greatly disturbed and called a mass meeting for February 11. William Sauntry threatened to shut down the St. Croix boom. The boom operator, George A. Lammers, estimated that only about one-fourth of the logs cut would get to market under Abbot's plan. Byron J. Mosier, Samuel McClure, John O'Brien and Eugene O'Neal expected a "great calamity" to befall the city of Stillwater with its eight sawmills employing about 2,500 men.⁷⁰ At the mass meeting it was decided to send Otis Staples, Senator Ernest L. Hospes, and lawyer Newel Clapp to Washington to appeal Abbot's decision.⁷¹

While this group was in Washington talking to Lieutenant Colonel Mackenzie and Chairman Theodore E. Burton of the Rivers and Harbors Committee, the citizens of St. Croix Falls and Taylors Falls held another meeting. They made a long list of their complaints against the lumbering industry and voted full support of Major Abbot.⁷² Cutting the exportation of logs to less than 200 million a year was viewed as a welcome step toward conservation. The *Taylors Falls Journal* said that the monopoly had reigned long enough and the *Osceola Sun* commented that "If there were less Stillwater and fewer dam boom companies there would be a more equitable distribution of enterprise and a greater and more prosperous growth in the upper valley."⁷³

Congress stepped into the dispute on May 9, 1900, by eliminating the prohibition against floating loose timber and logs contained in the act of March 3, 1899. The secretary of war was given power to establish regulations for logging on individual waterways. Thus, on June 30, 1900, Chief of Engineers Wilson modified Major Abbot's regulations by allowing the lumbermen to sluice logs whenever they wished as long as they did not jam the

main channel.⁷⁴ This decision caused more problems for Abbot.

On July 18, Representative Frederick C. Stevens asked the chief of engineers to further modify the regulations because drought conditions in July had shut down the driving of logs.⁷⁵ Major Abbot investigated this condition and reported to General Wilson on August 1 that the cause of the lack of logs was not the drought, but the spirit of non-compliance on the part of the lumbermen.⁷⁶ When on July 16 the logging dam cut off the water at the time an excursion boat was loaded with ladies from the Helping Hand Society of the Methodist Episcopal Church, the boat captain, Oscar F. Knapp, lost his temper. It was the fourth time such a trip had been abruptly terminated by lumbermen since Abbot had issued his new regulations. Hazzard wrote to Abbot that dynamite was a possible answer.⁷⁷ It had been used as a solution a month earlier along the Snake River, a tributary of the St. Croix. There a group of farmers, with fifty pounds of dynamite, destroyed "in broad daylight" a logging dam that had been flooding their property.⁷⁸

Major Abbot had argued with General Wilson that the regulations should not be modified, for one concession would lead to another. The district engineer feared "the power of the great money force concentrated in their hands."⁷⁹ Major Curtis D. Townsend, the Rock Island District engineer, wrote that the lumbermen were trying to enlist his help in modifying the regulations.⁸⁰ Abbot's pleas to the chief's office were not successful. He was replaced during the summer of 1900 as district engineer and his regulations were modified in 1901, 1904 and 1907 to accommodate the lumbering industry.⁸¹ From 1898 to 1907 the Corps spent \$28,846 on dredging activities between Stillwater and the falls but the continual sluicing of logs quickly destroyed these attempts to provide a navigable channel.⁸²

The controversy did not lessen during the declining years of the lumber industry, but the focus changed from water supply to the problem of sunken logs after a power dam was built at St. Croix Falls in 1905. On November 20, 1907, a public hearing was held at Taylors Falls to consider this nuisance. During a heated discussion "which made it perfectly clear that the river was badly obstructed by sunken logs" it was also made "perfectly clear" that

This photograph taken in 1900 at the site of the present Northern States Power Company dam shows the rushing of water from the open gates of Nevers Dam.



The same scene on the St. Croix River at the site of the Northern States Power Company dam shows the river bed with the gates of Nevers Dam closed.



the St. Croix Lumbermen's Dam and Boom Company was doing nothing at all about the situation. The dam and boom company's lawyer, M. E. Sullivan, disclaimed all responsibility for sunken logs. He reminded others that the boom company never owned any logs, but only stored and sorted them for others. Some of the logs had been in the river for over fifty years.⁸³

The St. Croix Log Lifting Company was chartered by the state of Minnesota with the exclusive right to remove logs. This company and the dam and boom company had the same owners and administrative leaders. It had removed 1,200,000 feet of lumber in 1907, but not from the main channel. It was taking those logs easiest to get out, usually near the shoreline. Major Shunk estimated that it would take many years before the Log Lifting

Company ever started on the sunken channel logs.⁸⁴ He was right. Log removal was still going on in 1921. Each year the logs increased in value as wood became more scarce. After the lumbermen completely abandoned the river in the 1920s the Corps began to remove the remaining obstructions. Between 1931 and 1940 it pulled an additional 6,219 log snags out of the St. Croix.

By 1908 the quantity of sunken logs made flushing necessary. Numerous bars had collected around sunken logs, forming shoals in the main channel and creating many minor channels so that logs could no longer float freely on the river. The flushing system itself added to the erosion of the river channel and increased the size and number of sloughs and secondary channels. The district engineer reported in 1908 that the St. Croix "sometimes ceases to flow below the dam and the river becomes a series of pools separated by dry bars." Dredging by the "St. Croix" would not help, for every time the lumbermen flushed the river "a mass of sediment is carried down, and is more likely than not to be deposited in the dredged cuts."⁸⁵ Thus the Corps of Engineers did not attempt improvements on the St. Croix between 1907 and 1922. However, in the succeeding fifty years, 1,711,616 yards of sediment were removed from the river. Much of it was from three locations: the Hudson bar, the Catfish bar, and the mouth of the Kinnickinnic River. Most of this work aided the recreational interests along the lower St. Croix, which has now become flooded with water skiers, power boats, sailing vessels and yachts every weekend. Pleasure-seekers have taken the place of logs in jamming the channel. The major commercial enterprise is the shipment of coal to the Northern States Power Company generating plant at Bayport, Minnesota. The channel to Stillwater, first set at four feet in 1878, was deepened to six feet in 1927, and increased to nine feet in 1935 to accommodate Mississippi River barges, such as the ones now going to Bayport.⁸⁶

The only commercial harbor that has been improved on the St. Croix is at Stillwater. Afton attempted to solicit Corps aid in developing a harbor in 1908, but the lack of any established industry except berry-picking caused the Corps to decline any assistance.⁸⁷ A small boat harbor was designed in 1950 for Hudson and \$215,400 was appropriated for its construction, but twenty-six years later the city still had not fulfilled the local requirements to permit construction.⁸⁸

For a canoeist, the St. Croix is indeed a 'wild river'



The St. Croix River today is still jammed with special interests which are a cause of concern for those who must negotiate regulations.

Hopes for commercial success have not been based solely on local industry. Every generation of St. Croix residents has renewed the Superior-Mississippi canal dream. Politicians since Ignatius Donnelly have made this one of their unfulfilled campaign promises. After the Civil War Donnelly pushed for a waterway from the Twin Cities to Duluth.⁸⁹ He relied upon a Corps of Engineers report of October, 1869, in which Franklin Cook suggested that an all-water commercial barge route from Duluth down the St. Louis River to Sandy Lake and then into the Mississippi to Minneapolis might be feasible.⁹⁰ In 1894 Congress appropriated \$10,000 to fund a survey for such a slack-water canal. Three routes were considered: via the St. Louis River and Sandy Lake; via the Nemadji, Kettle and St. Croix rivers; and a Brule-St. Croix River route.⁹¹ A fourth alternative along the White River into the Namekagon and then into the St. Croix was eliminated before field parties were sent out, because of its length and height. The Brule-St. Croix River route was given first priority. The proposal was to build a canal 210 miles long with twenty-four hydraulic lifts to raise boats 767 feet. The estimated cost was \$7,050,000 for a canal eighty feet wide by seven feet deep. This would enable boats to travel from Allouez Bay at Duluth and Superior, all the way to the Gulf of Mexico.⁹²

Major Clinton B. Sears opposed the building of such a canal. Not only was the original cost very high, but the annual operation and maintenance was estimated at

\$350,000. Sears noted that the competition was well developed, since four major railroads ran between Duluth and Minneapolis. This was not an enterprise, according to Sears, that should be financed by the federal government.⁹³

Between 1909 and 1915, when the Hudson bridge was under construction, a second generation of St. Croix Valley residents requested reconsideration of the canal project. In 1912 the Corps made a new study of the project. This time a special board of engineers consisting of Lieutenant Colonel Charles Potter, Lieutenant Colonel Francis Shunk, and Major Ernest D. Peek held public hearings and reviewed the shippers' arguments that such a project would save four and a half million dollars a year in transportation costs, and over one million dollars could be gained annually by the development of water power on the canal. The shippers favored, instead of the Brule-St. Croix route, a canal starting at the east end of Allouez Bay and following the Amnicon and Moose Rivers to the St. Croix.⁹⁴ The board of engineers concluded not only that an inadequate supply of water existed for such a barge canal, but that the route was "inadvisable, infeasible and impractical."⁹⁵ At this point the states of Minnesota and Wisconsin formed separate Superior and Mississippi Canal Commissions and appealed the special board of engineers' decision.

In order to make a knowledgeable appeal, proponents of the canal attempted to obtain a copy of the board of engineers' report. Lieutenant Colonel Potter would not release it, but did allow F. N. Stacy of the Minnesota State Railroad and Warehouse Commission an opportunity to come to his office and read the report. Stacy prevailed upon Potter to allow him to take a copy home for closer study. He promised to treat it as a private document. A few days later Potter learned that the report was in the hands of the Government Printing Office and was authorized for publication by the United States House of Representatives! Potter wrote to Stacy that "the English language is inadequate to express my feelings in this matter."⁹⁶ A public hearing on the appeal was held on June 30, 1914, and Governor Adolph O. Eberhart, Senator Knute Nelson, Representatives George R. Smith and Charles R. Davis, and State Senator George R. Sullivan all declared their support for an alternative transportation system that would reduce railroad rates from the Twin Cities to Duluth. The board stood behind its earlier



Jeno F. Paulucci, a Duluth businessman, has been a strong advocate of an artificial waterway from Lake Superior to the Mississippi utilizing the St. Croix flowage.

decision that the Brule-St. Croix route was more favorable because it would require twenty fewer locks, had much more water, would be easier to construct, served a much larger local population and would not need expensive pumping plants.

Though Harold E. Stassen in his presidential campaign of 1952 suggested a review of the canal project, this idea was not seriously reconsidered until 1967 when Jenó F. Paulucci, a well-known Duluth chow mein and pizza distributor, asked for a new study of the Superior-Mississippi canal.⁹⁷ Mid-Continent Surveys, Inc., made an economic evaluation in which they found that one dollar would move one ton of freight five miles by air, fifteen miles by truck, sixty-seven miles by rail, and 333 miles by river barge.⁹⁸ The canal barge, however, could not operate year-round. But this was not the greatest problem. Few people in the St. Croix valley wanted a canal. Opposition from environmental groups, the United States Forest Service, sportsmen, canoeists and many others made this an almost impossible project. Value systems had changed dramatically from a time when economic considerations alone determined feasibility.

Looking back over the seventy-five year period (1840-1915) when lumbering constituted the major industry in western Wisconsin, it is evident that the lumber industry enjoyed an unrestrained exploitation of the bountiful forests along the Black, Chippewa and St. Croix watersheds. The Corps became an active agent in river management after large lumber corporations had already jammed the rivers with logs and built hundreds of state-authorized dams. District engineers became concerned about the arrogant assumption of timber syndicates that they could wantonly control the nation's waterways. Corps regulatory powers, however, came too late to save one of our country's largest forest reserves. The story of Wisconsin rivers parallels the experience of Corps leadership in the western tributaries of the Mississippi. Conflict between populist concepts of the free use of the nation's waterways and the growing power of large corporations resulted in numerous controversies. The Corps of Engineers became a regulatory agent, as a result, between the opposing factions. Unfortunately, most of Minnesota and Wisconsin's timber resources were cut, logged, sawn and sold before any power to retard this activity was placed under federal supervision.

Notes

1. For a review of the whole project, see "Report of Board of Engineers," *Annual Report, 1880*, pp. 1953-61.
2. *Annual Report, 1885*, Appendix II-6; project costs are summarized in *Annual Report, 1880*, p. 1955.
3. August Derleth, *The Wisconsin, River of a Thousand Isles* (New York: 1942), p. 173.
4. Robert C. Nesbit, *Wisconsin: A History* (Madison: 1973), p. 297; Robert F. Fries, *Empire in Pine: The Story of Lumbering in Wisconsin, 1830-1900* (Madison: 1951), p. 91; Frederick Merk, *Economic History of Wisconsin During the Civil War Decade* (Madison: 1916), p. 65.
5. Derleth, *The Wisconsin*, pp. 227-28; Merk, *Economic History*, p. 96.
6. *Annual Report, 1880*, p. 1959.
7. George Fiedler, *Mineral Point: A History* (Mineral Point: 1962), pp. 72-73, 84, 112-14; Derleth, *The Wisconsin*, p. 174; Alice E. Smith, *The History of Wisconsin, From Exploration to Statehood* (Madison: 1973), I, pp. 529-30; Nesbit, *Wisconsin*, pp. 115-17.
8. Derleth, *The Wisconsin*, p. 163.
9. After Major G. K. Warren left the district in May, 1870, responsibility for the Wisconsin River was transferred out of the St. Paul office, and put in charge of Major David C. Houston who ran a United States Engineer Office in Milwaukee.
10. John Bell Sanborn, "The Story of the Fox-Wisconsin Rivers Improvement," State Historical Society of Wisconsin, *Proceedings, 1899*, pp. 186-94; Joseph Schafer, *The Winnebago-Horicon Basin* (Madison: 1937), pp. 90-131.
11. *Annual Report, 1904*, pp. 533-35.
12. Report of Board of Engineers on "Wisconsin River," *Annual Report, 1880*, p. 1953.
13. *Annual Report, 1880*, p. 1954.
14. *Annual Report, 1885*, p. 311.
15. *Annual Report, 1880*, p. 1961.
16. *Annual Report, 1880*, p. 209.
17. *Annual Report, 1880*, p. 1949.
18. Daniel R. Noyes, "Report of our Mercantile Committee," November 12, 1883, St. Paul Chamber of Commerce, SPD, Letters Received and Related Records Pertaining to the Wisconsin River Improvement, 1871-85, NARG 77.
19. *Annual Report, 1888*, p. 246; 1885, Appendix II-6.
20. *Oshkosh Northwestern*, June 27, 1886.
21. Fries, *Empire in Pine*, pp. 8-59; and Agnes M. Larson, *History of the White Pine Industry In Minnesota* (Minneapolis: 1949), pp. 3-70.
22. Fries, *Empire in Pine*, pp. 19-20; William Francis Raney, *Wisconsin: A Story of Progress* (New York: 1940), p. 203.
23. Albert H. Sanford, H. J. Hirshheimer, and Robert F. Fries, *A History of LaCrosse, Wisconsin, 1841-1900* (LaCrosse: 1951).
24. *Annual Report, 1937*, pp. 961-62; 75 Congress, 1 session, Rivers and Harbors Committee, *Documents*, no. 23.
25. *Annual Report, 1942*, p. 1056; 1948, p. 1610.
26. Frederick Merk, *Economic History*, p. 65.
27. Fred W. Kohlmeyer, *Timber Roots: The Laird, Norton Story, 1855-1905* (Winona: 1972), p. 84; Fries, *Empire in Pine*, p. 45; *Eau Claire Free Press*, May 6, 1869.
28. Merk, *Economic History*, p. 72.
29. Fries, *Empire in Pine*, pp. 125-27; Merk, *Economic History*, pp. 72, 74; Charles E. Twining, *Downriver Orrin H. Ingram and the Empire Lumber Company* (Madison: 1975), p. 29.
30. Kohlmeyer, *Timber Roots*, pp. 103-06.
31. *Annual Report, 1881*, p. 242, Appendix W-4.
32. *Annual Report, 1885*, p. 269, Appendix AA-5.
33. *Annual Report, 1901*, p. 446.
34. Kohlmeyer, *Timber Roots*, pp. 83-84; Matthew G. Norton, *The Mississippi River Logging Company: An Historical Sketch* (1912), pp. 1-10.
35. Though the story of the Beef Slough War has been told many times, one of the best summaries is in Fries, *Empire in Pine*, pp. 141-60.
36. Fries, *Empire in Pine*, p. 150.
37. Fries, *Empire in Pine*, pp. 152-53.
38. Kohlmeyer, *Timber Roots*, pp. 107-16.
39. Kohlmeyer, *Timber Roots*, pp. 108-09; 52 Congress, 1 session, *House Executive Documents*, nos. 178, 183.
40. James Taylor Dunn, *The St. Croix: Midwest Border River* (New York: 1965), p. 113.
41. Dunn, *The St. Croix*, pp. 51, 101-105; James Taylor Dunn, *Marine Mills: Lumber Village 1838-1888* (Marion-St. Croix: 1963), pp. 3, 11, 14, 20.

42. Captain Edward W. Durant, "Lumbering and Steamboating on the St. Croix River," Minnesota Historical Society, *Collections*, X, p. 1905; Dunn, *The St. Croix*, pp. 172-83; Mildred L. Hartsough, *From Canoe to Steel Barge*, pp. 168-71; *Annual Report, 1918*, p. 1198.
43. *Annual Report, 1875*, p. 372.
44. *Annual Report, 1882*, pp. 238-39.
45. *Annual Report, 1883*, p. 246.
46. *Hudson Star and Times*, March 3, 1871.
47. For a description of this episode see Dunn, *The St. Croix*, pp. 145-50.
48. Lieutenant Colonel Francis Shunk to OCE, July 29, 1912; John Wade to OCE, June 24, 1912, and Shunk to OCE, August 13, 1912, all in SPD, Letters Sent (press copies) NARG 77.
49. For background, see Rosemarie Vezina, *Nevers Dam... the Lumberman's Dam* (St. Croix Falls: 1965).
50. Major Frederic V. Abbot to OCE, July 26, 1898, SPD, Letters Received and Sent, NARG 77.
51. William Sauntry to Major Frederic V. Abbot, April 1, 1899, SPD, Letters Received and Sent, NARG 77.
52. Brigadier General John M. Wilson to Secretary of War Russell A. Alger, July 18, 1899, SPD, Letters Received and Sent, NARG 77.
53. Report of Major Frederic V. Abbot to OCE, July 6, 1899, SPD, Letters Received and Sent, NARG 77.
54. Brigadier General John M. Wilson to Secretary of War Russell A. Alger, July 18, 1899, and Second Indorsement by Lieutenant Colonel Alexander Mackenzie, August 4, 1899, SPD, Letters Received and Sent, NARG 77.
55. Lieutenant Colonel Alexander Mackenzie to Major Frederic V. Abbot, August 22, 1899, SPD, Letters Received and Sent, NARG 77.
56. Major Frederic V. Abbot to William Sauntry, August 5, 1898, SPD, Letters Received and Sent, NARG 77.
57. Circular letter from Major Frederic V. Abbot, December 18, 1899, SPD, Letters Received and Sent, NARG 77.
58. *Annual Report, 1898*, p. 320, Appendix AA-5; there are also numerous letters on file regarding the construction of this dredge by the Bailey-Lebsy Co. of Charleston, South Carolina, SPD, Letters Received and Sent, NARG 77.
59. *St. Paul Dispatch*, February 6, 1900; *Taylor's Falls Journal*, February 22, 1900.
60. Major Frederic V. Abbot to Andrew R. Kiefer, January 10, 1900, SPD, Letters Received and Sent, NARG 77.
61. This quotation and others in the following pages from St. Paul Chamber of Commerce, Public Hearing, *Proceedings*, January 18, 1900, p. 7, were found in a copy of the *Proceedings* in SPD, Letters Received and Sent, NARG 77.
62. Chamber of Commerce, *Proceedings*, p. 10.
63. Chamber of Commerce, *Proceedings*, pp. 17-18.
64. Hartsough, *From Canoe to Steel Barge*, pp. 176-79; Ralph H. Hess, "The Waterways and Commercial Evolution," *American Academy of Political and Social Science*, May, 1915.
65. Chamber of Commerce, *Proceedings*, pp. 51-55.
66. Chamber of Commerce, *Proceedings*, pp. 60-99, and Fred Bell, Laird, Norton Company to Major Frederic V. Abbot, January 17, 1900, SPD, Letters Received and Sent, NARG 77.
67. Chamber of Commerce, *Proceedings*, pp. 95-96.
68. Circular letter from Major Frederic V. Abbot, February 6, 1900, SPD, Letters Received and Sent, NARG 77.
69. *St. Paul Trade Journal*, February 10, 1900.
70. *St. Paul Dispatch*, February 6, 1900.
71. *St. Paul Dispatch*, February 12, 1900.
72. W. H. C. Folsom, "Answer to Stillwater Memorial," a widely circulated press release, February 21, 1900, SPD, Letters Received and Sent, NARG 77.
73. *Taylor's Falls Journal*, February 22, 1900; *Stillwater Gazette*, February 24, 1900.
74. Elihu Root, "Regulations to Govern the Floating of Loose Timber and Logs and Other Methods of Navigation on the St. Croix River Above Lake St. Croix," July 19, 1900, Brigadier General John M. Wilson to Elihu Root, SPD, Letters Received and Sent, NARG 77.
75. Representative Frederick C. Stevens to Colonel Alexander Mackenzie, July 18, 1900, SPD, Letters Received and Sent, NARG 77.
76. Major Frederic V. Abbot to OCE, August 1, 1900, SPD, Letters Received and Sent, NARG 77.
77. George H. Hazzard to Major Frederic V. Abbot, July 20, 1900, SPD, Letters Received and Sent, NARG 77.
78. Major Frederic V. Abbot to Brigadier General John M. Wilson, June 21, 1900, SPD, Letters Received and Sent, NARG 77.

79. Major Frederic V. Abbot to Brigadier General John M. Wilson, June 8, 1900, SPD, Letters Received and Sent, NARG 77.
80. Major Curtis D. Townsend to Major Frederic V. Abbot, March 2, 1900, SPD, Letters Received and Sent, NARG 77.
81. Modifications were issued on June 21, 1901, April 15, 1904, and April 20, 1907; see Major Francis R. Shunk to Brigadier General Alexander Mackenzie, January 15, 1908, SPD, Letters Sent, (press copies) NARG 77.
82. *Annual Report, 1907*, p. 504. See also *Annual Report, 1906*, p. 483, for a report on the status of the St. Croix River. See also Major Francis R. Shunk to Brigadier General Alexander Mackenzie, January 15, 1908, SPD, Letters Sent (press copies) NARG 77.
83. Major Francis R. Shunk to Brigadier General Alexander Mackenzie, January 15, 1908, SPD, Letters Sent (press copies) NARG 77.
84. Major Francis R. Shunk to Brigadier General Alexander Mackenzie, January 15, 1908, SPD, Letters Sent (press copies) NARG 77.
85. Major Francis R. Shunk to Brigadier General Alexander Mackenzie, January 15, 1908, SPD, Letters Sent (press copies) NARG 77.
86. *Annual Report, 1936*, p. 930.
87. Major Francis R. Shunk to OCE, December 25, 1908, SPD, Letters Sent (press copies) NARG 77.
88. *Annual Report, 1951*, pp. 1272-73; 1972, pp. 27-29.
89. Dunn, *The St. Croix*, p. 181.
90. *Annual Report, 1870*, p. 285.
91. *Annual Report, 1896*, pp. 2391-96.
92. Franklin J. Ryder, "Lake Superior-Mississippi River Barge Canal," (n.d. mimeographed) p. 6, SPD, Ryder Collection, St. Paul.
93. *Annual Report, 1900*, pp. 3613-16.
94. The report was finally published in *Annual Report, 1916*, p. 1299; 64 Congress, 1 session, *House Documents*, no. 1008.
95. Report of Board of Engineers, May 14, 1913, *Annual Report, 1916*, p. 1299.
96. Lieutenant Colonel Charles L. Potter to Ira B. Mills, May 2, 1914, SPD, Letters Sent (press copies) NARG 77.
97. *Duluth News Tribune*, October 13, 1967.
98. Ryder, "Lake Superior-Mississippi River Barge Canal," p. 14, SPD, Ryder Collection, St. Paul; *St. Paul Dispatch*, January 3, 1968; *Duluth News Tribune*, January 26, 1969; *Duluth Budgeteer*, January 23, 1969.