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The Logging Era at Voyageurs National Park Historic Contexts and Property Types



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This report was prepared as part of a Cooperative Park Service Unit (CPSU) between the Midwest Support Office of the National Park Service and the University of Wisconsin-Madison. The grant was supervised by Professor Arnold R. Alanen of the Department of Landscape Architecture, University of Wisconsin-Madison, and administered by the Institute for Environmental Studies, University of Wisconsin-Madison.

Cover Photo: Logging railroad through a northern Minnesota pine forest. The Virginia & Rainy Lake Company, Virginia, Minnesota, c. 1928 (Minnesota Historical Society).

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1. INTRODUCTION

The white pine in the lake region was the clearest and most perfect timber that has ever been harvested in the United States.

John A. Bardon¹

The purpose of this report is to provide a historic context for logging-related resources at Voyageurs National Park, situated east of International Falls, Minnesota, on the United States/Canada border. Information in this report can be used in designing reconnaissance and intensive surveys, preparing National Register of Historic Places forms and determinations of eligibility, formulating management plans for historically significant areas, and interpreting logging landscapes.

The Minnesota State Historic Preservation Office (SHPO) has identified two historic contexts for the state's lumbering era: St. Croix Lumbering and Northern Minnesota Lumbering (see Appendix 3). Logging at Voyageurs National Park clearly falls into the latter context. To date, the SHPO has minimally addressed the historic context, although *The Definition and Evaluation of Log-Procurement Properties in Minnesota*, by Douglas Birk, was published just as this report was being concluded.

Three sub-contexts of the Northern Minnesota Lumbering context have been identified for the area encompassed by Voyageurs National Park. Defined by temporal and technological factors, the sub-contexts are based on the special conditions that existed in the area during the logging era. Property types are defined for each sub-context.

Logging in the northern Minnesota border country came after the more accessible, southern and eastern parts of Minnesota were logged. Frank Gillmor, a 20 year veteran of the Virginia and Rainy Lake Company, stated that timber on the Minnesota Iron Range, because of its superior quality, was cut before the far northern timber. "While that timber was available, the companies never thought of logging farther north," he stated in a 1948

¹John A. Bardon, *Minnesota History*, Letter, vol. xv, (St. Paul, MN: Minnesota Historical Society, 1934), p.203.

interview. “The fine timber extended eight or ten miles north of Virginia, then west over the range. When they began to cut the mixed timber north of Virginia, profits were reduced. They had to take the small stuff as well as the large, and this doubled the cost.” He explained that “the logging cost is two-thirds the total cost against the lumber” (Gillmor 7-24/25-48, p.11).

Researching the history of logging in northern Minnesota is facilitated by the fact that the railroad era of logging was primarily a twentieth century phenomenon that unfolded before a world ready to document it with cameras and pens. The appeal, in no small measure, was the lumberjacks themselves—stalwart men who epitomized the rugged individualism of the American pioneer. Thus, even before the complete demise of logging’s Golden Age in the north country, a tremendous nostalgia developed for old-time logging. Writers, such as Walter O’Meara, historians like Agnes Larson, musicologists, such as Franz Rickaby, and photographers like Lee Brownell realized that an opportunity existed to document the passing of a historic period before it completely vanished. Later, others, like Mary Lou Pearson, took the time to listen to the stories of old-time lumberjacks and transcribe them for posterity. Thus, the period became well-documented through written and visual materials. Note what O’Meara wrote in the introduction to *The Trees Went Forth*, his novel based on his experience in a north country logging camp in 1917:

My job as a clerk at Camp Dempsey allowed me a good deal of free time for observation of what went on around me, and for putting down my experiences and impressions. This I did with a certain sense of history; because I appreciated, even then, that what I was seeing and living was a chapter of America which would soon be finished, and was never to be repeated. After Mokoman, the old-style lumberjack—the shanty boy who had never seen a steam winch or a shower bath—disappeared forever. After Mokoman there was no more logging in the old, grand manner (O’Meara 1947,p.58).

O’Meara uses the fictitious town of Mokoman as a substitute for Cloquet, Minnesota. In this passage, O’Meara alludes to the subsequent closing of the lumber mills at Cloquet after the timber resources were depleted. The closing ushered out the heyday of the logging era in northern Minnesota.

This abundance of written and visual material is juxtaposed against a landscape that left few historic remnants. Gone are the majestic trees felled by the thousands over the 50 years or so of Minnesota's logging empire. Gone are the camps—always intended as transitory abodes and deliberately dismantled and recycled as an area was cleared of logs. Nearly vanished, but occasionally strikingly evident, are the remnants of roads, sleigh haul trails, and rail routes. And washed away or fallen to the bottoms of the lakes is the evidence of dams, landings, and hoist sites. It is remarkable that so little above-ground evidence remains of the industry that completely transformed the region so recently.

The Logging Legacy in Today's Landscape

Today, the landscape at Voyageurs National Park conveys little of the logging industry's image fifty, seventy, or 100 years ago—the vegetation has changed, structures are gone, and the transportation network of roads and rails has vanished. Although often the evidence is subtle, the landscape can be read to reveal past activity.

The vegetation reflects the growth typical of a disturbed site, whether by human or natural forces. The white pine (*Pinus strobus*) and red pine (*Pinus resinosa*, historically called Norway pine) that supported the timber industry has been succeeded by the prolific poplar (*Populus alba*) and aspen (*Populus tremuloides*). These species thoroughly dominate the region, as they have for many years. They are the vegetative legacy of the nearly complete removal of what might be considered the terminal successional stage of the region's pre-settlement vegetation.

The absence of development and harvesting activity within the park has allowed the forests to reclaim the landscape. Although dwindling in number and size, breaks in the thick forest growth are indicators of the by-gone timbering era. Remnant corridors mark the routes of tote-roads, sleigh haul trails, and railroads. Berms, ridges, ledges, and holes in the vicinity of the routes indicate areas of cut and fill. Clearings that indicate the site of camps can occasionally be found. Without clearings, camp sites can be discovered from the record of upheaval that appears on the forest floor. Berms may indicate the outline of buildings, surface artifacts may be evident, and the vegetation may reflect an earlier stage of succession than the surrounding area. Shrubs, for example, may be more prevalent than trees, or trees may be younger in the camp site than surrounding trees.

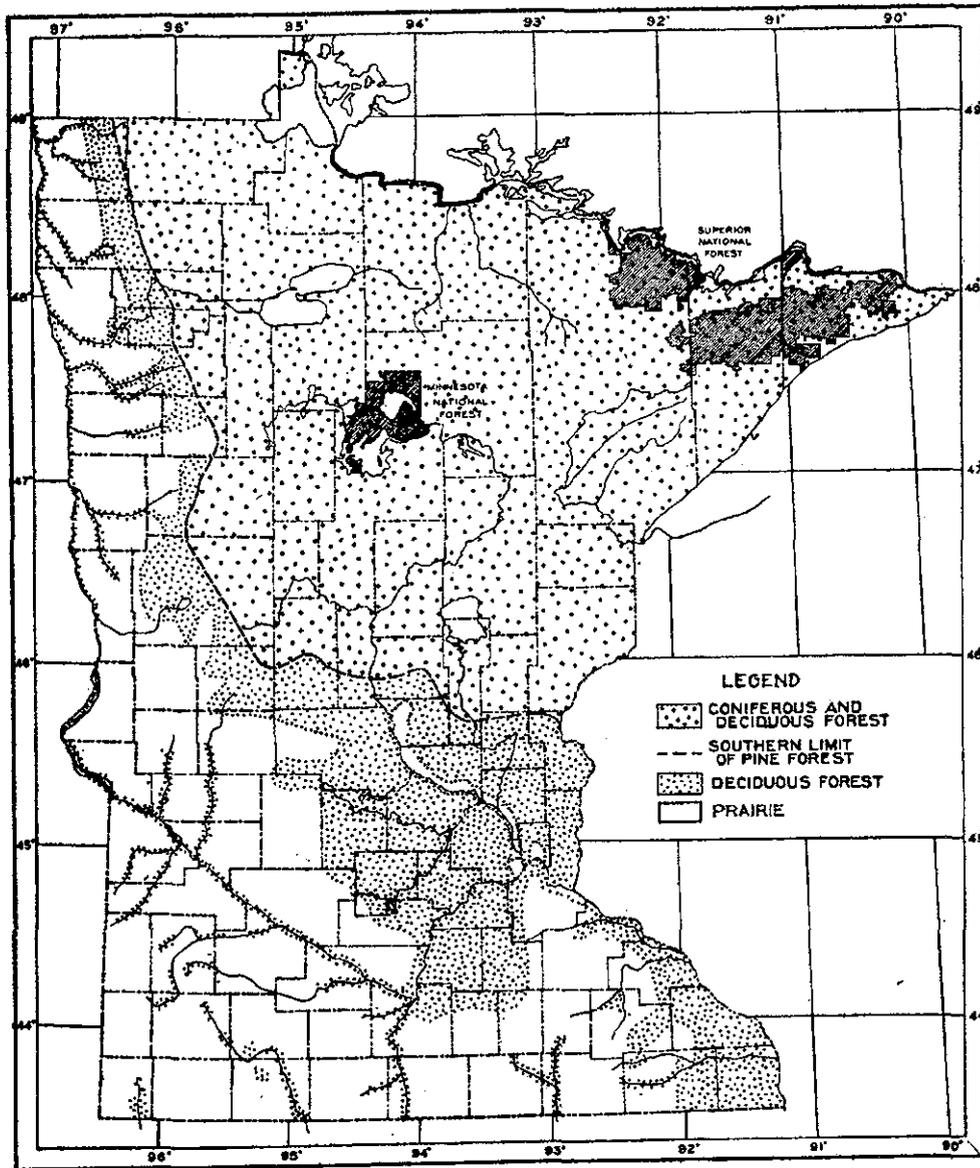


Figure 1: Original forest vegetation of Minnesota showing the location and extent of the principle forest types (J. A. Mitchell, *Forest Fires in Minnesota*, 1927).

The cohesiveness and significance of historic logging landscapes are dependent on the presence of both components of the logging system: camps and transportation corridors. At Voyageurs National Park, their relationship to waterways was a factor in their placement in the landscape, and an aspect that must be understood to evaluate the role of particular camps and corridors.

Ultimately, the historic logging landscapes of the Great Lakes states are not easily evaluated for National Register eligibility as rural historic landscapes, because they cannot

pass basic tests of integrity. With every passing year, the evidence of transportation routes and logging camps becomes more and more obscured by vegetation and the ravages of erosion. For the most part, too little remains above ground for these sites to be evaluated as anything other than historic archeological sites. They are, however, extremely significant historic archeological resources, and their National Register eligibility as such has been demonstrated.

The logging landscapes of the border country provide an important historical record that should be interpreted. Preservation of the most significant landscape features associated with logging—those that are evaluated as eligible for the National Register—requires the development of management plans and strategies that address the forces that work to obscure this dwindling supply of resources. The historic contexts presented in this report provide a framework for developing such strategies.

Because of the impact of logging on the landscape, its history in Voyageurs National Park is outlined in the three historic context descriptions identified in this report. For more detailed information, or a slightly different approach to the telling of the park's logging history, the publication *Special History Study on Logging and Lumbering as Associated with the Area Now Incorporated within the Present Bounds of Voyageurs National Park* should be consulted (Fritz, August 1986).

The ecological changes wrought by the industry are an important part of its landscape history. The lay of the land was changed to build roads, railroads, and sleigh haul trails, so if the routes have been obscured by tree growth, their legacy may be the undulations in the land that their creation caused. *The Fire and Logging History of Voyageurs National Park* contains an excellent description of changes in vegetation over time at Voyageurs National Park (Coffman, Rakestraw, and Ferris 1980); the *Vegetation and Fire History at Voyageurs National Park* also contains excellent information (Swain n.d.).

The camps that for such short periods witnessed the intense activity of as many as 200 men have likewise left scant surface evidence. What remains—both above and below ground—is all the more significant for what it reveals about the industry that created a region. Without any buildings remaining, their footprints on the earth become critical—whether deciphered through surface foundation remnants or deeper archeological records.

Northern Minnesota Logging: Sub-Contexts at Voyageurs National Park

The logging industry reached Minnesota in the mid-nineteenth century by way of the New England states, New York, Pennsylvania, Michigan, and Wisconsin. Processing aspects of the industry were affected by the progress of technology more so than harvesting in the early and middle years of the century. According to Rickaby, "by 1830 the steam-driven circular saw had supplanted the primitive water-power jig-saw mill" (Rickaby 1926,p.xviii). With this innovation, the thirst for timber became unquenchable.

The Army of the Axes had advanced even into the awe-inspiring columned vastnesses of Michigan, and across the intervening lake into the illimitable pineries of Wisconsin. What had previously been a steadily growing call for lumber, by 1870 swept suddenly upward into a reverberating clamorous roar of demand, as the hundreds of thousands, following the Argonauts of '49 and '50, surged out into the New West. It was then that American lumbering literally leaped into its Golden Age (Rickaby 1926,p.xviii).

The Golden Age, although not beginning as early in the border country as farther east, left its mark like no other period of logging history. Before this so-called Golden Age, which coincided with the railroad era of logging in northern Minnesota, logging was more desultory and sporadic. After it, King Pine was decimated, other lumber was sought, the romance and adventure of logging was suppressed by the Great Depression, and the industry was transformed by powerfully efficient methods.

Temporal limits of the three phases of logging history at Voyageurs National Park can be assigned by the means of transporting timber, the technology of the logging process, and the logging companies that were operating at the time. The use of railroads isolates the second phase from those that occurred before and after, more than any other factor.

The first phase of logging existed until 1907. Almost all logs were destined for Canadian mills during this early period, and both Canadians and Americans felled logs illegally on federally owned land. According to one of the logging pioneers in the region, Richard R. Bailey, there were good explanations for why the American timber went north:

. . . there was no duty to take timber into Canada. And they got beautiful timber, and they got it cheap. They got it delivered down there by water direct to their big sawmills. . . There were big operations on both the Canadian and on the American side, within five miles on each side of Rainy River (Bailey 1-9-53,p.8).

Bailey explained that the geography of the country dictated the flow of logs north. Because all rivers north of the Mesabi divide flowed north, “the only way it could be moved was by water north into Canada until the railroads and highways were built in later years. If it wasn’t for the railroads and the automobiles, you couldn’t get the timber out of that country south across the divide” (Bailey 1-9-53,p.8).

Early in this phase, logging was so unmechanized that it was called the “hand-tool period” by Larson and others (Larson 1932,p.356). In the earliest days of this period, logs were felled by ax and hauled for short distances by oxen to landings, over primitive roadways created in the process of felling trees. As the period progressed, the crosscut saw replaced the ax for cutting trees (although the ax still had a place in the woods), horses replaced oxen, hauls became longer, and the illegal looting of logs became less common. Logging was done by small operators, and camps were small.

With the arrival of railroads, logging on a large scale by the industry’s giants was initiated in the border country. Logging camps were huge, housing as many as 200 men, and there were many of them. In Voyageurs National Park 28 Virginia and Rainy Lake camp locations are known (including two at Hoist Bay), and three camp sites located near the park are known. A number of International Lumber Company camps were located in the area encompassed by the park. Other camps were operated by jobbers and small companies. This second phase of logging left an enduring legacy in northern Minnesota, because of its impact on settlement and the complete ecological upheaval that resulted. The period lasted only 30 years, from 1907 to 1937. It was made possible by rail hauling, although horse-drawn teams played an important role for many years. Other technological innovations greatly facilitated the removal of timber. In the border country the industry was dominated by the International Lumber Company and the Virginia and Rainy Lake Company.

By 1920 the best of northern Minnesota’s white pine had been removed and the glory days of logging were waning. The Virginia and Rainy Lake Company fell into receivership in 1928. The International Lumber Company finally folded in 1937. Smaller operations struggled, too. The effects of the nationwide Great Depression, the decimation

of the region's best timber, and the difficulty in establishing an agricultural base in northern Minnesota resulted in the ruination of the logging industry in Minnesota.

With the lifting of the depression, the logging industry emerged with a new intent. This third phase of logging took advantage of the more efficient logging methods that had been introduced after World War I. No longer was interest focused on the dwindling supplies of white pine, but on species like jack pine, aspen, and poplar that were used in the paper industry. Gone were the horses and river drives, replaced by trucks and caterpillars. Logging camps persisted well into the period, but they were not nearly as extensive. This period lasted until Voyageurs National Park was established in 1975.

The logging industry in northern Minnesota became more efficient with the passing of each phase: more lumber could be removed faster and more easily taken to market. As Larson noted:

Newer inventions speeded the movement of logs in the woods. The Steam log-hauler increased the speed; it carried immense loads. Shortly came the caterpillar tractor and then the steam skidder. These innovations relegated the oxen, the horses, and that man of men, the teamster, to the past. Speed had changed the peaceful atmosphere of the old logging camp. The powerful team of oxen, their bows squeaking and chains clanking, and the 'clear, profane voice of the ox teamster ringing through the forest' were gone. A donkey engine and the locomotive had replaced them (Larson 1949,p.364).

Voices from the Past

The logging era and its landscape were described by many people—lumberjacks who helped to transform the landscape, observers who passed through the landscape, and people who studied its physical properties and economic potential. Their impressions provide a glimpse of the landscape as it was being transformed and offer vital clues to how the land and its resources were manipulated during the logging era. Several sources provide particularly good descriptions of the historic logging landscape:

- *The Trees Went Forth*, by Walter O'Meara, is the story of a young college student's stint as a clerk in a lumber camp in northern Minnesota in 1906. The student, named Matt Bradley, had been raised in the fictitious town of Mokoman and his father had worked in the camps seasonally for about 30 years until his recent death, which begins the story. The book is undoubtedly largely autobiographical, although O'Meara

claimed that all of the characters and places are imaginary. O'Meara, who worked as a clerk for a year in a camp, kept a detailed diary of life in the camp. The fictional Mokoman of the story probably is Cloquet, Minnesota.

- *Rainy River Country and Voyageurs Highway*, by Grace Lee Nute. Although Nute did not work in the logging camps, her writings about the logging industry in northern Minnesota are unsurpassed in conveying graphic images of the era. Because her research began while the big logging companies still were operating in northern St. Louis County, Nute's field work included time with the crews. Fred Hilden said the following:

. . . I was in charge of bringing the timber down and sluicing the timber over Kettle Falls and that was in 1934. . . that was during the summer. That was an interesting operation, very interesting, very successful. There was a woman come up from St. Olaf College and interviewed me, she rode on one of the boats with me. Her name, I believe was Nute. She wrote a book called *The Voyageurs Highway*. . . She rode on the towboat and asked me a lot of questions (Hilden 6-12-76,p.27).

- In the mid-1970s NPS historian Mary Lou Pearson conducted interviews with several people who were connected to the logging industry in northern Minnesota. These first-hand accounts of logging provide excellent descriptions of logging practices and the logging culture. Some of the most helpful were her interviews with George Amidon, Fred Hilden, Alex Gerber, Noble Trygg, and Lester Pollard.
- It would be an oversight not to mention the well-known work on logging by Agnes M. Larson, *History of the White Pine Industry in Minnesota*. The technical and historical information in Larson's book was used extensively in the preparation of this report.
- Leslie R. Beatty was one of Minnesota's first forest rangers and, as such, he was in constant contact with all echelons of the logging industry, ranging from lumberjacks to moguls. In the 1960s Beatty reminisced about his career in installments in the publication *Conservation Volunteer*, published by the Minnesota Department of Natural Resources. Beatty began working for the Minnesota Forest Service in 1911 and stayed until 1958. His recollections provide a broad spectrum of descriptions. Mr. Beatty was assisted by Julius F. Wolff in preparing the series "A Forest Ranger's Diary."

- Although only a small amount of historical information was obtained from his work, Franz Rickaby provided valuable insights to the logging culture when he wandered across Michigan, Wisconsin, and Minnesota collecting folk songs from lumberjacks and their families in the early 1920s. Harvard University, from which he earned a master's degree in 1917, published *Ballads and Songs of the Shanty-Boy* in 1926, a year after Rickaby's young death of heart disease. Harry B. Peters, in his introduction to the work he edited, *Folk Songs out of Wisconsin*, described Rickaby's travels:

Playwright, poet, fiddler, composer, and indefatigable collector of folk songs, Franz Rickaby liked nothing better than to walk and hitchhike from one small town to another relying heavily on his skill with song and violin to pay his bed and board, alternately playing and listening, and eventually transcribing the songs that he committed to memory along the way (Peters 1977,p.8).

The introduction to Rickaby's book provides an eloquent explanation of the movement of the logging industry from the east coast to the lake states, and then from Michigan to Minnesota.

- Ralph Clement Bryant's work, *Logging, The Principles and General Methods of Operation in the United States*, provides excellent explanations of logging processes and equipment. Published in 1913, the book is directed to those involved in the logging industry and, therefore, is quite technical. His glossary is included in this report as Appendix 6.

2. EARLY LOGGING IN MINNESOTA

Lands untouched by waterways and with resources remote from market were regarded as undesirable for settlement. Not so Minnesota!

Agnes M. Larson, 1972²

A synopsis of the early logging industry in Minnesota is included to provide some perspective on the development of the industry in the border country in later years. Most of the information in this chapter was obtained from Agnes Larson's seminal work, *The White Pine Industry in Minnesota*. Her work should be consulted for a detailed account and analysis of the history of the Minnesota logging industry.

Before the logging industry reached the upper Midwest, the clearing of widespread forests had first transformed the colonies, then the states, of the eastern seaboard. Bacig and Thompson described the demand for Eastern lumber:

The demand created by the building needs of the colonies, the use of wood in wagons, boxes, and barrels, and the need to build ships for commerce and the navy produced by the Revolution and the War of 1812 was so great that what seemed an inexhaustible supply in the New England pineries was, by 1820, no longer sufficient to meet the needs of the emerging eastern urban complex of the new nation. And as the agricultural community of the new nation pushed west over the Alleghenies, the forests of New York, Pennsylvania, and Ohio fell to farm and town. As towns turned to cities, the demand for wood grew inexorably. And of all woods, the most desirable—the most malleable, the lightest, the strongest, and the best for building houses, barns, casks, wagons, furniture, and plank sidewalks—was white pine. . .

By 1840, there were 31,560 sawmills operating in the country, 6,356 in New York alone. Most of the New York mills were operated by men who were part-time farmers, part-time lumbermen. They cut to build the new nation's fastest growing state and could not cut enough to meet the demand. In 1850, New York led all states in lumber production; similarly, for one or two years between 1860 and 1870, Pennsylvania was the nation's leading lumber producer supplying local needs. But it was in Maine and New England that lumber was cut for export, cut to supply the insatiable demands of Europe, New York, Massachusetts, and Pennsylvania (Bacig and Thompson 1982,p.3,10).

² Agnes M. Larson, *History of the White Pine Industry in Minnesota* (New York: Arno Press, 1972), p.8.

After northeastern forests were harvested, logging became concentrated first in Michigan, then in Wisconsin and Minnesota. Wealth from the eastern states backed the midwestern industry, and people from all facets of logging moved west in droves. The westward progression of tree felling, from the Northeast to the Midwest, was explained by Bacig and Thompson:

. . . And in the Northwest Territory, what awaited these lumbermen were enormous stands of that same white pine. In Michigan, the government estimated that 150 billion board feet of white pine could be cut. By 1897, 160 billion had been cut and 6 billion were still standing, mostly in the Upper Peninsula. In Wisconsin, an additional 130 billion board feet of red and white pine awaited cutting. In Minnesota, there were 68 billion board feet. Between 1873 and 1920, the old Northwest Territory would produce 217 billion board feet of pine (Bacig and Thompson 1982,p.10).

The lumber industry grew to meet the demands of ever-increasing waves of people moving west. Lumber of the upper Midwest was shipped in all directions. Wood from Michigan was marketed on the east coast through Albany, New York, and it built farms and towns throughout Ohio and Indiana. Chicago became a major market for Michigan timber, and much of the city was built of Michigan wood. Large quantities of Wisconsin and Minnesota timber were destined for St. Louis, for many years the most important Midwest market, and from there to points west and south (Bacig and Thompson 1982,p.11). Larson explained that "St. Louis was a terminal point for commerce in the newer West. It brought together the trade of the Missouri, the Upper and the Lower Mississippi, and the Ohio; it served as a point of exchange between East and West, North and South" (Larson 1949,p.11).

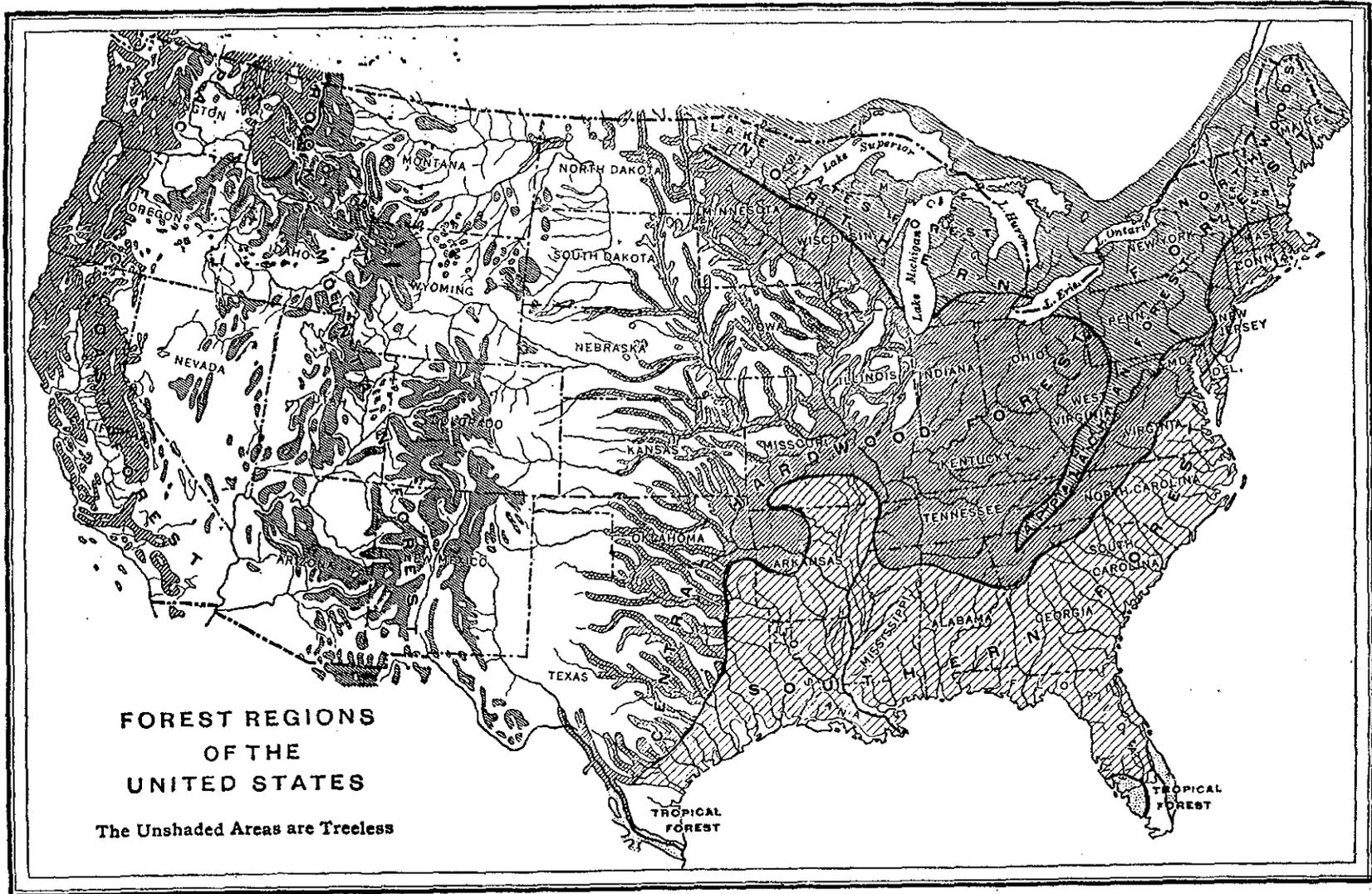
St. Louis entrepreneurs spawned the early development of the Minnesota lumber industry, together with men from elsewhere on the lower Mississippi River, before Maine loggers and eastern capital had found their way west. Larson stated that their knowledge of the north country was extensive, because St. Louis had been the entrepôt for the fur trade (Larson 1949,p.12-14). She explained:

Men from downriver moved northward up the St. Croix, up the Chippewa, wherever there was white pine to be had. These men were to become manufacturers, wholesalers, and retailers and were to supply the already established and growing downriver market. It was this busy market of the Middle and Lower Mississippi—established before the forest empire of the northland had been touched—which gave the initial commercial impulse to the establishment of the white pine industry in the region that was to become Minnesota (Larson, p.13).

“Downriver” (Mississippi River) men formed the St. Croix Lumber Company in 1838, at the head of navigable waters on the St. Croix River in Wisconsin, about fifty miles from its juncture with the Mississippi. The commercial lumber industry in Minnesota began with establishment of the Marine Lumber Company, also on the St. Croix, twenty miles below the Falls of the St. Croix. In 1839 the company “placed the first lumber on the market from the region that was to become Minnesota” (Larson 1949,p.16).

The influx of Maine loggers and capital began shortly thereafter. John McKusick, from Maine, established the Stillwater Lumber Company in 1844, 35 miles up the St. Croix River from its juncture with the Mississippi, in 1844. Isaac Staples and Samuel Freeman Hersey, also lumbermen from Maine, began operating the Hersey, Staples, and Company mill on the St. Croix in 1854. Dudley C. Hall of Medford, Massachusetts, and James A. Whitney and John Brooks Fenno of Boston also were stockholders in the company, and later Charles and Jacob Bean of Maine were investors (Larson 1949,p.18-20).

Other eastern money followed, as did economic resources from downriver, and the industry spread from the St. Croix to the upper Mississippi River. In 1848 Franklin Steele purchased land on the eastern side of the Mississippi at St. Anthony Falls, where, according to Larson, “he was about to lay the foundation of the parent industry of Minneapolis, that of lumber. Virtually he was the founder of Minneapolis” (Larson 1949,p.33). To help him establish his lumber empire, Steele recruited several men from Maine: Daniel Stanchfield to cruise for lumber in the pineries to the north and Ard Godfrey and others from Maine to supervise the construction and operation of the mill. From this beginning, the lumber industry at St. Anthony Falls grew exponentially, and it was to St. Anthony Falls that the first Maine woodsmen came. Larson explained:



THE LOGGING ERA AT VOYAGEURS NATIONAL PARK

Figure 2: Map of the United States showing natural forest regions (Ralph Clement Bryant, Logging, 1913).

From Maine and other New England states on the very eastern border of the white pine came armies of lumbermen, carrying the ax into the unexploited regions of the same kind of forest in the West. They came as if drawn by a magnet. Maine and Minnesota had much in common. The climate, much of the topography, and the natural resources of Minnesota were like those of Maine. The men who had learned lumbering firsthand on the banks of the Penobscot, or the Androscogin, or the turbulent St. Croix, easily transplanted themselves to the business of rolling logs on the Mississippi, the Rum, or the St. Croix in Minnesota. . .

Prominent in this group of Maine lumbermen were Ard Godfrey, Caleb Dorr, S. W. Farnham, C. C. Washburn, W. D. Washburn, Dorilus Morrison, Clinton Morrison, and Leonard Day and his three sons. From the same "White Pine" state came John De Laitre, Howard De Laitre, J. M. Robinson, J. A. Lovejoy, O. A. Pray, and Charles A. Bovey.

New Hampshire followed Maine's example, sending equally able men such as John S. Pillsbury, George A. Pillsbury, and their nephews, Charles A. and E. C. Pillsbury, together with old Joel B. Bassett, William W. Eastman, and John W. Eastman. Captain John Martin and Roscoe P. Russell came from Vermont. Massachusetts sent A. W. Taylor, and Connecticut, Henry Titus Welles. These men were to change trees into hard dollars . . . There is hardly one of them whose career would not cover important pages in the history of Minneapolis, and the descendants of many of them are still active in that city and in the Northwest today (Larson 1949,p.37-38).

Money alone would not fuel the industry. The legions of settlers moving west opened new markets and contributed to the workforce needed for the emerging industry. The key to attracting European and eastern American settlers to the land available in Minnesota was establishing a rail link to the Mississippi River. In 1854 this was accomplished when rail service from Chicago to Rock Island, Illinois, began. Within the next four years, rails were laid to LaCrosse and Prairie du Chien, Wisconsin. From these ports, settlers poured into the Minnesota Territory (Larson 1949,p.30-32).

Another center of lumbering developed in the "Suland"—the rich agricultural region of southern Minnesota that was not important for its stands of white pines, but for providing a substantial market for the pineries of the St. Croix and Mississippi. Winona became a major lumber manufacturing center, with the first of ten sawmills ready for production in 1855 (Larson 1949,p.43). Larson stated that "Stillwater still sent her product down the St. Croix and on into the Mississippi, but from the mills at the Falls of St. Anthony and at Winona the flow of lumber was westward to supply a local market" (Larson 1949,p.52).

Many of the same Easterners who invested in the mills of St. Anthony also bought large portions of the St. Croix Delta pinelands. Other large investors did not become lumbermen, but their names are important in the annals of Minnesota logging history. Substantial investors included Erastus Edgerton, a wealthy banker in St. Paul, Weston Merrit, originally from Massachusetts, but transplanted to Hudson, Wisconsin, and Cyrus Woodman, from Mineral Point, Wisconsin, who invested in many ventures in the region (Larson 1949,p.65).

Later in the nineteenth century, as the forests of Michigan were exhausted, lumbermen from Michigan became interested in Minnesota pinelands and mills. Again, Larson:

Michigan's market, Michigan's capital, and Michigan's lumbermen were being released to Minnesota: Akeley, Hall, Ducey, Shevlin—names of importance in the world of lumber—came to Minneapolis; others moved to Duluth. . . The men who had come from Maine and other New England states had laid the basis for the lumber industry in Minnesota, but the men from Michigan speeded it up, and under their direction Minneapolis became the primary white pine market of the world (Larson 1949,p.229).

Minnesota lumbering began as an industry of many participants, but by the 1890s timberland ownership was concentrated in the hands of a few powerful investors. Many of the investors mentioned above had huge stakes in the pinelands, but no name is more associated with logging and the lumber industry than Frederick Weyerhaeuser. The German native came to Pennsylvania in 1852, and eventually worked in the sawmill of Mead, Smith, and Marsh in Rock Island, Illinois, which he and his brother-in-law purchased in 1860. He invested in timberlands along the Chippewa River, then farther north in Wisconsin, and then in Minnesota, where Weyerhaeuser interests harvested the last of the white pine of the Lake States (Larson 1949,p.231-32). This last venture was initiated toward the end of the nineteenth century.

Interest in timber resources in the Duluth district, the area north and west of Lake Superior, came after the region had attracted investors interested in the region's copper and iron potential, and others, such as Jay Cooke, interested in developing the port city as a commercial center (Larson 1949,p.268). Logging in the Duluth region of northeastern Minnesota began in all seriousness when the railroad reached this outpost in 1870. This later lumbering was characterized by the consolidation of ownership among fewer

participants, and was driven by a different market than the timber of lower Minnesota.

Bacig and Thompson explained:

Duluth lumber began by flowing west with the Northern Pacific . . . It ended by flowing east, controlled by Michigan timber interests or Cleveland and Pittsburgh steel interests; it flowed to Tonawanda, New York, the greatest white pine assembling and distributing market on the continent, Buffalo and Albany (Bacig and Thompson 1982,p.15).

“The 1880s are the lumbermen’s decade in the history of Duluth,” wrote Larson. The rush to purchase timberlands began in earnest in 1882, after

. . . President Chester A. Arthur issued a proclamation that two million acres of pine timberland were to be offered at Duluth, Minnesota, beginning Monday, December 4, 1882. . . . The lands stretched over a large area from Cook County at the point of the ‘Arrowhead’ north of Lake Superior into Itasca County. Cook, Lake, and St. Louis counties, as well as much of Itasca County, were included (Larson 1949,p.271).

The remainder of Itasca County timberlands were opened for sale at the St. Cloud land office in September 1883 (Larson 1949,p.278). Michigan purchasers of timberlands included William C. Yawkey of Detroit and Marshall H. Alworth and Arthur Hill from Saginaw County, Michigan. Timberland purchasers from Wisconsin included David E. Miles and Loren D. Brewster, Thomas Bardon, Anthony J. Hayward, and Charles L. Mann (Larson 1949,p.273). Minnesota lumbermen from the St. Croix, the Falls of St. Anthony, and St. Cloud invested in the northern industry as well. Names familiar from these earlier centers of the logging industry include John S. Pillsbury, Thomas B. Walker, John Martin, Sumner Farnham, James Lovejoy, Curtis H. Pettit, and Jabez Robinson. New Yorkers who bought large tracts of timberland included Orrin Higgins, Hiram Sibley, and Amos Bissell. The list is by no means complete, but illustrates the pattern of investment from Michigan to Wisconsin to Minnesota’s lower forests to its northern forests.

Land sales on a grand scale continued through the 1880s and into the next century. The Saginaw firm of Duncan, Brewer and Company established a sawmill in Duluth in 1887; in 1891 Merrill and Ring, also from Saginaw, moved to Duluth. Alger, Smith and Company moved to Duluth from Michigan in 1899, as did A. W. Wright, C. A. Davis, and C. W. Wells, prominent Michigan lumbermen, at about the same time.

In 1896 Weyerhaeuser interest in northern Minnesota crystallized with purchase of the C. N. Nelson Lumber Company in Cloquet, other sawmills in Cloquet, and vast quantities of pine lands. At this time mills were developing elsewhere in the Duluth District—Virginia, Tower, Ely, Mesaba, and McKinley. Record cuts were made in the Duluth District in 1892 and 1893, but no year surpassed the cut of 1902: 1,031,775,000 feet. From that year cuts declined for the obvious reason: the forests in the district were becoming exhausted (Larson 1949,p.254). But, Weyerhaeuser became involved in one more Minnesota enterprise, beginning in 1908, before he shifted his focus to the great forests of the Pacific Northwest: the Virginia and Rainy Lake Company (Larson 1949,p.235). The emergence of that company and the logging industry in the northern Minnesota border country are discussed in the remainder of this report.

As early as the late 1880s, Minnesota lumbermen began to feel competition from the timberlands in the southern and northwestern United States. The plentiful yellow pine forests, stretching from the Atlantic Ocean to Arkansas, was inferior to white pine, and its availability made it cheap. After the Northern Pacific Railroad reached Tacoma, Washington, in 1888, the northwestern cedar and fir proved to be an unbeatable competitor. Larson noted:

But western lumber, like the yellow pine of the South, had so low a stumpage price that, even with a large transportation cost, it was a serious competitor of white pine. In 1900 Frederick Weyerhaeuser and his associates purchased 900,000 acres of Washington timber from the Northern Pacific, paying about six cents per thousand feet for it. A tree containing 25,000 feet of lumber was not uncommon in those forests (Larson 1949,p.398).

The dwindling supply of Minnesota white pine could not compete against such a supply. In fact, as early as 1919, when the last mill in Minneapolis ceased sawing, Douglas fir and western pine constituted 52 per cent of the sales in Minnesota lumber yards (Larson 1949,p.398-99).

Thus, as the forests were cleared in region after region in Minnesota, the industry sought new forests. At last, Minnesota could serve it no more on a grand scale, and the industry moved west and south. The settlers, capital, and industry that Minnesota's forests had attracted, and the role its clearing had in the development of agriculture, was the positive legacy of the lumber industry. The decimated landscape was a legacy that would take decades to remedy.

3. SUB-CONTEXT 1: EARLY LOGGING AT VOYAGEURS NATIONAL PARK, PRIOR TO 1907

The remark may here be made that the White Pine, in favorable localities, retains its growth to a great age.

Gifford Pinchot, 1896³

For several decades before timber was systematically cut in the forests of northern Minnesota, it was taken illegally by Americans and Canadians from unsurveyed government-owned land. In the northern border country, timber remained virtually inaccessible to Americans, but Canadians had a genuine presence on Rainy Lake, which was better connected to more settled regions of their country.

In 1792 the North West Company of Montreal, Canada, established a post on the lower Rainy River to serve fur traders in the region. When the North West and Hudson's Bay companies merged in 1821, the post became less important, but still it served a supply function. The post was named Fort Frances in 1825, and remained a fur trading post until 1898. The Canadian presence along the Minnesota border was strengthened by the opening of the Dawson Trail in 1871. This land/water transportation route was intended to facilitate the movement of Canadian pioneers across southern Canada, thus promoting the settlement of western regions. David Fritz describes the impact of the route on northern Minnesota in *Special History Study on the Dawson Trail and Other Transportation Routes Relating to Voyageurs National Park, Minnesota* (Fritz 1986).

In 1875 the Canadian government began building locks at Koochiching Falls in order to improve steamboat travel on the Rainy River and Rainy Lake. Although the project was abandoned after three years in favor of the transcontinental railroad, Nute stated that steamboat travel remained the chief form of transportation in Fort Frances until about 1901 and even longer in International Falls. "By 1890 there were twenty-one steamboats plying between Rat Portage (Kenora) and Fort Frances, according to a United States

³ Gifford Pinchot and Harry S. Graves, *The White Pine: A Study, with Tables of Volume and Yield* (New York: The Century Company, 1896), p. 16.

timber agent who was there in that year,” wrote Nute. She concluded that steamboat travel was “practically the sole means of transportation between Rat Portage and the upper end of Rainy Lake” (Nute 1950,p.50-51).

Nute wrote that because there was little white or red pine on the Canadian side of the border west of Lake Superior, the stands on the American side of the border were subject to looting by Canadians (and by Americans who sold the timber to Canadian mills). This illegal activity probably began after 1879 when the Canadian Pacific Railway was formed, and lasted until about 1900 (Nute 1950,p.52). Nute stated that “eighty-five million board feet a year was not an uncommon amount to be cut on American soil and driven down to Lake of the Woods, there to be formed into great rafts and towed to Rat Portage or its suburbs, Norman and Keewatin” (Nute 1950,p.54). She identified eleven mills operating on the Rainy River and Lake of the Woods and a lumber company and mills at Rat Portage—all of which supplied the railroad construction and related building it spawned. The steamboat traffic sometimes was held up by the “immense” log drives on Rainy Lake. She claimed that one of the companies on the Rainy River, Loper and Rumery, “had many camps in northern Minnesota for years before the timber could be bought legally and cut” (Nute 1950,p.53-54). Further research is needed to determine if any of its camps were in the area that became Voyageurs National Park.

United States timber agents periodically reported on the illegal cutting of timber on unsurveyed land, but they could not effectively stop it without a permanent presence of settlers. Nute stated that:

As early as 1878 these depredations were reported to government agencies in Washington. On February 9 of that year John W. Jones, special timber agent at St. Paul, wrote that he had been informed that British subjects, who owned a mill at Fort Frances, “are cutting large quantities of timber from United States lands.” The firm, he wrote, “has the contract for furnishing the lumber and timber for building the ship canal around the Falls of Rainy Lake River” (Nute 1950,p.54).

Less has been written about early logging in northern Minnesota than later periods, probably because, although this phase lasted for many years, it involved far fewer people than later periods and yielded far less timber. Logging had relatively little impact on the area encompassed by Voyageurs National Park, because the timber there could not be

effectively retrieved for milling until the technologies of the next phase of logging, notably railroads, reached these hinterlands. Consequently, its impact on the landscape was much less profound. Logging was concentrated on the shores of lakes and streams that could serve to transport logs. Roads were not built to reach the logs or facilitate its removal, but a go-devil (rough sled) was used to haul logs over a route through the cleared forest.

An image of the forest landscape during this era of relatively minimal logging can be glimpsed from several sources. According to Nute, the *Rainy Lake Journal* in 1894 estimated the extent of pine growth in the following terms:

It is estimated that 700,000,000 (board) feet of pine is standing on Lake Vermilion and tributaries, including Hunter's Island and Kabetogama, Crane and Namekan lakes, while on Lac la Croix and Rainy Lake and tributaries there are 1,300,000,000 feet of marketable pine (Nute 1950,p.57).

Nute stated that the looting of American lumber for Canadian mills stopped early in the twentieth century for several reasons. A major factor was the opening of northern ceded Indian lands, which led to their survey and disposition, and the beginning of legal logging by Americans. Although the area encompassed by Voyageurs National Park was ceded by the Bois Fort Band in 1866, surveys did not begin there until 1881 (Nute 1950,p.52; Trygg 1966). Other factors that curtailed the Canadian logging of the border lands were the construction of the dam at Koochiching Falls, which was begun in 1905, and the arrival of railroads at International Falls in 1907, which ushered in a new type of logging operation (Nute 1950,p.58).

Fred Hilden, who came to International Falls in 1908 and worked in the lumber industry until his retirement in 1958, described his experiences as a young man as the last vestiges of the early logging period were giving way to the second phase:

I went through the three important phases of the timber industry in Minnesota. First, the timber which consisted entirely of logs was cut on a comparatively short haul, compared with that of today, and sleigh hauled to the nearest streams. Oxen were still used in those days, but were fast being replaced by horses (Hilden 6-12-76,p.2).

Hilden stated that logs driven on Rainy Lake and its tributaries during this period were probably destined for the Rainy River Lumber Company or the Rat Portage Lumber

Company, both at Rainy River, Ontario (Hilden 6-12-76, p.2). Perala found that the Rat Portage Lumber Company “took great quantities of timber from Kabetogama, Namekan, Sand Point, and Rainy lakes, all of which went over Koochiching Falls and ultimately to Rat Portage” (Perala 1967,p.48). In a corporate history of the Minnesota and Ontario Paper Company (known as “Mando”), it was stated that Mando:

. . . was not the first to tap the forest wealth of this area, however. At least 15 years before, lumber companies with mills at Rat Portage (now Kenora) and at Rainy River, Ontario, and Spooner, Minnesota (sic), were operating logging camps in the Rainy River and Rainy Lake districts. Millions of feet of logs were floated over Koochiching Falls before the dam was built (Comeau 1950,p.5).

Lyman W. Ayer, a timber cruiser for E. R. Backus, noted in a journal he kept on his trip through the border country in 1902 that quantities of logs in Rainy Lake were sufficient to cause logjams:

Monday, Sept 15th (1902)

Returned to Kettle Falls. The Boat was detained some time at the outlet of the Lake by a jam of logs which were just being turned into the River. This made it so late to break camp today (Ayer 1902-03, p.20).

The Logging Process in the Early Logging Period

In this low technology period, after the timber was cut it was skidded over ice to the river or lake, then driven by water to the mill in the spring. The process of skidding large trees was facilitated by the removal of bark from one side so they could be skidded with the smooth side down (Ryan 1975,p.5). According to Larson, teams of oxen pulled go-devils (sleds) loaded with timber to a landing where the trees were cut into logs and driven downstream (Larson 1932,p.356). However, Ryan noted that few oxen were used in the northern part of the pine range, but that horses were used for hauling (Ryan 1975,p.5). He wrote that oxen were slow and that it took “eight head of oxen to handle a load that four good horses would haul” (Ryan 1975,p.22). *Logging companies kept their own horses and rented them from farmers and horse breeders.*

Because the area logged was small, only short hauls to a river or lake were needed. These early trails, cut by “swampers,” were simple, transitory, and lacked the complex network of routes that characterized later phases of logging (Ryan 1975,p.5).

The logging techniques and technologies were a blend of Canadian and Maine traditions, according to Larson. The major difference between the two methods seems to be that Canadians cut trees into logs where they were felled, rather than hauling them to the water to be cut. Because the Canadians used a cant hook to roll logs, they could carry bigger loads to the landings. According to Larson, "this brought about a change in the mode of transportation in the woods, which led to the use of bobsleds, bigger teams, bigger loads, and log roads" (Larson 1932,p.357). Bryant defined the difference between a cant hook and a peavey, another important tool during this period:

The peavey is used as a lever to handle logs, and is an indispensable part of a logger's equipment. The standard maple or ash handle is 5, 5-1/2 or 6 feet long, but it may be made in special lengths from 4-1/2 to 8 feet. . . The handle of the (socket peavey) is fitted into a socket, which is armed on the lower end with a pike, and on the upper end of the socket is a clasp to which the hook is bolted.

The (clip peavey) has a pike driven into the end of the handle, which is bound with a metal band to prevent the wood from splitting. The hook is attached to a clip or clasp independent of the pike.

. . . Cant hooks are used for purposes similar to the peavey, although they are employed more around mills and in handling sawed timber than in handling logs. Standard handles are 4-1/2, 5 and 5-1/2 feet in length. They are shod on the end with a heavy band of iron, carrying on its under side a "toe" which replaces the pike on the peavey. A hook of the same character as that on the peavey is fastened to the handle by a clasp (Bryant 1913,p.85).

In the early years of logging in the United States, the ax was used exclusively for felling trees. Bryant described the cutting process as follows:

In felling with an ax, the operation begins by cutting a wedge-shaped notch opposite and slightly higher than the undercut. This cut is continued towards the center of the bole until the tree falls. Wedges cannot be used in felling with the ax, therefore, it is more difficult to throw a tree in any direction except that in which it leans. It is estimated that from 10 to 20 board feet per tree of spruce is lost when the ax is used exclusively for felling and log-making (Bryant 1913,p.93).

By the time the border country was being logged, certainly before the end of the early logging phase there, the more efficient and less wasteful crosscut saw was used, although the ax still had a place in the woods. Beatty noted that the crosscut saw was being used in northern Minnesota by 1890 (Beatty March/April 1962,p.3). Ryan wrote that typically

saws were six to seven feet long. They were sprinkled with kerosene before each cut to work through the pitch of pines (Ryan 1975,p.12-13). The felling process began by cutting a notch on the trunk to guide the fall of the tree (the undercut). Bryant described the typical method for notching a tree:

The notch should be placed about 4 inches below the point at which the felling cut is started on the opposite side. Its height above ground is determined entirely by the policy of the logger regarding stump heights. Notches are generally cut with the ax, but the horizontal cut may be made by a saw and the notch completed with an ax (Bryant 1913,p.93).

Bryant described the process of felling trees with saws as such:

The saw-cut is started on a level with or slightly above and opposite the undercut. When the saw has buried itself, wooden or iron wedges are driven in behind it to prevent binding. As sawing proceeds the wedge point is made to follow the back of the saw by occasional blows. Sawing in a direction parallel with the undercut progresses until the tree begins to fall, whereupon one sawyer withdraws the saw and both seek a place of safety. On very large timber fallers first saw deeply on both sides of the undercut, then saw around the tree, making the last cut on the back side of the bole parallel to the undercut. . . . When timber is felled in a direction other than that in which it leans the faller leaves the most wood between the saw-cut and the undercut on the side opposite to that in which the tree leans. This tends to pull the tree in the desired direction (Bryant 1913,p.94).

The skidders followed closely behind the sawyers. Their job was to skid the logs down to the water on the trail cut by the swampers. For hauls less than a quarter of a mile, a go-devil, pulled by a team, would have been used in the early days. This simple sled consisted of two hardwood runners that were made from timbers having a natural crook. A bunk was bolted to the runners, and a chain passed around the logs and through a ring on the bunk (Bryant 1913,p.154). O'Meara wrote that the go-devil was pulled by two horses (oxen earlier). He wrote that the long dray was a longer version of the go-devil, which could hold bigger loads and was used for longer hauls (O'Meara 1975,p.7).

Later in this pre-railroad phase of logging, even bigger loads could be carried by other types of sleds. O'Meara described hauling sleds that were being used in northern Minnesota in 1906 as follows:

The hauling sleds, upon which huge loads of logs were hauled, had runners about 4 in. thick and 8 feet long. Beams were set in castings from runner to runner.

Beams 10 in. by 12 in. between runners. Four runners to sleigh. Runners 7 ft. from center to center. Each 8 ft. long. Bunk on top of beam, Norway pine log, round on top and flat on bottom, fastened with king pin to beam in center. . . Key logs secured to bunks by chain (corner bind chain). This log holds all others on load. No stakes or chains over load. Load built up about half way, then chains thrown over top of logs and more logs put on. Then top of load encircled with chain which is drawn tight. Logs on top of chain for binders. Logs hauled by either single team or four horses. Haul 5000 to 7000 feet to load. Teamster usually stands on board put across front roller. Some ride on top of load. King pin break going down hill usually means death for driver. Sand on hill sometimes breaks king bolt (O'Meara 1975,p.5).

The use of sleds that carried large loads obviously required better road building. Again, O'Meara provided a good description of sleigh roads. He wrote that the main road, which travelled about three to six miles from the landing to the back end of the operation, was about 10 feet wide. This road followed a creek, when possible, to assure a down grade, but very steep grades were avoided. The process of road building often required cutting and filling to level the bed, and dynamiting to remove rocks and roots. The roads were iced with a sprinkler, a large tank with holes that was pulled by horses. Ice was formed four to six inches deep at the beginning of the season, but by the end of the season the ice had built up to a 10 or 12 inch depth (O'Meara 1975,p.12).

The roads were cut in September or October, before the logging season started. When freezing weather came, preparation for the sleighs began. Tanks poured water on the roads to build up the ice layer, then:

. . . a "rut cutter" was sent out to make ruts for the sleigh runners. The rut cutter had blades that cut parallel ruts about four inches deep. The blades could be raised or lowered, and there were little flanges back of the cutters to shove the chipped ice out of the ruts and off the road and to slope the shoulder of the road. . . After logs were being hauled, the rutter was used only now and then, depending on the weather. Water from the tanks would run to the low spots in the road and fill the ruts, so the rut cutter would have to be used to keep these ruts in shape. Where loads went down hills, hay or straw had to be placed in the ruts to keep the load from going too fast (Ryan 1975,p.27-28).

The cut trees were piled on landings above the water and rolled over the edge, or stored at the lake level on ice landings. In either case, the cant hook was an essential tool for unloading and rolling the logs. In the spring, the logs were sent to the nearest large

body of water to be boomed. The boom “consisted of a series of large timbers chained together at the mouth of the watercourse where it entered the lake. These contained the emerging logs. Once enough of them had been collected, the boom was closed and preparations made to move it across the lake” (Corby n.d.,p.15).

Hilden described how a boom was worked during this period, although it was on the Rainy River to the west of Voyageurs National Park. Before Backus (of the International Lumber Company), according to Hilden, “logs were floated down stream to Baudette and Spooner to what we called four mile boom.” He explained that about 10 miles before Spooner (at Clementson) there was a shear boom, which was operated by the current. The boom was 100-150 feet long, and was made up of several booms. A man on a winch would pull the fins against the currents—as he pulled, the boom would move like a ferry boat. Following this, the logs were sheared into the boom at Clementson, and then driven down to the sorting works at Silver Creek. The timber of the various companies was put into separate “brails” (shafts or bins) by men using poles, who sorted according to the end stamp or bark mark (Hilden 6-12-76,p.7-8).

Early Logging Camps

The early phase of logging can claim the “shanty-boy” of song and poetry. Lumberjacks did, in fact, usually live in one room cabins or shanties, also known as the “state-of-Maine shanty” or simply the “Maine shanty.” Larson pointed out that the early loggers lived like one family in the shanties, where they took their meals and slept (Larson 1932,p.353). In northern Minnesota, an approximation of shanty life probably continued into the twentieth century in small operations and those run by jobbers (individuals with contracts to remove timber in a certain areas for logging companies). Shanty sites (early, small logging camps) have not yet been located in Voyageurs National Park. Elsewhere in northern Minnesota, archeologists have indicated that from surface evidence alone it is difficult to distinguish between small logging operations and homesteads.

Documentary evidence indicates that early camps existed at Kettle Falls. Beatty also mentioned Rat Portage Lumber Company camps in the vicinity of Voyageurs National Park (Beatty Nov./Dec. 1963,p.59), as has Drache:

By the 1890's the Rat Portage Lumber Company had five camps in operation on both sides of the border in the Kettle Falls area. Timber was floated down Rainy Lake, Rainy River, and Lake of the Woods to Kenora and in later years to the community of Rainy River (Drache 1983,p.18).

Drache described the casual nature of the international commerce in timber cut in the border country during this period:

Oliver Knox, whose parents came from eastern Ontario in 1903, took a job with the Rat Portage Lumber Company at Kenora. He was assigned to take horses from Fort Frances and then by barge to Kettle Falls, where he worked on either side of the border. Other lumberjacks came to the camp at Kettle Falls from all directions, and many were not even sure which country they were in (Drache 1983,p.18).

Because the camps during this period mainly were operated by Canadians, good descriptions of them might be found in Canadian archival sources. Drache, describing farming in the border country, has provided an intriguing comment that may pertain to camps that were located in Voyageurs National Park:

The lumber camps, the biggest local market, relied almost entirely on cattle and hogs imported live and butchered at the camp in the summer. In the winter dressed meat was imported. Oats and hay, also needed by the camps, had a good demand, and local production seemed imperative. In September 1892, I. A. Felter of Vermilion had over 100 tons of hay delivered to him for baling. Once it was baled into 80-pound wire-tied bales, the hay was barged in summer or sleighed in winter to interior lumber camps (Drache 1983,p.223).

The angst of life in the shanties often was put into song, although many of these songs had been carried west by lumberjacks coming to Minnesota. M. C. Dean of Virginia, Minnesota, sang the "Shanty-man's Life" for Franz Rickaby in the early 1920s.

Shanty-man's Life

- 1 A shanty-man's life is a wearisome one,
Although some say it's free from care.
It's the swinging of an axe from morning till night
In the forests wild and drear.
- 2 Or sleeping in the shanties dreary
When the winter winds do blow.
But as soon as the morning star does appear,
To the wild woods we must go.

- 3 At four in the morning our greasy old cook calls out,
 "Hurrah, boys, for it's day."
 And from broken slumber we are aroused
 For to pass away the long winter's day.
- 4 Transported as we are from the maiden so fair
 To the banks of some lonely stream,
 Where the wolf, bear, and owl with their terrifying howl
 Disturb our nightly dreams.
- 5 Transported from the glass and the smiling little lass,
 Our life is long and drear;
 No friend in sorrow nigh for to check the rising sigh
 Or to wipe away the briny tear.
- 6 Had we ale, wine, or beer our spirits for to cheer
 While we're in those woods so wild,
 Or a glass of whiskey shone while we are in the woods alone,
 For to pass away our long exile.
- 7 When spring it does come in, double hardship then begins,
 For the water is piercing cold;
 Dripping wet will be our clothes and our limbs they are half froze,
 And our pike-poles we scarce can hold (Rickaby 1926,p.45-46).

The Early Logging Landscape

The forests of the border country, with their wealth of white pine, captivated men who wanted to turn a fortune, earn a living, or capture an adventure. The grandeur of those forests must have been a glorious sight: the darkly magnificent stands of white pine, spruce, and fir trees, punctuated by the lightness of the ever-present aspen. As logging began in Voyageurs National Park, the forests begin to show thinning and clearing—obviously the work of humans and not fire or disease. Logging efforts were first concentrated on the banks of the rivers and streams that led to Canadian mills. As the period progressed, lumberjacks ventured farther into the forests, but not beyond reasonable skidding distance.

Trygg described the vegetation on the peninsula before it was logged:

The peninsula did not have the heavy stand of timber that was south of the lake although some areas were very good. Heavy stands of pine were mostly in the

Johnson Lake area and southward toward Cusson and eastward toward Vermilion and Echo rivers. Also up along the Duluth, Winnipeg and Pacific Railroad to Arbutus. When you get up further north there is more rock outcropping and a different type of soil. It did not have the heavy stand of pine. It was more jack pine, birch and aspen (Trygg 1975,p.15).

In the early logging period, little more than the white and Norway pine were logged. Other species were left for later lumberjacks.

The End of the Early Logging Period

As Larson noted, "The passing of the pioneer stage of logging cannot be precisely dated, for the change depended to a considerable extent on whether a given logging establishment was that of a small owner, or of a jobber, or of a man of 'big business'" (Larson 1932,p.358). She added that in the 1870s the more primitive methods of logging began to disappear; however, this is not to be confused with the passing of the first phase of logging, which for Voyageurs National Park coincided with the arrival of railroads in 1907. With their arrival, and the development of mills at Virginia and International Falls soon thereafter, it became economically feasible to fell trees in more inaccessible forests.

The passing of each phase of logging brought personal angst, as certain practices were supplanted by more efficient means, necessitating a new league of workers. Dan McNeil, who Larson claimed was "a noted ox driver in his day," expressed his sentiments in a poignant song. It probably first was published in *Travel* in February 1933 in an article by Stewart H. Holbrook entitled "With the Loggers of the Northwest." McNeil described how the passing of the early phase of logging affected one lumberjack.

Then I was king of the whole woods-crew,
 And I ruled with an iron grip.
 And never a slab on the whole dam' job
 Dared give me any lip.
 But now, alas, my days are past;
 There's no job for me here.
 My bulls all killed and my place is filled
 By a donkey engineer.
 Instead of my stately team of bulls
 All stepping along so fine,
 A greasy old engine toots and coughs
 And hauls in the turn with a line (Larson 1949,p.364).

4. SUB-CONTEXT 2: RAILROAD LOGGING AT VOYAGEURS NATIONAL PARK, 1907 - 1937

*It was an exciting area in which to work—and sadly, the
last frontier of the Middle West.*

Leslie Beatty⁴

Like the weather of March, this second phase of logging came storming into the border country like a lion, but passed as quietly as a lamb in the 1930s with the last log drives in Voyageurs National Park. By 1937 lumber companies were pulling up their rail tracks, the lumber mills at International Falls closed, and the International Lumber Company dissolved. Thirty years earlier, it was a different story.

Lumberjacks from Wisconsin, Michigan, and farther east began timber operations in northern Minnesota as fast as federal surveys could be accomplished, and sometimes faster. By the mid-1890s, land surveys were completed in the northern timber belt, and land began to transfer to private ownership. Surveys in the area encompassed by Voyageurs National Park mostly were completed between 1881 and 1884, although an area to the south and west of Lake Kabetogoma was not surveyed until the 1890s (Trygg 1966).

Logging changed irrevocably when the big logging companies that had been operating in other parts of the state, and exhausting the resources there, began to eye the vast timber reserves in Minnesota's northernmost counties. The area encompassed by Voyageurs National Park was one of the last regions of northern Minnesota to succumb to the new logging era, but first railroads and mills had to be built to serve the area. When that was accomplished, the early trickle of interest in border country lumber became a deluge.

In this second phase of logging, species other than white and Norway pine had a significant role in the logging economy. Emerging needs for pulpwood created a market for aspen, poplar, and jack pine. Thus, the impact on the landscape was even greater, and,

⁴ Leslie R. Beatty, "A Forest Ranger's Diary," *The Conservation Volunteer* (St. Paul: Minnesota Department of Conservation, November/December 1963), p.59.

in a clash of state laws and developing forestry practices, clearcutting and slash burning denuded the landscape to a greater degree than it had been in the earlier phase of logging.

This second phase of logging was highly dependent on better technology. The movement of logs was more complex because timber was being moved much greater distances over land. Railroad hauling was indispensable, but horse hauling and river drives still were important for part of the period. More efficient machinery, including motorized vehicles, improved the efficiency of many aspects of the procurement process.

In writing of the change in song in the Great Lakes logging region, Rickaby addressed the changes in logging technology and practice that ushered in logging's next phase:

A few years, perhaps ten, before 1900, it was evident that some grim change was taking place, killing the song in the hearts of workers, not only in the forests, but abroad in the world as well. . . The complexion of the shanty crews changed. Where once had been the free-moving wit, the clear ringing voice of the Irishman, the Scotchman, the French-Canadian, there appeared in greater numbers the stolid Indian, the quiet, slow-moving, more purposeful Scandinavian. . . In place of the old unattached shanty-boy, whose sole home was the camp, came more and more the men from the farms, men who tended to save their money and whose morals were more or less safely anchored in homes to which they returned in the spring (Rickaby 1926,p.xx-xxi).

The "grim change" described by Rickaby was brought about by the introduction of more mechanized processes. This new efficiency was brought to the north woods by the big lumber companies that came to dominate the industry there.

During this phase, the border lands were inhabited, exploited, and industrialized. International Falls was platted in 1905, and Koochiching County was incorporated a year later. The Backus-Brooks Company, with a significant presence in International Falls, dominated the economy of the region to the west of Voyageurs National Park and, with mills at Virginia and Cusson, the Virginia and Rainy Lake Company dominated the area to the south. Thus, it was the Virginia and Rainy Lake Company and the International Lumber Company, a subsidiary of the Backus-Brooks Company, that were most responsible for changing the landscape of the area now encompassed by Voyageurs National Park. They were the dominant land owners in the area that became the park, and operated industries dependent on the lumber the land contained.

The Virginia and Rainy Lake Company

Several historical accounts of the Virginia and Rainy Lake Company have been written, so only a brief summary will be presented in this report. Duane W. Eicholz wrote *The Virginia and Rainy Lake Logging Company* (International Falls: Public Library, n.d.). Duane A. Krenz wrote *An Historical Geographical Study of the Virginia and Rainy Lake Company, the Last Major White Pine Operation in the Great Lakes Region*, as a master's thesis (Mankato State College, 1969). Another master's thesis on the subject was written by Kenneth W. Perala, who included a chapter on the Virginia and Rainy Lake Company in *The History of Logging in Selected Areas of St. Louis County* (University of Minnesota-Duluth, 1967). David Fritz's *Special History Study on Logging and Lumbering* provides an historical overview, plus information on the company's operation in the area that became Voyageurs National Park (Denver: NPS, Denver Service Center, 1986).

The magnitude of the Virginia and Rainy Lake Company operation was eloquently expressed by Frank King:

The Virginia and Rainy Lake Company, operator of the largest white pine sawmill in the world, at Virginia on the famed Mesabi iron range, cut its last log in October 1929 after 20 years of operation. This giant mill, capable of turning out 1 million board feet of lumber a day when working two shifts of ten hours each, had an annual production capability of over 300 million board feet of lumber and related products. Its operation required the transportation services provided by some 140 miles of main line railroad equipped with 14 locomotives and some 350 log cars (King 1981,p.26).

Until a means of transporting timber from the border forests to the lumber mills farther south in the state could be provided, it was untenable to log the last great white pine reserves in the state. In 1902 Wirt Cook and William O'Brien organized the Duluth, Virginia, and Rainy Lake Railroad (later named the Duluth, Rainy Lake, and Winnipeg), projected to extend from Duluth to Rainier. By 1907 all but 21 miles of the route between Virginia and Rainier had been laid. In 1907 the railroad was purchased by the Canadian Northern Railway Company, and by 1909 the track to Rainier was completed. The road later became part of the Canadian National Railway System (Krenz 1969,p.38-42).

After rail transportation made an ingress into the northern regions, interest was stimulated in logging the last big reserves of white pine in the state. With that motive in mind, the Virginia and Rainy Lake Company was formed in 1908 by giants in the Great Lakes lumber industry: William O'Brien and Wirt Cook, who controlled the Rainy Lake Company, a holding company with subsidiaries concerned with lumber, construction and railroad operations; Edward Hines, "owner of the largest wholesale company in the United States during the period;" and Frederick Weyerhaeuser, whose interests in northern Minnesota included the Northland and Pine Tree companies and three lumber companies in Cloquet (Krenz 1969,p.33-34). With their combined interests, the new company owned huge quantities of stumpage in far northern Minnesota.

The Rainy Lake Company (Cook and O'Brien) had negotiated an agreement, shortly before the merger that created the Virginia and Rainy Lake Company, which allowed it to use the Duluth, Rainy Lake and Winnipeg Railway track, with a charge on a per car basis. This agreement was instrumental in the success of the new-formed Virginia and Rainy Lake Company, and stayed in place for the history of the company (Krenz 1969,p.38-42).

In 1909 the Virginia and Rainy Lake mill began operating at Virginia, Minnesota, and became the largest white pine sawmill in the world (Nute 1950,p.91). The basis of the company's operation were the former facilities of the Rainy Lake Company. An existing labor force and proximity to railroads and forests were other factors that prompted the selection of Virginia as the seat of the Virginia and Rainy Lake Company's sawing operations. An excerpt from Krenz conveys something of the scope of the company, and its enormous appetite for lumber:

The entire operation covered approximately 300 acres and consisted of three large storage yards that held an estimated 90,000,000 board feet of lumber at all times. The storage yards were interspersed with about sixty miles of narrow gauge track and seventeen miles of tramway where small electric battery operated cars transported lumber to and from the various mills. The tramway were elevated tracks constructed to increase the capacity of the yards (Krenz 1969,p.49).

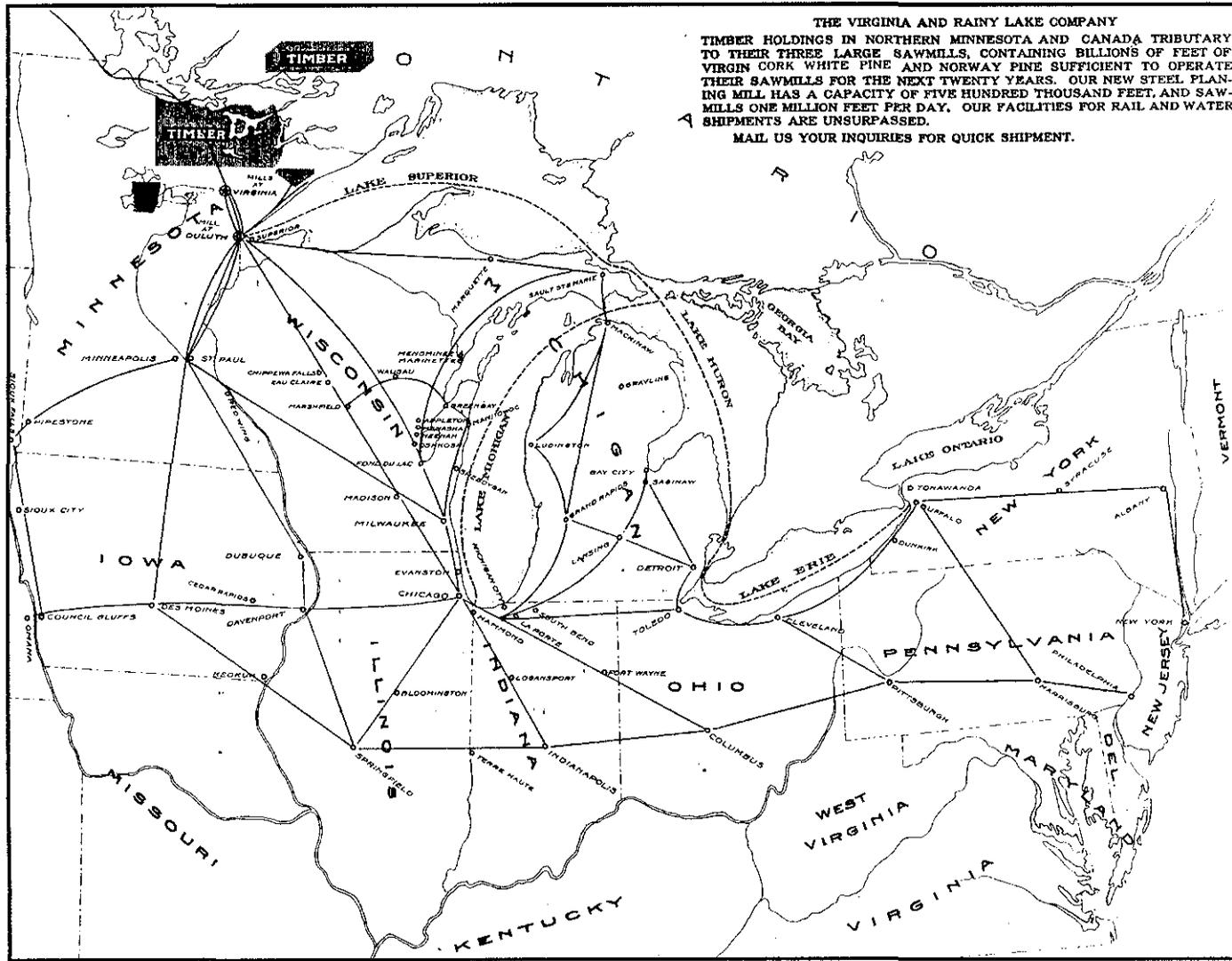


Figure 4: Timber lands of the border country. The back of the Virginia and Rainy Lake Company stationary featured this map, highlighting the timber lands of the border country. The letter was dated 5-28-23 (*Minnesota Historical Society*).

The railroad headquarters of the company was at Cusson, a village it developed about 50 miles north of Virginia on the Duluth, Winnipeg, and Pacific line (Nute 1950,p.92). All railroad operations emanated from Cusson and, considering that over the life of the company it built about 2,000 miles of spurs, this was a significant operation. Nute wrote the following about Virginia and Rainy Lake Company track laying:

Two steel gangs did nothing but pick up and re-lay tracks as logging was completed in one area and begun in another. In addition, about a hundred miles of sleigh roads were graded every year, over which logs were hauled to the nearest rail branch or main line. There were fourteen standard locomotives, ten steam log haulers, and numerous gasoline boats, besides three loading cars, fifteen handcars, a sliding log loader, a Bucyrus steam shovel, three hundred and forty-five flatcars, snow and gravel plows, a pile driver, other cars, and cabooses (Nute 1950,p.93).

In the first season of its operation (winter 1909-10), the Virginia and Rainy Lake Company hired 2,000 men between September and April, not including mill workers (Nute 1950,p.92). During its 20 years of operation, the Virginia and Rainy Lake Company manufactured approximately 2,500,000,000 feet of lumber at a cost of about \$30,500,000 in logging and railroad operations. The company, on the average, was maintaining 15 camps at any one time, each housing about 150 men, and maintaining 18 teams of horses (Nute 1950,p.93).

The wages of lumberjacks were 60% of the cost of logging, according to Frank Gillmor. He remembered that the Virginia and Rainy Lake Company had an employment office in Duluth—it advanced workers the rail fare to Cusson, then took them to the logging sites. The company prided itself on treating its workers well. Besides keeping the camps clean, the VRL Company installed bathhouses at the camps and kept the bunkhouses warm by having watchmen tend the fires at night. Consequently, the famous strike in the winter of 1916-17 that was instigated by the International Workers of the World (“Wobblies”) had a minimal impact on the VRL operation. About 1,000 men who went on strike were brought out of the woods in box cars sent out by the company. They were only on strike for four or five days (Gillmor 7-24/25-48,p.2).

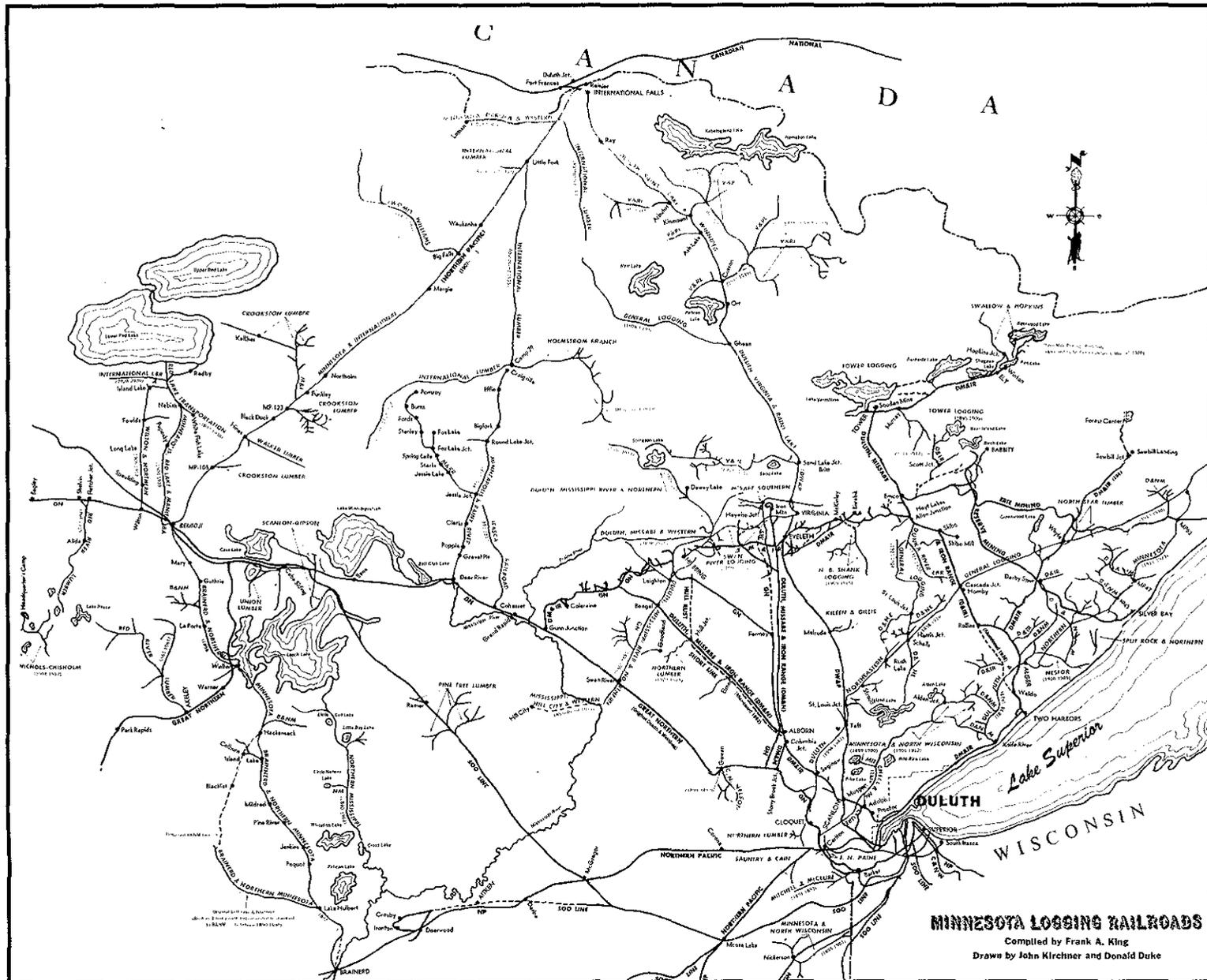


Figure 5: The logging railroads of northern Minnesota. Franklin King's book *Minnesota Logging Railroads* provides a historical overview of railroad logging (1981).

The Virginia and Rainy Lake Company did not only hire lumberjacks directly, it also negotiated contracts for the completion of certain jobs. According to Gillmor, it “let contracts for station work—cutting, grubbing stumps, poling swamps, getting the spur lines ready” (Gillmor 7-24/25-48,p.4).

The Virginia and Rainy Lake Company was certainly a presence in the area that became Voyageurs National Park; however, it probably operated more profitably in more accessible areas. David Fritz found that during its 20 years of operation, the Virginia and Rainy Lake Company built 31 camps in the vicinity of the future park (28 sites are within the park boundaries). Eighteen were located on the Kabetogama Peninsula and 13 were on the mainland. Fritz calculated that only 12.3 per cent of the Virginia and Rainy Lake total production was cut from the camps located in Voyageurs National Park, and the camps on the Kabetogama Peninsula were costlier to maintain, driving up the cost of the lumber obtained there. In order to understand why it was so expensive to log in the border country, it helps to understand the logging process—explained later in this chapter.

E. W. Backus and the International Lumber Company

Edward Wellington Backus came to Minnesota at age 17 in 1878 and began working in the lumber industry a few years later. By 1885 he owned his own company, the E. W. Backus Company (later the E. W. Backus Lumber Company).

Throughout the 1890s the Minneapolis-based lumber industry ebbed and flowed, with fires and the depression of 1893 dogging the industry, but Backus ultimately thrived. In 1895 he had 600 men employed in logging operations alone (Larson 1949,p.367). In 1899 Backus cut 96,000,000 feet, putting the company in third place among Minneapolis mills in this record year of production (Larson 1949, p. 243). That same year, Backus merged his interests with William F. Brooks, forming the Backus-Brooks Company. Backus-Brooks began buying holdings in northern Minnesota, both large and small. As Rossman so eloquently described, Backus’ success was due, in part, to his ability to foresee the next profitable move:

As the 90's were coming to their close, it was obvious to Edward Backus that the forests along the Mississippi and the south flowing waters would soon be exhausted. . . The young lumberman also looked at the great falls of Koochiching where the Rainy River tumbles over rocks in a white foam and with a force of 25,000 horses. In woods and water there was a challenge to ambition (Rossman n.d.,p.8).

In the winter of 1897-98, Backus travelled to the border country and found the potential for water power on the Rainy River and ample stands of white pine in the northern forests. Near the end of his life, as he stood in federal court trying to wrest back control of his company, Backus reminisced about his first glimpse of the falls that were the cornerstone of his industry. Fred Hilden, who worked for the International Lumber Company and later the Minnesota and Ontario Paper Company from 1915 to 1958, told the story years later:

(Backus) got up and told the story of his life, how he happened to come here. That was the time that Bemidji was the end of the line. They drove a team of horses across the country and stopped at the various settlers on the way to Koochiching Falls. He told about coming here to what was Koochiching and stood on the banks of the river, Koochiching they called then, and viewed those falls. It was just a set of rapids. There was no dam at that time. He says, as I viewed the falls, I decided that here was where I was going to spend my future, right here in International Falls. You could have heard a pin drop when he talked. He stood there and he pulled his eyebrows, I can see him yet (Hilden 6-12-76,p.19-20).

In about 1900 Lyman W. Ayer began cruising for Backus-Brooks. He was known for his deep knowledge of the woods, his endurance, and his accurate judgment regarding timber stands (Larson 1949,p.170). From 1902 to 1904 he travelled through the border country to assess the timber reserves for Backus-Brooks. From the report Ayer submitted to Backus, it is evident that he travelled through at least a portion of the area now encompassed by Voyageurs National Park. The report must have been a critical factor in determining the location of Backus-Brooks' operations over the next few years. According to Ayer's appraisal, the Minnesota border country contained 11,179,500 cords of spruce, with another seven million across the border in Canada (Drache 1983,p.67). Drache's impressions of the impact of Ayer's report on Backus were:

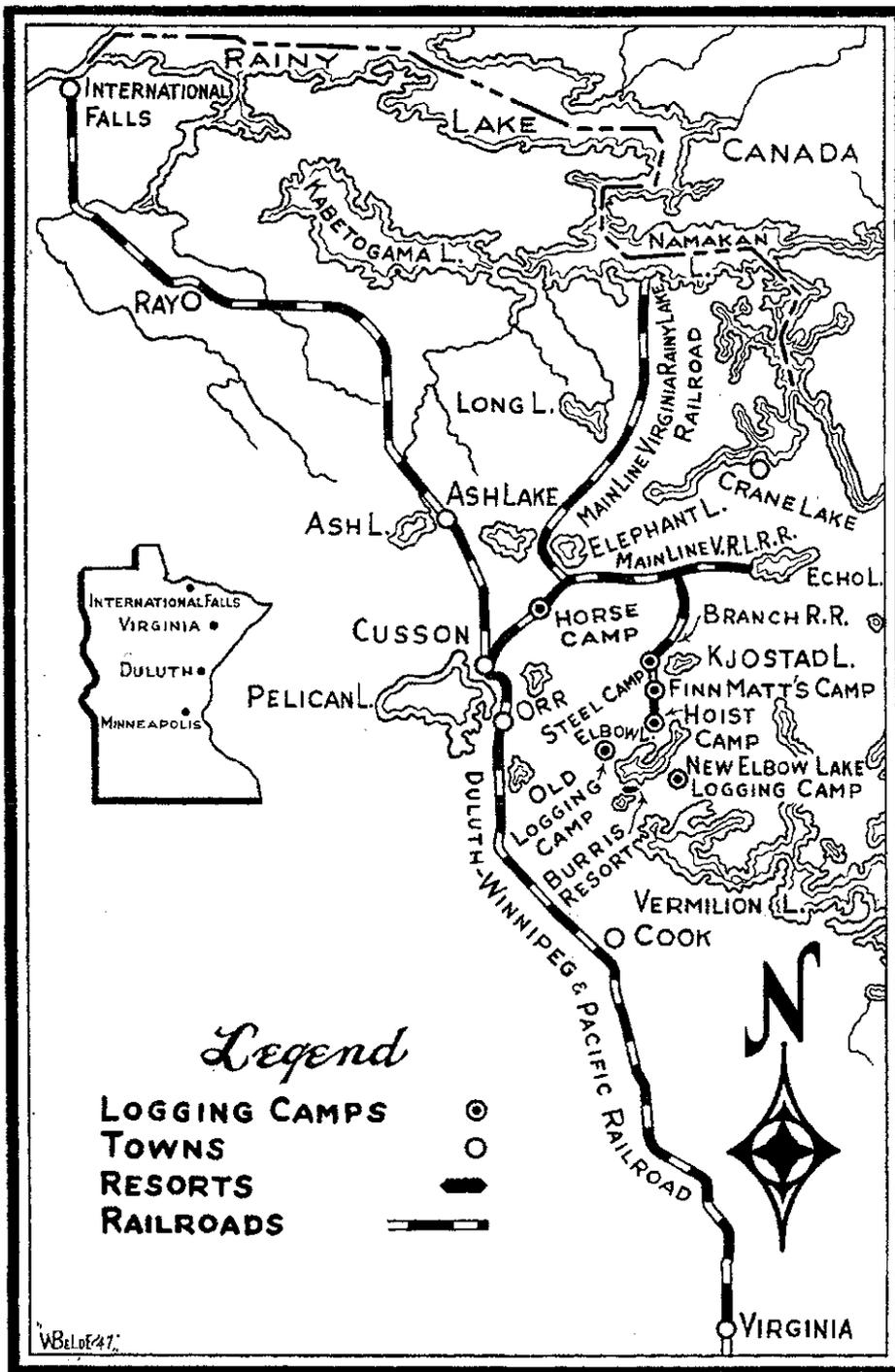


Figure 6: Routes of main railroad lines north of Virginia, Minnesota. This map was included in *Time in the Timber*, the reminiscence of C. M. Oehler about his job as a clerk with the Virginia and Rainy Lake Company in 1928. Although the camp locations are not complete, the map shows other features that existed about the time the Virginia and Rainy Lake Company ceased operating (C. M. Oehler, *Time in the Timber*, 1948).

With the data from Ayer's expert estimations E. W. Backus could dream of building an empire in the woods. He may have appeared as a wild visionary when he first arrived in Koochiching, but by the time mill construction commenced, he and his associates realized that it was not a dream but a reality. However, it would take great courage and millions of dollars before this empire could be built. Backus and his associates were well on their way to achieving their goals before the general public had any conception of what was happening (Drache 1983,p.67-68).

In 1900, Backus and his associates obtained the rights to the site that became International Falls, so named in 1904 (Drache 1983,p.63). In the first few years of the twentieth century, Backus-Brooks laid the groundwork for a mill at International Falls. The company obtained permission from the Canadian and U. S. governments to build a dam to harness the water power, and it stimulated the development of rail service to the region. Backus-Brooks continued to accumulate land and cutting rights on both sides of the border. Larson wrote that the land they acquired was "in the most remote and unexplored regions of northern Minnesota" (Larson 1949,p.170).

In 1905 construction on the dam began. One account of the ensuing progress follows:

By late 1907, work was more than half completed and \$750,000 had been spent, when difficulties arising from increased labor and material costs caused work to be suspended. Time under the original permit was running out and an extension was sought. Sometime in 1908 a three-year extension in which to finish the work was finally secured and the dam was completed in 1910 (Comeau 1950,p.3).

In 1907 the Minnesota and International Railway extended a line from Bemidji to International Falls, and the Duluth, Rainy Lake and Winnipeg road was completed from Duluth to Fort Frances and Ranier (Comeau 1950,p.28). The Backus company developed a local common carrier, the Minnesota, Dakota and Western, which connected with the Minnesota and International Railway at International Falls and with the Duluth, Rainy Lake and Winnipeg at Ranier Junction. It served Backus' various interests in International Falls and connected with the International Lumber Company's logging railway complex (King 1981,p.128). King wrote about the extensive network of rails developed by the International Lumber Company:

Backus' International Lumber Company constructed and operated an estimated 1,000 miles of logging railroads over its 28-year lifespan from 1909 to 1937. During peak operations in 1917 the company operated 11 locomotives, some of which undoubtedly came from the Minnesota, Dakota and Western, and 150 logging flatcars, as well as a number of other items of rolling stock, including cabooses, steam shovels, work cars, and fire fighting cars. The greatest logging railway mileage was attained during 1928, when 150 miles of main line and 70 miles of spurs were in operation. Besides hundreds of millions of board feet of logs hauled to the sawmill at International Falls, the logging railroads carried, between 1914 and 1937, some 2 million cords of pulpwood, or an average of 5,000 carloads a year (King 1981,p.129).

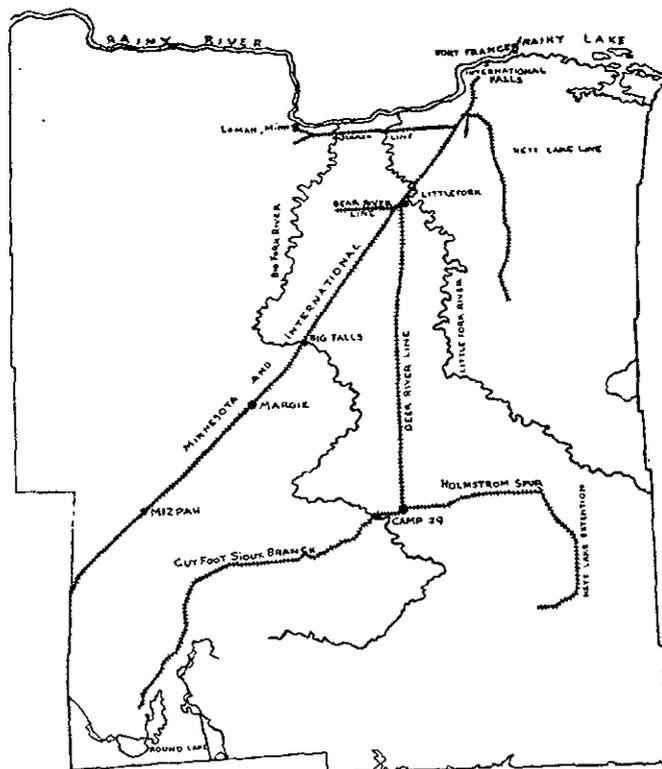
The Backus-Brooks Company was incorporated as the Minnesota and Ontario Power Company in 1908, and later became the Minnesota and Ontario Paper Company (often called "Mando"). It had several subsidiary companies, including the International Lumber Company (formed in 1911), the Minnesota, Dakota, and Western Railway Company, the National Pole and Treating Company (formed in 1926), and The Insulite Company (formed in 1930). All of these operated out of International Falls. By October 1910 Mando was operating a mill that soon had four newsprint machines, and two years later it began operating a somewhat smaller newsprint mill across the river at Fort Frances, Ontario (Comeau 1950,p.5).

The International Lumber Company was formed in 1911 to supply other Backus subsidiaries with raw material—timber and pulpwood. According to a corporate history issued in 1950, "The wood supply for operations at International Falls was provided from timber and pulpwood areas tributary to International Falls, and was largely supplied from lands latterly owned directly or indirectly by the predecessor company (Mando), and from lands of the State of Minnesota and to others upon which licenses to cut timber were readily procurable" (Main 1950,p.3).

In 1913 Backus began building dams at Kettle Falls. "The purpose of the two dams was to store a head of water in Kabetogama, Namakan, Sand Point, Crane, and Little Vermilion lakes, the body to be known as the Namakan Reservoir. From this storage basin, water would be released for power generation and manufacturing in the Backus paper mills at International Falls and Fort Frances, Ontario" (Beatty Nov./Dec. 1963,p.59).

The International Lumber Company cut some wood for its paper mills on the Kabetogama Peninsula, although the main focus of its cutting seems to have been to the south and west of International Falls. The peak year of logging by International was 1917. It operated 23 camps and employed 4,000 men that year (Comeau 1950,p.5). The company operated until 1937 (Nash et al. 1983,p.12).

The International Lumber Company operated camps until its demise, then the Minnesota and Ontario Paper Company continued operating camps. In Voyageurs National Park some camps were located on the Kabetogama Peninsula. By the end of the International period, the camps were luxurious compared to its earlier camps—comfortable, light, warm, and relatively spacious. Mando operated camps until 1936, then begin contracting with independent operators who operated camps on the Kabetogama Peninsula until 1964.



NORTHERN MINNESOTA LOGGING RAILROADS OF THE MINNESOTA AND
ONTARIO PAPER COMPANY, 1910-47

Figure 7: *The International Lumber Company logged in Koochiching and St. Louis counties. It used railroads for its logging operations until after World War II (Grace Lee Nute, Rainy River Country, 1950).*

The Logging Process in the Railroad Era

Although saws improved somewhat during this phase, the actual process of *cutting* trees remained about the same until power chain saws came into use in the third phase of logging. O'Meara provided an eloquent description of cutting:

Comes the undercutter with his beautiful, double-bitted ax. His calculating eye runs to the upper branches of a century-old pine; he notes its lean, its field of clearance; he checks the wind's direction. Then, at precisely the proper point, his ax sinks into the rough, clean, cork-like bark.

The undercutter's strokes have a deadly, professional accuracy; the kerf left by his blade is as smooth as paint; the chips that fly out upon the snow are as large as a man's hand, and cleanly curved. The pine is quickly and deeply notched *on the side toward which it is to fall*, and the undercutter, pausing for a chew of tobacco, gives over to the sawyers.

The big crosscut saw, six feet long, goes to work on the opposite side of the trunk, at a point several inches above the lowest part of the undercut. It *clangs* rhythmically as the mittened hands of the sawyers draw it back and forth. At each pull of the saw the teeth bite through half a dozen annual rings—half a dozen years of growing. . .

Presently the great hand of steel is buried in the tree; when it is completely out of sight, the sawyers drive steel wedges into the kerf. One of them takes from his hip pocket a whiskey flask encased in sheet metal; it contains kerosene which the sawyer pours on the saw to dissolve the pitch, the oozing life-blood of the pine. They resume their sawing, and at the end of each long, steady stroke their breath rises in a little white cloud on the frosty air.

. . . Suddenly comes the warning *cr-r-ack!*—sharp and crisp, like the report of a rifle. A few more strokes of the saw, and then a rending, tearing sound; the death rattle of the great tree. "Timber-r-r-r!" The traditional cry, half in warning, half in triumph, rings thinly through the woods; and the sawyers, looking to their footing, step away from danger, while all in the direction of the tree's fall scurry for safety.

The pine, however, does not come down at once; it hesitates, trembles, seems to resist the wordless indignity it is about to suffer. . . Slowly, very slowly at first, the great trunk begins to totter, to lean a little in the direction that the under-cutter, with the first stroke of his ax, determined it should fall. Then faster, as fibers snap and rend. The branches moan their protest as they sweep downward through the high air; the moan grows now to a whistle—to a shriek—as the big green-top gathers speed.

The crash, of course, is tremendous, as the great pine comes to earth in clouds of snow and showers of broken twigs and branches. But the litter settles down, the branches of the fallen tree wave up and down for a little while, from the impact of the fall; then everything is still again, and the swamper comes to do his work (O'Meara 1947,pp.121-123).

The swamper removed the brush from the fallen pine, then the undercutter returned, this time to mark the cuts for logs. O'Meara stated that white pine was usually cut in 16 foot lengths, although cuts ranged from 12 to 20 feet. Red (Norway) pine was cut in 12 to 38 foot lengths (O'Meara 1947,p.123).

Felled logs were skidded to a skidway, loaded onto trains or sleighs, then taken to a landing where they were stored until the spring thaw. In the spring they were driven to a hoisting site, where they could be loaded onto flatcars, then taken to Virginia, International Falls, or another mill. Drives persisted in the border country until the end of this phase of lumbering. The many lakes and rivers continued to be obstacles that were easier to travel through, instead of over or around. Eventually, however, the construction of spur lines to river and lake landings greatly facilitated hauling.

The significance of the construction of dams in the Rainy Lake region cannot be overemphasized. The Backus coffer dam at Koochiching Falls (International Falls) finally was finished in 1905, allowing the magnate to control the level of Rainy Lake and harness water power for his operations at International Falls (Drache 1992,p.306).

In 1911 Congress approved a bill that authorized the construction of a dam at Kettle Falls (such permission had been granted in 1898, but the time had lapsed for its completion). Then, according to Drache, "in April 1912, the Rainy River Improvement Company, an M & O subsidiary, applied to the International Joint Commission for approval to build dams at Kettle Falls. The purpose of these dams was to hold water back for easier sluicing of logs in the spring, and to allow for the lowering of Sand Point and Namakan lakes for an additional 5 feet to keep a greater flow of water over the Koochiching power dam in the dry season" (Drache 1992,p.276). Construction of the dam was completed by 1914 (Drache 1992,p.276). Together with a dam at Squirrel Falls in Canada, the Kettle Falls dam was an important control mechanism. Drache explained how the dam helped:

. . . two sets of rail tracks were laid by Fred Lassard to aid portaging between the lakes. One set of tracks circled the dam and was capable of transporting tugboats called "gators," while the other ran behind the hotel but connected the lakes. These tracks were particularly useful to commercial fishermen . . . the tracks were removed when commercial fishing declined after 1920 (Drache 1992,p.276).

Drache concluded that the dams "still serve as a vital link in the water control system, monitored by the International Joint Commission" (Drache 1992,p.277).

About 500 horses were brought from the Red River Valley in western Minnesota by the Virginia and Rainy Lake Company in the early years of the company's operations. Horses were obtained from road contractors who did not need them in the winter months (Hilden 6-12-76,p.12). The horses were used to pull sleighloads of logs from the woods to the lake or river edge, to be hoisted on rail cars or driven down river in the spring (*Rainy Lake Chronicle* 3-2-75,p.6).

Much of the timber in the Voyageurs National Park area had to be towed across lakes in booms before it could be hoisted onto flatcars and hauled out. The booms probably were towed by steamboats. During the railroad era, the process was helped by the flat-bottomed scows known as alligators or gators. They were equipped with a steam or gas powered drum with up to a mile of cable and a heavy anchor (up to 1,000 pounds). Ryan described the role of gators and the challenges of moving booms:

The gator would run out ahead of the boom of logs, drop the anchor, and on its way back to the boom would reel out the cable from the anchor. Then, with the gator attached to the boom, it would reel in the cable and move the logs in the direction of the anchor. This was repeated until the boom of logs arrived at its destination. . . Wind was a big factor in moving logs, and sometimes crews just had to drop anchor and try to hold the boom until the wind died down or shifted—and sometimes had to tie up to shore in order to hold a boom from getting away . . . sometimes booms were tied up for several days waiting out bad weather, as no one wanted to take chances on losing a boom (Ryan 1976,p.31).

Another method of moving logs was by horse headworks—a long raft on which was mounted a capstan. A horse was hitched to each of two long arms that extended from the capstan. A smaller boat went out ahead of the boom, the crew dropped the anchor, then reeled out the rope as they returned to the headworks. Then the horses walked around the capstan, and as the rope was wound, the boom moved up to the anchor. The anchor was

lifted from the water and put back onto the small boat for another trip. The booms were held in place by logs that were strung together with chains (Ryan 1976,p.31-32).

Logs eventually got to the hoist, where they were lifted onto railroad flatcars to be taken to the mills. In the case of the Virginia and Rainy Lake Company, the railroad line went as far as Hoist Bay on Namakan Lake, reaching there in 1913. Beatty reported that along the extension of the line to Hoist Bay, several logging camps were built. In the winter logs were sleigh hauled to the hoist from the nearer camps, and in the spring and summer, logs from farther out were driven in booms to the hoist. In either case, the logs were then hoisted onto the flatcars and moved to Cusson over the company lines, then to the mills at Virginia on the lines of the Duluth, Winnipeg, and Pacific Railroad—an 86 mile rail haul (Beatty Nov./Dec. 1963,p.59).

Oswald Johnson wrote that Hoist Bay served camps 80, 84, and 85. The camp at Hoist Bay (#75) housed about 100 men (Johnson 7-31-81,p.2). Logs were pulled to the hoist by gators, then the hoist would operate as follows:

At Namakan Lake, the hoist itself was built out over the water. A railroad trestle holding empty flatcars extended out over the water beyond the steam powered jammer which did the hoisting. The machinery was made by the American Derrick Company. The jammer was equipped with a vertical coal fired steam boiler and a single drum hoist for lifting logs onto the cars and a low speed winch drum for pulling up empty flat cars for loading if a switch engine was not available. A string of Russell flatcars with a locomotive attached would normally be on the trestle during hoisting operations. Russell logging cars were used because they were capable of maneuvering the sharp bends present on the temporary railroad lines. Eight to ten cars completed a train.

The hoist had about thirty feet of boom forward to load the logs which were above the rails with bracing on each side high enough so a string of empty flatcars could be shoved through on the track under the jammer and loaded as they were pulled back to the loading position in front of the jammer (Graves 1983,p.3).

The hoist at Hoist Bay was not the only hoist operation of the Virginia and Rainy Lake Company, although it seems to have been the only one located in the area now covered by Voyageurs National Park. Nute stated that the company had hoists on Rainy, Namakan, Kabetogama, Elbow, Black Duck, Johnson, Beaudoin, Ash, Elephant, and Echo lakes (Nute 1950,p.93). There probably was a hoist at Ranier on Rainy Lake, where logs from

the northern part of the peninsula (camps 136, 137, and 143) were hauled over the snow by sleigh in 1928 and 1929 (Fritz 1986,p.83). If there was a hoist on Kabetogama Lake, its location is not known at this time. Fritz and Nute seem to disagree on this point.

Although the Tower Lumber Company (bought by Alger-Smith in about 1910) used a steam hauler as early as 1900, they were not common in the north woods until several years later (Beatty March/April 1962,pp.2-3). In about 1913 the steam hauler began to be used to haul logs to railroad spurs. The Virginia and Rainy Lake Company had 10 steam haulers. Bryant described the steam hauler as follows:

The essential features of the hauler are a locomotive-type boiler mounted on a heavy reinforced channel-iron frame, which also supports the cab and coal tender at the rear. The machine is supported in front on a narrow tread sled, which is so constructed that it may be run either forward or backward. A pilot, who sits on the front of the machine, steers the hauler by means of this sled.

The weight of the machine rests chiefly on two special traction devices placed under the rear end of the boiler. Each consists of a heavy steel runner, hung on a 4-1/2 inch shaft and equipped on each end with a heavy box in which runs an iron shaft carrying a heavy steel sprocket wheel. Each set of sprocket wheels meshes into and carries an endless tread chain 12 inches wide and 14 feet long, which is armed with calks and furnishes the tractive surface. . .

The boiler which is equipped with locomotive boiler attachments is 15 feet long, 36 inches in diameter and is built for a working pressure of 200 pounds. The water tank is placed under the boiler directly in front of the fire box and has a capacity of ten barrels, which will run the hauler for 5 miles. . .

The log hauler weighs from 17 to 22 tons when loaded with fuel and water. The average cost is \$5000 each (Bryant 1913,p.173-174).

Steam haulers in Minnesota were fueled with wood, and water had to be replenished at three to five mile intervals. Bryant noted, "In Minnesota, trains of nine sleds, each bearing 12,000 feet of white and Norway pine, have been transported by one hauler" (Bryant 1913,p.176).

Bryant described the advantages and disadvantages of steam haulers over animal hauling. Advantages included the ability to operate day and night with two crews at a lower cost. He pointed out that "annual depreciation and repairs are less than the depreciation on an equivalent number of animals; the necessity of bringing in large

quantities of feed is obviated." A disadvantage was that "the cost of road construction for log haulers is greater than for animals because stronger bridges must be built, steep downgrades side-banked and timbered, and all curves strongly sideskidded to prevent the sleighs leaving the road" (Bryant 1913, pp.174-175).

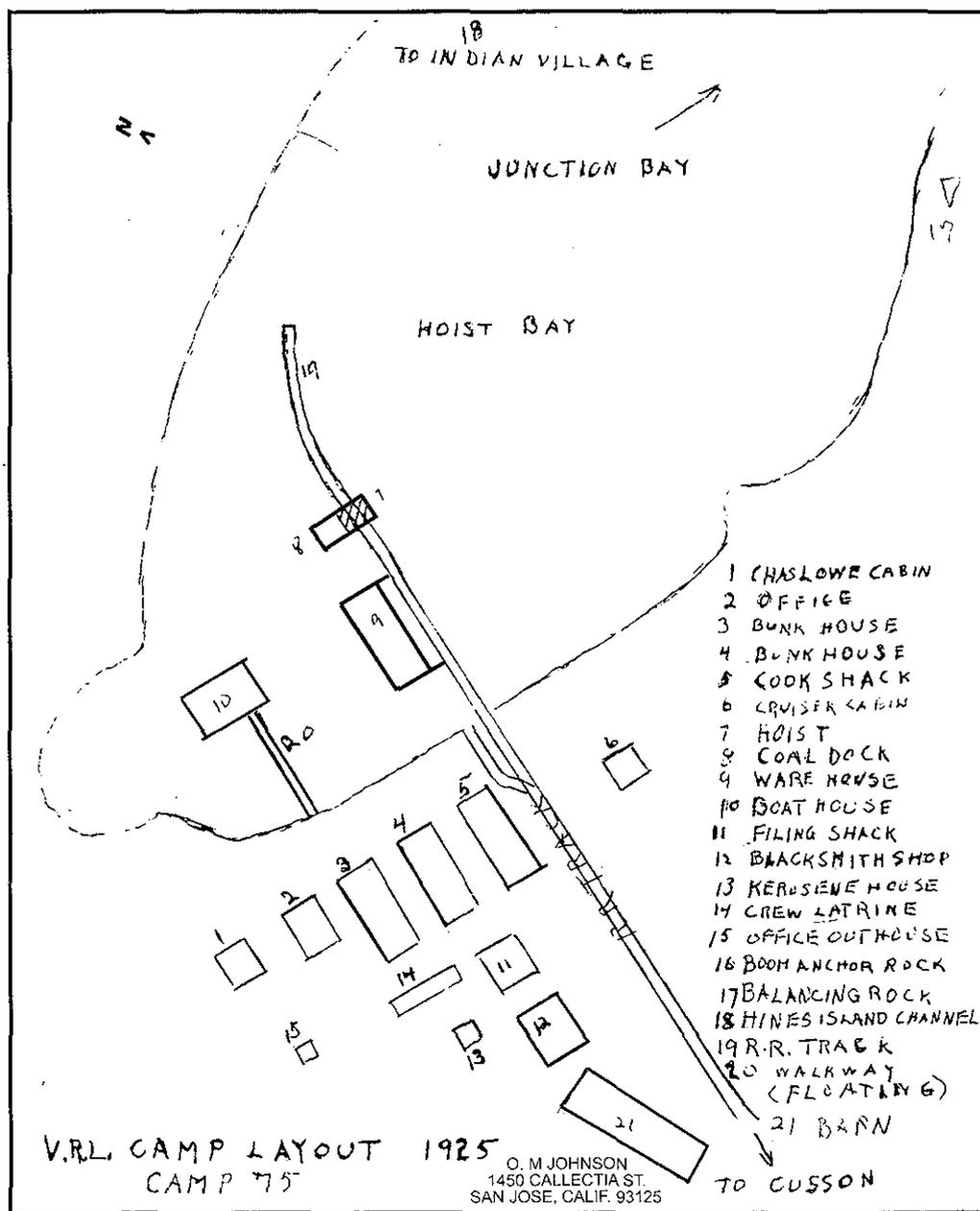


Figure 8: Virginia and Rainy Lake Company camp layout, Hoist Bay, 1925. Oswald Johnson drew this plan from memory many years later (*Voyageurs National Park*, files).

Steam haulers eventually were replaced by tractors and caterpillars—powered by gasoline engines. The Holt caterpillar was introduced in 1917, and the International Lumber Company got its first Holt tractor in 1920. It built up a small fleet for use in the Northome area, but in the early years of their use repairs were chronic. As improvements were made to the vehicles and as trained operators became more available, horses became a more expensive proposition. Drache noted the efficiency of the new machinery:

Within a few years, small tractors were used to pull 5 sleighs, and RD-7 Caterpillars could pull 10 sleighs, replacing 2 to 4 horses and 1 driver for each sleigh. By the mid-1930s, one tractor could move as much timber in one day as a team could in several weeks, and the end was not yet in sight (Drache 1992,p.328).

Oswald Johnson was a well-known Virginia and Rainy Lake Company “cat-skinner,” or caterpillar operator. He wrote about driving across the ice on Black Bay in 1925, but the exact years the company replaced its steam haulers for caterpillars has not been determined (Johnson 6-1-81,p.5).

Railroad Era Logging Camps

During the railroad era of logging, camps were bigger and more comfortable than earlier camps. The early camps were comprised of log structures, but by 1915 most camps were built of sawn lumber. Besides this difference in construction method, the camps functionally were the same, exhibited the same layout and siting, and had the same collection of buildings.

The Virginia and Rainy Lake Company maintained three types of camps: construction camps, sleigh haul camps, and hoist or railroad camps. The function of each type of camp dictated its siting and size and, to some extent, its layout (see Chapter 6).

Ryan wrote that by 1915 most camps were built of lumber, instead of logs. The lumber-built structures often were sheathed in tarpaper—both exterior walls and roof. The bunkhouses slept fewer men, and often had attached bathhouses for laundry and personal washing. Some camps had separate laundry buildings. By the mid-1920s many camps had electric lights.

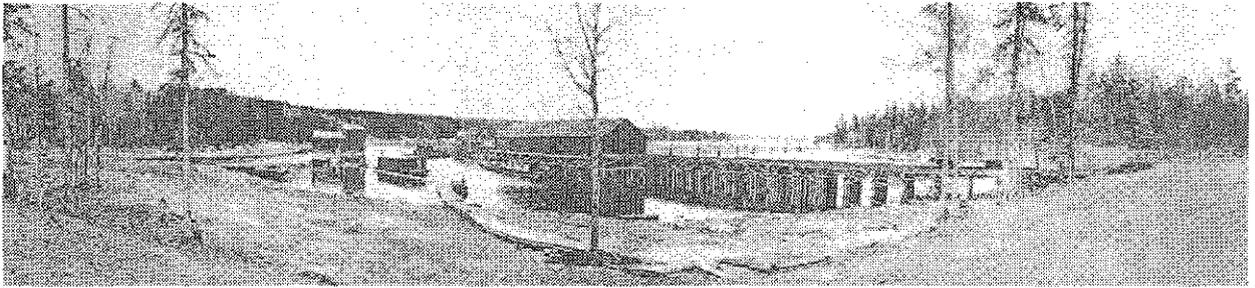


Figure 9: *Hoist Bay, Namakan Lake, 1923 (Minnesota Historical Society).*

Alex Gerber described the buildings in the early days of the Virginia and Rainy Lake Company as inferior to later structures. He said the early VRL camps were built of “number five lumber” and sheathed in tar paper. At a camp that had about 200 men, there would have been two bunkhouses, as well as barns, an office where the foreman and clerk also slept, the filing shack (where saws were filed), and the cook shack (Gerber 8-7-75,p.3).

By the final days of old-time logging in the far north, the lumber camps had improved significantly. Larson visited a Virginia and Rainy Lake Company camp in 1934, “traveling as far as possible by automobile along Rainy Lake and then by motorboat for almost half a day before reaching the camp, which was located near the water.” She described the camp as follows:

These camps were fresh and well kept; they were light and airy, with big windows and doors carefully screened. The spacious sleeping houses had iron bedsteads, quite unlike the old muzzle-loader bunks. Hot and cold running water, shower baths, and electric lights made one forget all about the old State-of-Maine camp, which Minnesota loggers had first known (Larson 1949,p.401).

Notes regarding Larson's trip to the camp are not contained in the Larson archival materials at St. Olaf College. This is unfortunate because they might have provided more explicit descriptions of the camps than her book does.

According to an historical account published by the Minnesota and Ontario Paper Company, “the company-owned system of camps was discontinued on the American side in 1936” (Comeau 1950,p.10). However, Mando still operated camps in Canada in 1950. Perhaps the following description somewhat describes the last camps it operated on the Kabetogama Peninsula in Minnesota:

Today's logging camps are a far cry from the old days. For instance, at Mando camps the bunk houses are clean and well ventilated with plenty of windows. Single bunks, properly spaced, with flannelette sheets, pillow cases and wool blankets are provided. Oil heaters have replaced most of the old pot-bellied stoves. Central washrooms have hot and cold running water and even shower baths have been added. Camps are provided with electric lights and other electric conveniences such as refrigerators and large electric mixers. Radios and the like are common. The best of medical care is available, and should the logger be seriously injured in the woods, immediate contact is possible by radio. A doctor can be flown in by Mando airplane or the injured can be flown out for emergency treatment (Comeau 1950,p.10).

The Landscape of the Railroad Era

Although this 30 year period of logging has been referred to as the Golden Age, from an ecological and forestry perspective, the period can be characterized in bleaker terms. In describing the rail line the Virginia and Rainy Lake Company built to Hoist Bay, Beatty conveyed the beauty of the border country before it was logged:

The new railroad right of way was cut through nearly solid stands of tall white and Norway pine which made it an avenue of stately beauty. Above the crossing at Ash River, the palisades on its south bank reminded one of some of the far western logging streams because of the timbered canyon walls (Beatty Nov./Dec. 1963,p.59).

As the trees were cut, the landscape began to change dramatically. Some of the change was due to fires, often caused by sparks from trains and the state-mandated burning carried out by logging companies. O'Meara painted a picture of the region after logging and fire had taken their toll on the landscape:

For the most part, our route wound through vast stretches of slashings—the desolate debris of past logging operations—in which the second growth of birch and poplar had already taken hold. In some places fire had run through the cutover, charring the tangled mass of woods wreckage, and blackening the very boulders which the glaciers had strewn everywhere. There was little timber left in these parts, save for a patch now and then, following with geometric precision the town and section lines (O'Meara 1947,p.35).



Figure 10: *A typical logging landscape in northern Minnesota (Minnesota Historical Society).*

In 1919, in response to the disastrous fire at Cloquet, slash disposal requirements were modified. Instead of wholesale burning, slash had to be burned only when it was a fire hazard or near standing timber. Leslie Beatty, who helped enforce the state burning requirements as an employee of the State Forest Service, ascribed some changes in the landscape to the state laws regarding slash burning:

The slash disposal law, disguised as a protection measure against forest fires, but probably designed to ease the land clearing burdens of incoming settlers, was opposed by many loggers for economy reasons and by far-sighted conservationists for its destructive results. This law would continue to plague the state forest service for years to come (Beatty March/April 1963,p.64).

The burning requirement resulted in the loss of control of many fires and the loss of much young timber. There could hardly have been a more desolate sight than a cutover area that was subsequently burned over. In 1921 the Kabetogama Forest Protective Agreement was signed by several lumber companies that agreed to help patrol the border region (Beatty May/June 1965,p.61). In 1923, however, an extensive fire on the Kabetogama Peninsula raged out of control, despite concerted efforts to suppress it (Beatty Sept./Oct. 1965,p.59). This probably was the most devastating fire during the railroad phase of logging in the area encompassed by Voyageurs National Park.

Another change on the landscape of the border country came with construction of the first highway to cross northern St. Louis County. In 1920 “the voters on general election day in November, 1920, approved the passage of the highway amendment to the state constitution which would set in motion the long delayed highway construction program” (Beatty Sept./Oct. 1964,p.44). Now U. S. Highway 53, the road originally was part of State Highway 11, travelling from Cusson to the St. Louis-Koochiching County line.

End of the Railroad Era

The Railroad Age began to wane in the 1910s. The best of the lumber had been taken, and what was left was more remote, thus more expensive to procure. As Larson told the story of the Virginia and Rainy Lake Company’s last day of operation:

On October 9, 1929, C. H. Rogers, general superintendent of the company, set the levers that sent the last log of the Virginia mill into the flying bands of steel. The world’s largest white pine mill had closed its doors in the last of the white pine states reaching from Maine to Minnesota because it had no more logs. Residents of Virginia still remember the dramatic ending; as the last log was cut, a long blast from the plant whistle sounded a requiem for an industry that had been to a great extent the life of the community (Larson 1949,p.400).

The company had extracted all the white pine it could from the forests of the great border country. In the end, the investors did little more than recoup their initial investment. The cost of cutting in the remote area was simply too high to be very profitable (King 1981,p.127).

The empire that Backus had built fell on hard times in 1930, due to over-zealous expansion, especially in the pulp and paper industry, and the depression that had settled over the United States and much of the world. Backus’ problems seemed insurmountable:

The State of Minnesota sued him for taxes on his logging railroad. The International Joint Commission involved him in proceedings regarding the levels of the lakes influenced by his dams. The Federal Trade Commission investigated his contracts and sales. His Majesty the King filed suits to recover for Indian lands overflowed by the Backus waters. The State of Minnesota claimed damage from floods. . . . On March 1, 1931, the Backus companies faced the maturity of bonds and interest which they could not pay. That day the Backus financial empire fell. Bankruptcy was followed by years of receivership, litigation and reorganization (Rossman 1934,p.7).

Despite these problems, the International Lumber Company continued to cut timber until 1937. But, by 1934 Backus had taken all he could from the forests of the Kabetogama Peninsula by the old methods. The last big drive to get lumber to the Backus mill at International Falls took place in 1934, the year Backus died. According to Larson, who followed the drive in the company's boat, wannigan, and alligator, "people came from far and near to see the last big log-tow of 18,000,000 feet transported in six booms" (Larson 1949,p.401). This was the last log drive to take place in the area that became Voyageurs National Park, although not quite the last drive in northern Minnesota.

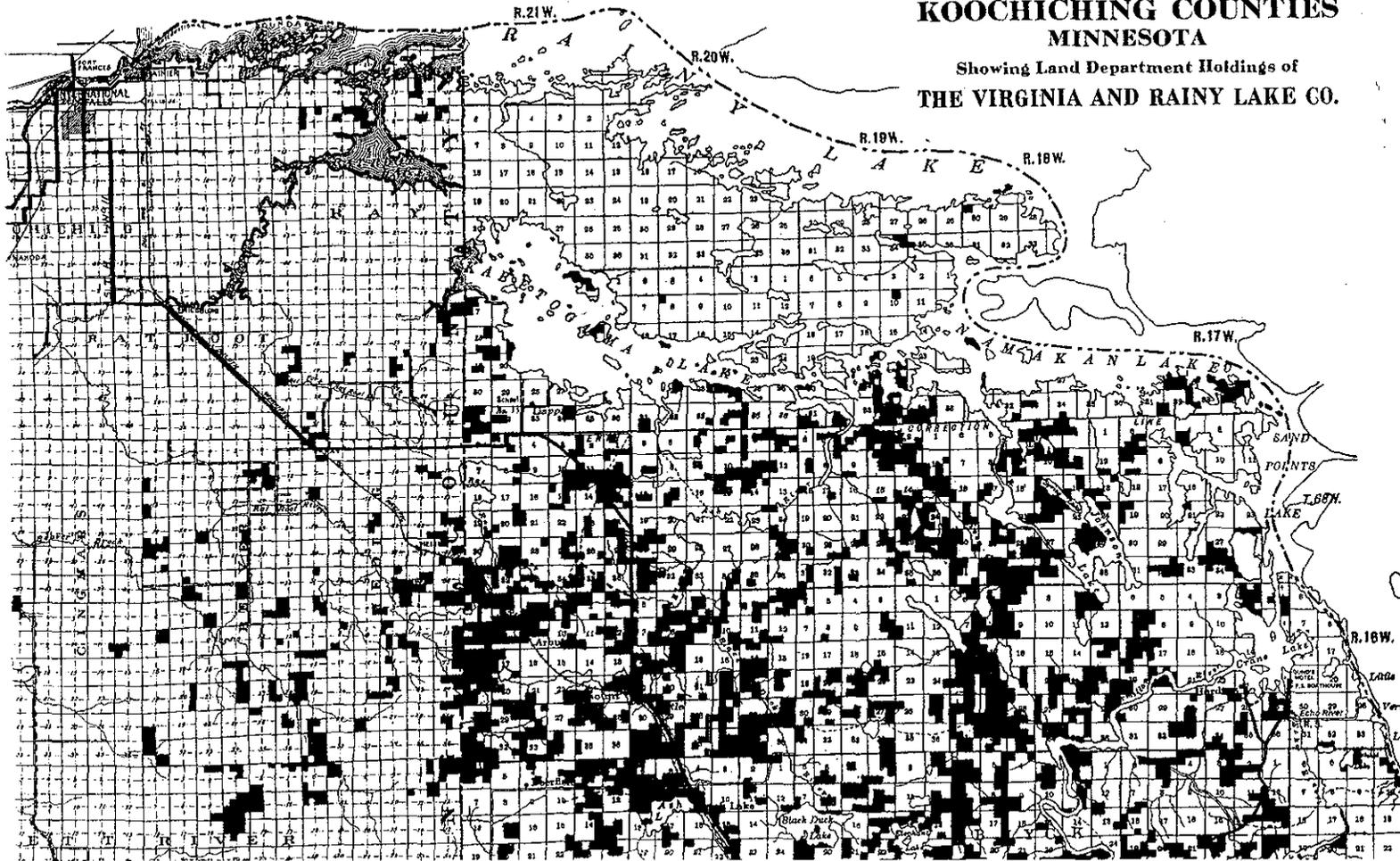
In 1937 the lumber mill at International Falls closed. As Frank King wrote, "In 1937, Minnesota's only remaining big sawmill, belonging to E. W. Backus' International Lumber Company at International Falls, cut its last log and wrote finis to a great industry" (King 1981,p.26). Main described the continuing downward spiral of the Backus empire:

The receivership was transmuted into a reorganization proceeding under the Federal Bankruptcy Act of 1936, and continued until March 1, 1941. . . Stockholders in the predecessor company received nothing as a result of the reorganization proceedings for the reason that the liabilities of the predecessor company exceeded the then value of the assets thereof. . . (Main 1950,p.4).

In 1941 Mando "acquired all of the assets of the following wholly owned United States subsidiaries, The Insulite Company (manufacturer of Insulite), International Lumber Company (timberlands, logging railroad and saw mill), and Minnesota Forest Products Company (timberlands). The operations formerly carried on by these subsidiaries are being continued by division of the Company (Mando)" (Main 1950,p.5).

MAP OF
ST. LOUIS AND
KOOCHICHING COUNTIES
MINNESOTA

Showing Land Department Holdings of
THE VIRGINIA AND RAINY LAKE CO.



SUB-CONTEXT 3

THE LOGGING ERA AT VOYAGEURS NATIONAL PARK

Figure 11: Land holdings of the Virginia and Rainy Lake Company in St. Louis and Koochiching counties. Published in 1928, this map was used to advertise Virginia and Rainy Lake Company lands for sale near the end of the company's existence (Minnesota Historical Society).

One of the most eloquent expressions about the end of the railroad era of logging in the border country was written by W. H. Maloney, who apparently worked at Virginia and Rainy Lake camp 137. A note attached to the copy of the poem at the Minnesota Historical Society Research Center reads, "This was handed in at the Virginia and Rainy Lake office when logging was finished in the North Woods. You may have this copy, if you wish. Would Minnesota Publications wish it in their records? Author not known (to me)."

I was forced to blow to this land of snow
To the short log country you see,
I was sick and broke and hungry, too,
It's just the place for me.

I packed my sack and hit the track
For the pine and Tamarack.
And take it from me it's the place to be
For this hungry Lumberjack.

I've stepped aside from the life outside
And let the world go by.
While I dig my teeth into real bull beef
And feast on soggy pie.

I've missed some meals, and got rough deals
So I've packed my canvas trunk
And gone on a spree, but I'm glad to be
In a good old double bunk.

For I love the call of the old crosshaul
And the team of dapple grays.
And the steady strain of the decking chain
As the logs roll up on the sleighs.

My fingers crook for the feel of a hook
I long for the top of a load,
I love the shout "Turn Out! Turn Out!"
Of a teamster down the road.

I love the whine of the saw in the pine,
As it bites its way to the heart.
And the steady crack of the swamper's axe
As he willingly does his part.

I thrill at the sight of the fire bright
As the blacksmith turns his crank.
And the anvil rings as his hammer swings
While he makes a brace for the tank.

And I go from there to the barn dog's Chair,
And Hark to the days that are o'er.
And the teamsters tell of the day of hell
On Rainy's rocky shore.

I hear the bawl of the push's call
As he orders us out to work
And our loads we'll land, for we understand,
Our check is there, if we shirk.

And the scaler's talk as he swings his chalk
For a number over there,
But we know by his glance that there isn't a chance
Of landing five million this year.

We eat and freeze in the lee of the trees
As the North wind sends its chill
And our chuck is froze while we hold our nose,
At the lunch ground on the hill.

Then home at night when the moon is bright
And the Coyotes raise their yell,
To a double bed in a paper shed,
And a drink from a surface well.

But the best of all is the supper call
When we troop into the shack,
And eat a bite with the appetite
Of a hungry Lumberjack.

We work long days and sleep short nights
And play at cards for fun.
But the forest recedes as we do our deeds,
We'll be paid off, one by one.

Farewell to rows of underclothes,
And socks hung up to dry,
Farewell to the seats which were such great treats
When the bacon swung so high.

No more can we peep as we fain would sleep
From blankets narrow and damp
Or to hear the morn of the breakfast horn,
As the bull cook lights the lamps.

The clerk in his cage of wire gage,
Has cut his price to the rocks,
And a shirt may be had if you want it bad,
For the price of a pair of socks.

Next week we'll go from this land of snow
To town, and then our fun,
And we'll count our stakes as we cross the lake,
For the V.R.L. is done.

W. H. Maloney
Camp 137

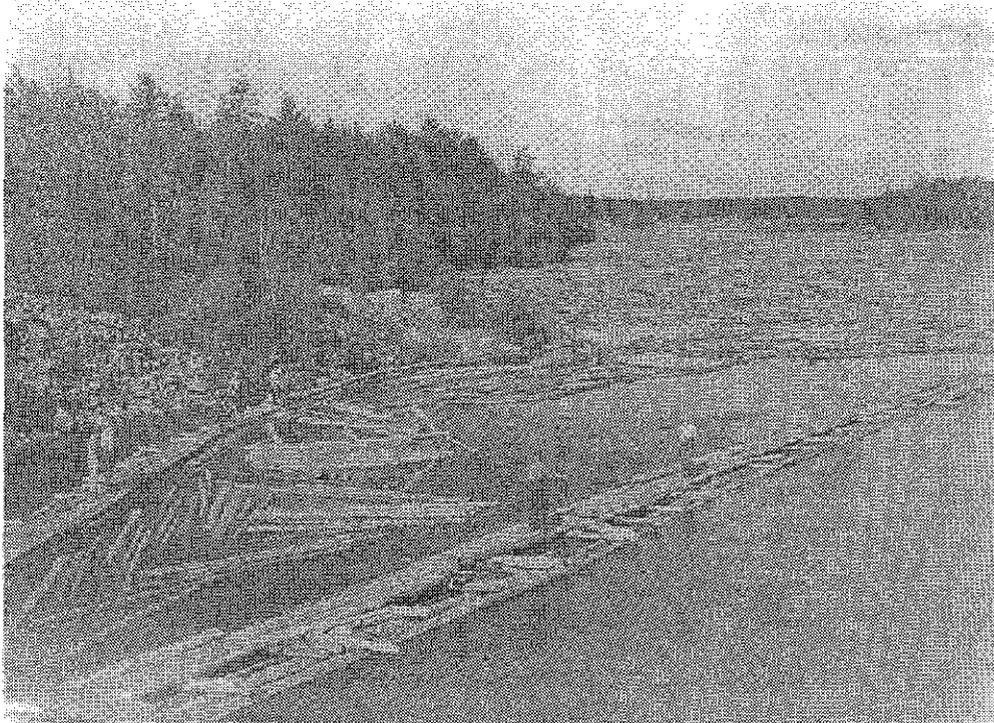


Figure 12: *One of the last drives of logs through Kettle Falls, 1930. The logs were driven down Rainy Lake to the mill at Fort Frances (Minnesota Historical Society).*

**5. SUB-CONTEXT 3:
LATE LOGGING AT VOYAGEURS NATIONAL PARK,
1938 - 1970**

*Then one morning the romance of logging was gone.
Gone were the feats of skill and prowess on the drive, for
gone was the drive. The age of steel was upon
lumbering—the impersonal age, the non-singing age.*

Franz Rickaby, 1926⁵

Although Rickaby wrote these words more than ten years before the end of the drive in the border country, he accurately described the passing of the romantic era of logging in that region in the mid-1930s. Although its tall tales live on to this day, so do the logging processes that began to emerge as the age passed.

The final phase of logging dawned in the border country after the best timber had been removed and the biggest logging companies had ceased to exist. Outliving the Virginia and Rainy Lake Company by several years, the International Lumber Company finally was dissolved in 1937. With its demise, the Backus-built empire discontinued its sawmill operation, and its logging operation was completely overhauled. The Minnesota and Ontario Paper Company (Mando), which emerged from receivership as the Backus heir, began logging with new techniques and a new intent.

In 1937 the company began removing its logging railroads, a process that took about 10 years (Comeau 1950,p.29). Mando had begun to haul with trucks in the early 1930s, but King wrote that by 1941 Mando was moving all of its lumber by truck. He noted that it “briefly returned to logging with railroads during WWII, reverting to truck hauling after the war. The end of rail operations came during the summer of 1947 with removal of 32 miles of steel between Craigville and Little Fork” (King 1981,p.132).

By the mid-1940s, Mando owned 52,000 acres of the 79,000 acres that comprised the Kabetogama Peninsula, having obtained the land after the U. S. Forest Service proposal to extend its ownership into the peninsula was rejected by Governor Harold Stassen. The

⁵ Franz Rickaby, *Songs and Ballads of the Shanty-Boy* (Cambridge: Harvard University Press, 1926), pp.xx-xxi.

company offered to “exchange this land with the State of Minnesota for timber growing lands which were closer to the mill and had an abundance of spruce. Spruce pulp-wood was in short supply, and the company’s interest in exchanging this land was to improve its supply of spruce timber” (Amidon 7-12-76,p.2). The offer resulted in so much public controversy that the lumber company withdrew it. According to Arnold Johnson, the company “resigned itself to managing the land” and made other plans for the peninsula (Johnson 12-31-97):

(Mando) decided to establish a sustained yield forestry program for the area, and in 1949 the first camp was established. It was south of Rabbit Island (Rainy Lake) toward the east end of the peninsula not too far from Kettle Falls. Alfred Johnson established a regular old-time logging camp and started harvesting timber in the area. I’m not sure how long he was in that particular spot, but we did log the Kabetogama area continuously until the park was formally established which, I believe, was January of 1970 (Amidon 7-12-76,p.3).

Arnold Johnson, a forester who was the Koochiching County Land Commissioner from 1952 to 1969, wrote that actually the International Lumber Company initiated a program of forest management as early as 1932 when it hired forester E. W. Hartwell (Johnson 12-31-97). Although the recommendations of Hartwell and others probably were instrumental in establishing an enlightened forestry policy, because of the receivership situation and the constraints imposed by the national depression, the program was not activated at this time. In 1936 Mando hired F. E. Boeckh, a forestry graduate of Iowa State College, who “began a modest forestry program with the help of the Forest Service and the Minnesota Division of Forestry. A forest management plan was developed, tree planting was carried on, and partial cutting operations were started” (Clepper 1971,p.265). Johnson explained Mando’s reforestation efforts:

By 1936 the first tree planting on company lands was done and some thinning and selective cutting of red pine was done on an experimental basis. This was in Koochiching and Itasca counties, not in the park area. More foresters were added in the late 1930’s and early 1940’s with some forestry projects undertaken. . . In 1944 George B. Amidon was hired to head and start a comprehensive forest management program. He hired a number of competent foresters and embarked on a program which endured and expanded to this day now under Boise Cascade (Johnson 12-31-97).

George Amidon, who began Mando's comprehensive forest management program in 1944, instituted an after-harvest plan for the peninsula that included the long-term, sustained-yield of the aspen, balsam, white spruce, and pine that thrived there. Sustained yield management is:

. . . the operation of a forest for continuous production in order to maintain a balance between net growth and drain. By drain is meant the annual or periodic losses resulting from wood harvesting, fire, insects, and disease. Sustained-yield management is a form of multiple-use forestry, the practice which combines two or more objectives, such as timber production and water, or forage production for livestock, or browse for deer, or soil erosion prevention, or recreation (Clepper 1971,p.114).

Timber production, of course, was the primary goal of Mando, but the company combined it with the objective of providing recreational opportunities for the public. Johnson wrote that "the company lands on the peninsula were under a continuous forest inventory system (CFI) as were the rest of the company lands. This system provided for periodic measurements of sample plots to monitor growth, mortality, and changes that occur in the forest" (Johnson 12-31-97). Clepper explained that CFI "is a system based on the periodic measurement of permanent forest plots and the calculation of growth by the use of computers" (Clepper 1971,p.266).

Johnson mentioned that "the (Kabetogama) peninsula was sprayed in the 1950s to control an infestation of the spruce budworm which was particularly hard on balsam. The spray job was successful and saved much balsam timber" (Johnson 12-31-97).

The company logged balsam fir, jack pine, and aspen. Early in this phase, spruce and jack pine were skidded to ice landings and towed to the mills the following summer. Aspen, because it does not float well while green, was landed on the banks next to the lake "and then allowed to dry out and then perhaps in about August, the summer following the winter logging, the logs were pushed into the lake, and then towed to the mills at International Falls, Minnesota" (Amidon 7-12-76,p.3).

This very last vestige of old-time logging came to an end when the logging contractors and paper company built winter logging roads into the peninsula. According to Amidon:

. . . the logging road came in from off of Highway 53 and went in just south of Black Bay and then east, I presume about 15 or 20 miles. It didn't quite get to Kettle Falls, but I think it was within five or six miles of Kettle Falls (Amidon 7-12-76,p.4).

According to Trygg, "The logging in later years was pretty much scattered by small jobbers like Henry Keyes. He did some logging on the peninsula, a lot of pulpwood, and that was hauled by truck over the ice, either by way of Gappas Landing or over to Black Bay on the Gold Portage side" (Trygg 8-29-75,p.14). Arnold Johnson wrote that there were four logging contractors on the peninsula in the 1950s and 1960s. He stated that "the company put in an extensive logging road system and organized the operation along the lines of a long term sustained yield forest management plan" (Johnson 12-31-97). Amidon noted that, "The average cut for the 22 years we logged there was about seven thousand cords per year or a total of about 150,000 cords of wood" (Amidon 7-12-76,p.4).

The Logging Process

Fred Hilden called the third phase of Minnesota's logging history, the "mechanized age" because of its reliance on trucks and other equipment. With phase 3, gone were the railroads and gone were the horses. By the mid-1930s power saws were being taken to the woods, although Alfred Johnson claimed that they were "underpowered and tempermental" (*Rainy Lake Chronicle* 3-17-74,p.8). Victor Manilla stated that power saws "came into the picture" right after World War II (Manilla 1976,p.75-76). He echoed Johnson's complaints about the early power saws:

We bought (a power saw) and paid \$600 for the first saw. We took it in the woods, and never cut a tree with it. It never worked, brand new saw. . . We bought another one, what they call a Titon. . . Pretty soon we bought two, and we had two or three or four. Then came the Homelite. It was a little better than the Titon, and we went into Homelites. . . We furnished pretty near every man with one of these Homelite power saws (Manilla 1976,p.76-77).

Manilla said that after 1950 power saws:

. . . really took the place. They're still used in the woods quite largely except for this feller buncher. It shears it off, lifts it off the stump, tree and all, and it reaches out and puts it into a bunch, maybe six or seven. Then comes a grapple skidder. . .

It had big grapples on it that would take the whole thing, this feller buncher brings it in, limbs and all. Then another thing they've got these limbers. When they bring this in like that, they'll come along close to the landing and then they'll have another small tractor with a limber on it. They'll go up to the top and they'll come up with chains (chain drum turning). These are delimiters and they back right up to this machine and go back out and all the limbs are all gone, pulverized, no limbs (Manilla 1976,p.78).

Hauling and loading were done by diesel-powered equipment, instead of steam-powered. During the 1940s, much of the steam equipment was relegated to scrap iron (Manilla 1976,p.59). Logs were moved with caterpillars and tractors. Trucks hauled timber out from the forests. Said Johnson:

Then the trucks came, and the wood started getting farther and farther away from town, and the trailers came, and eventually now they haul pretty near carloads at a time compared to where we were lucky if we hauled a cord and a half (Johnson 4-11-77,p.14)

Drache demonstrated the increasing use of trucks through the 1920s in his second volume of Koochiching County history. He concluded that by the late 1920s "a man with a truck could do four times as much per day as a man with a team" (Drache 1992,p.332). By 1933, he noted, the first semi-trailer rigs were used. Although the use of trucks for logging continued to grow, Drache noted that:

The natural sluggishness of the corporate structure prevented M & O from adopting innovations as rapidly as the contractors, but by the 1931-32 season, it used trucks to pull sleighs from the woods to the main rail line (Drache 1992,p.333).

Ryan expressed the time savings in truck hauling:

Trucks that haul as much as a railroad car now come out of narrow forest truck trails and wheel down the highways, taking pulpwood, logs, and other forest products from the woods to their destinations in less time than it once took to skid them to the railroads (Ryan 1946,p.308).

R-25

R-24

R-23

R-22

R-21

R-20

R-19

R-18

MINNESOTA AND ONTARIO PAPER CO. OPERATING AREA

SCALE OF MILES
0 1 2 3 4 5
BASE MAP DRAWN BY LYLE WOOD 2-11-1957

- LEGEND**
- PRIMARY ROADS
 - PAVED
 - GRAVEL
 - SECONDARY ROADS
 - ALL WEATHER
 - DRY WEATHER
 - WINTER

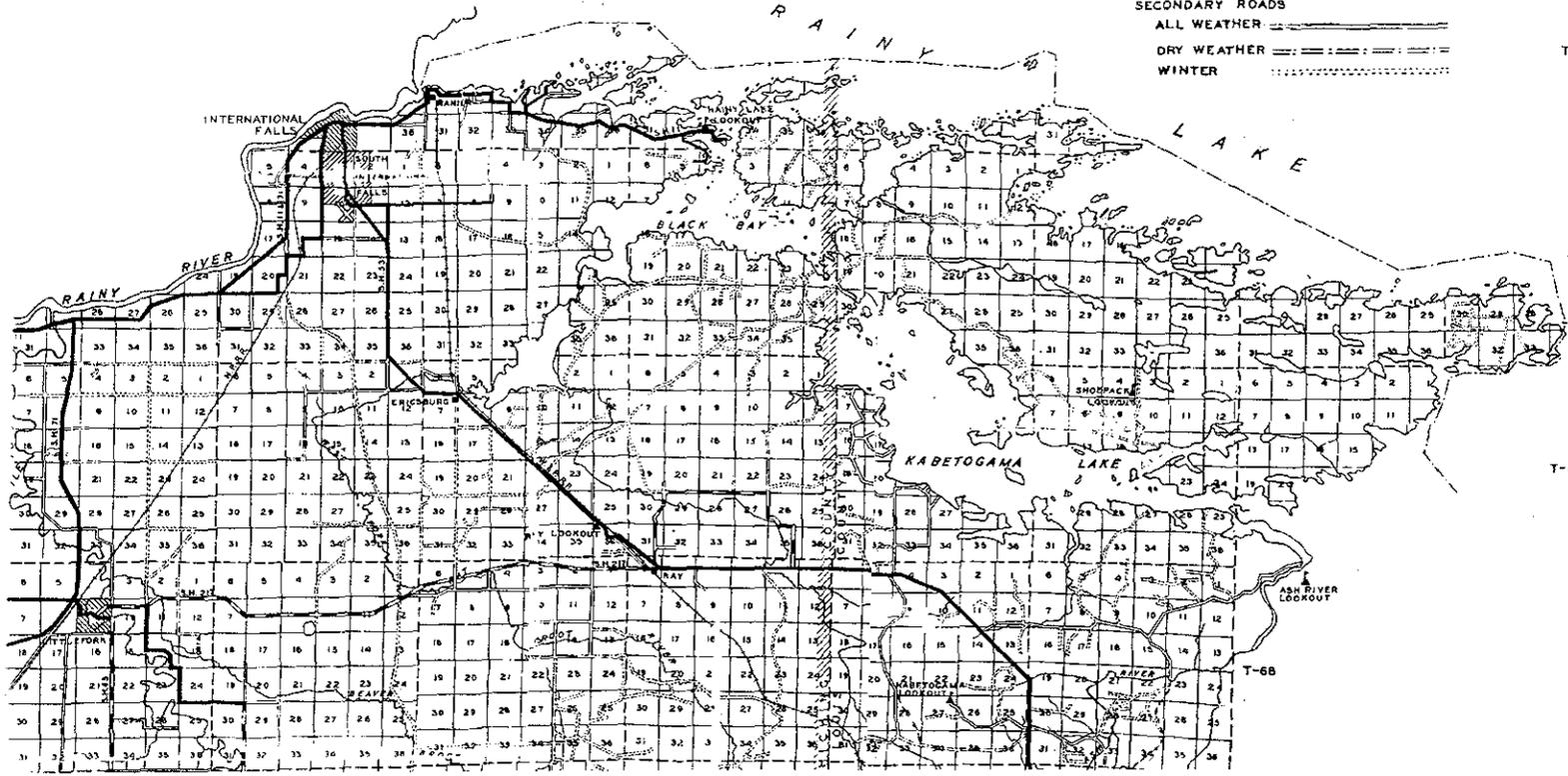
T-71

T-70

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T-68

SUB-CONTEXT 3



THE LOGGING ERA AT VOYAGEURS NATIONAL PARK

Figure 13: Mando operating area. The 1958 map shows roads built by the Minnesota and Ontario Paper Company in the vicinity of Voyageurs National Park (Koochiching County Historical Society).

For pulpwood logging, the process became increasingly mechanized. "Direct woods-to-mill delivery without a reload became possible" (King 1981,p.132). According to Johnson:

Before it was a 32 inch piece at a time. You took an 8 foot pulpwood stick and first it went through the slashers in the mill, and then it went into the big drums, barking drums, in 32 inch pieces. Now they go to a barker, and the whole tree goes right through the chipper. They don't bother to cut it up anymore. Now they can bark it and chip it at once. They can blow it right into the truck. There's no heavy handling, no machinery outside a blower to blow it in the truck where before you used to have a crane or something to load it, and then the same way with unloading it. Now they just back it up on the ramp and dump it (Johnson 4-11-77,p.15).

The labor force began to change too during this last phase of logging in Voyageurs National Park. Johnson said the newcomers just could not produce like the old-timers. "We weren't able to attract young men to the woods," he said. "It was hard seasonal work, and I knew that mechanization had to come" (*Rainy Lake Chronicle* 3-17-74,p.9). Hiram M. Drache provided an excellent analysis of "The Changing Wilderness" in the chapter by that name in the second volume of his history of Koochiching County, *Taming the Wilderness* (Danville, IL: Interstate Publishers, 1992).

Late Logging Camps

The camps changed, and then disappeared in the third phase of logging. Near the end of the railroad era, the International Lumber Company was beginning to make the transition from operating camps to obtain lumber, to contracting for lumber. "By 1933 the receivership still used eight camps but also had five independent contractors" (Drache 1992,p.329). Drache wrote that Mando (replacing International) stopped operating camps at all by 1937. In that year the company began using contractors exclusively, relying on 25 that had served it well (Drache 1992,p.329). Arnold Johnson noted that the company also obtained wood on the open market, buying from independent loggers, farmers, etc. (Johnson 12-31-97,p.3).

Arnold Johnson explained that Mando negotiated agreements for the harvest and delivery of wood, specifying (and enforcing) cutting regulations. The contract may have included a provision allowing the contractor to use the company's equipment, such as

road building equipment and camp buildings. Stumpage may or may not have been provided by Mando, and the contractor was obligated to deliver the agreed upon stumpage for a certain price per measure (Johnson 12-31-97,p.2).

The contractors operated camps, typically smaller than the big camps of the previous phase, and often family-run enterprises. Many of their workers lived in the communities near the logging operations, but deep into the Kabetogama Peninsula commuting was impossible. The camps were much improved over earlier camps. Electricity and refrigeration eased the job of the cook. Oil was cheaper to obtain than wood, so it replaced wood for heating (Johnson 4-11-77,p.14). Drache explained the ramifications of the switch to contractor operated camps by Mando:

. . . the bottom line said it best—the company cost of producing a cord of pulpwood was \$10.081 in contrast to \$9.295 for the contractor cost. The contractor cost varied from \$7.740 to \$12.009 per cord, because some worked where no M&O camp could have considered operating. Clearly, a new and much improved way of harvesting the wilderness and a far better life for the woods worker was established (Drache 1992,p.332).

By 1964 the last of the contract-operated camps on the Kabetogama Peninsula closed. Alfred Johnson ran the camp at Kettle Falls until its end. About three years before the camp's closing, Mando had stopped serving meals to lumberjacks and, according to Johnson, "Without the cook camps it will never be the same. I believed in the camps because it gave you better control of the men and you got better production" (*Rainy Lake Chronicle*, 3-17-74,p.9).

The Late Logging Landscape

The focus on pulpwood logging, the development of highly efficient equipment, and the introduction of forestry practices resulted in a different logging landscape in the late period of logging in the Voyageurs National Park region. Mando had implemented a sustained-yield management strategy, which, by definition, provides "for the cutting of no more timber than the lands were reproducing to assure a constant source of supply" (Clepper 1971,p.111). The purpose of the sustained-yield approach to management, according to Clepper, was "to obtain the maximum financial return from the timber

harvests and at the same time to apply sound silvicultural practices that will maintain the lands in permanent production” (Clepper 1971,p.106).

The success of Mando’s (and later Boise-Cascades’) management practices could be seen in the transformation of the landscape. Tree planting, combined with partial cutting practices, resulted in a constant renewal of forest resources.

Victor Manilla described logging practices of the mid-1970s in different terms. He stated that by the 1970s it had become economically practical to harvest scattered stands of timber that would have been ignored in earlier periods. Apparently these scattered stands were harvested without partial cutting. With the new equipment, it became more efficient to clear an area entirely,

. . . whether it’s spruce, thin, or scattered, or way far away, or if it’s thick or what. It doesn’t make any difference. It’s just 40 acres over here or 20 to 100 acres or 2 or 80 over here or what. You take it all. With this equipment they just move on, take everything that’s timber there. They just clean her out (Manilla 1976,p.81).

The patchwork of logged areas, however, is not left bare. Again, Victor Manilla explained:

It’s another form of farming. . . Motto: Cut one tree, plant one tree. That is the word. . . If you do this, I don’t see how in the world they could run out of timber, because it can grow faster than you can take it out, or at least stay abreast with your timber very much. It’s actually a renewable resource that won’t run out (Manilla 1976,p.83).

Thus, creating a new “cutover” is unlikely, even though logging continues, because the forests constantly are renewed. As Clepper wrote, “The former Mando woodlands provide excellent examples of an intensity of silviculture that was literally unknown three decades ago” (Clepper 1971,p.266).

The End of Logging in Voyageurs National Park

After World War II, Mando was interested exclusively in pulpwood logging, and the Kabetogama Peninsula was one source of timber. In 1949, after Mando withdrew its offer to exchange the peninsula for other state lands, a sustained yield forestry program was established there (Amidon 7-12-76,p.3). In the mid-1950s, the logging road shown in Figure 13 was built into the peninsula to facilitate cutting operations.

As a trained forester and Chief of Forest Management for Mando beginning in 1944, Amidon was in a position to introduce positive changes in forest practices on the peninsula. In addition to developing the sustained use forestry program, Amidon opened the peninsula to public recreational use. About thirty campsites and picnic areas had been built for public use by 1965.

In the early 1960s, federal, state, and public interest in establishing a national park in the border country began to coalesce. Amidon recalled a fateful tour that must have helped convince high-level state and federal officials that northern Minnesota is truly a national treasure:

I can well remember the first trip we took. It was in June, 1962, to examine the Kabetogama area as a possible park site. On that trip were Elmer Anderson (governor of Minnesota), Judge Hella, the Director of the Minnesota Historical Society, Mr. Russell Fridley, Conrad Wirth who was then the Director of the National Park Service in Washington, Sigurd Olson and myself. We left from the Lake Kabetogama side, went to Kettle Falls, and then came back by way of Rainy Lake, and ended up at Island View Lodge on Rainy Lake. It was a beautiful day. The sun was most cooperative and no wind. I often told afterwards at some of the hearings that if the day had been one of Rainy Lake's not unusual rainy, windy days, maybe the park would never have been established (Amidon 7-12-76,p.5).

In 1965 Mando was bought out by the Boise Cascade Corporation, which continued logging operations on the peninsula. In that same year, Mando/Boise Cascade informed the state and federal governments that it did not support a national park in the Kabetogama Peninsula, possibly because it was considering developing the shoreline for recreational use. Its protests could not overwhelm the interests that prevailed, and with state, federal, and public support, legislation creating the park was signed in January 1970 (Amidon 7-12-76,p.8). A year later, in January 1971, the park became a reality. In June of that year, according to Amidon:

. . . we issued a press release saying that we were winding down our logging operations; I think about 3,000 cords were cut that last year, and we would not cut any more timber in the area, but would continue to maintain our camp and picnic facilities (Amidon 7-12-76,p.10).

Thus ended the third phase of logging in the border region east of International Falls. Had Mando and Boise Cascade not implemented sustained yield practices, the concept of a park may not have held such appeal. In the end, wise logging practices helped reclaim the forests that had so recently been decimated by those with less knowledge and foresight.

6. PROPERTY TYPE 1: CAMPS AND RELATED STRUCTURES

As a community, a lumber camp is a sad travesty at best.

Rexford G. Tugwell⁶

During the logging era in Voyageurs National Park, housing facilities were an important component of the landscape. In the early phase of logging, a cabin and barn or a small number of buildings might have constituted a camp. In the next two phases, camps ranged in size, but included large complexes of buildings that may have housed 200 men. Because of the huge amount of logging activity during the railroad era, there were far more camps built during this era. The habitation property types of the three phases of logging in Voyageurs National Park are described in this section.

Early Logging: Shanties and Small Camps

Larson provided one of the few descriptions of logging shanties in Minnesota in her 1932 article *On the Trail of the Woodsman*. She described a typical shanty in the following bleak terms:

A shanty, low and dark, served as the woodsman's living quarters. It was built of logs; its sides were never more than four feet high, and the roof was steep and sometimes ran almost to the ground. . . The gables were built of logs, for windows were very rare. The shanty varied in size, depending upon the number in the crew. One on the banks of the Snake River in 1841 was twenty-five by forty feet. Moss and clay filled the openings between the logs to keep the warmth in. The shanty had but one big room, where at least twenty men lived during the coldest days of the year (Larson 1932,p.352).

Larson noted that inside the shanty was a central "big open fire, which baked the bread, dried the clothes, gave cheer and warmth, and illuminated many a squaw dance." The men slept at one end of the room on beds of "balsam boughs a foot deep" with a grindstone, wash sink and barrel of water nearby (Larson 1932,p.352-53). The kitchen was at the other end of the shanty, although the cook usually cooked over the open fire or in a nearby reflector oven or bean hole.

⁶ John E. Haynes, "Revolt of the 'Timber Beasts,'" *Minnesota History* (St. Paul: Minnesota Historical Society, Spring 1971), p.168.

Robert Mitchell came to Minnesota in 1898 from Canada to begin logging. He described an "isolated camp," which seems to be similar to Larson's shanty, as follows:

Each camp was dependent upon a central fireplace for both cooking and heating. The fireplace was built by placing four large logs in the center of the building in the form of a square. At the four corners were four uprights that supported a chamboise which would carry smoke and fumes out of the building.

Between the logs that formed the square, clay and sand were placed and upon that a fire was built. On the uprights cranes were attached to hold the immense kettles that were needed for water and cooking and on the uprights were hung other needed articles for the cook's use.

Bunks were built along the four walls, one above the other, each for two men, with feet toward the fire. In front of these bunks was a long bench, known as the "deacons' seat." This served two purposes, one as a stepladder, the other was a provision for seating the men when they were in the house for meals or rest.

Tables were placed between the seats and the fire with the cook standing back of them. . . Later big stoves were used for the cooking and bunk houses were separate (*Minnesota Logging*, p.1).

The one room cabin or shanty undoubtedly was present in Voyageurs National Park. From superficial observation and above ground evidence, they easily could be confused with homesteads. In 1962 Beatty described what today's archeologist may still see: "log building foundations can be identified by ridges or banked dirt where the sill logs originally laid" (Beatty September/October 1962, p.22). The foundation remnants would be associated with a cabin and barn for oxen or horses. Remains of a fire pit may note the shanty location. A root cellar might be apparent by mounded soil or a depression, and an outhouse might be revealed by a depression. The area would be generally disturbed and, although actual clearings are harder to find with the passage of time, the vegetation certainly would not be old growth.

Artifacts that occurred with some frequency, such as pipes and other items commonly associated with men, would indicate the strong possibility of a shanty camp. Likewise, artifacts more strongly associated with women may (but may not!) indicate that a homestead, not a logging shanty existed on the site. An artifact profile for this type of camp in far northern Minnesota has not been developed; however, Beatty stated that "the old camp dump sites will likely reveal discarded horse or ox shoes, junked cast iron or

steel cooking ware, wrinkled or leather shoepacs, and possibly a few glazed earthenware snuff jars. The presence of tin cans or fancy whiskey bottles on a dump site rules it out as an old timer” (Beatty September/October 1962,p. 22).

Trygg stated that the first logging camp was established in the Voyageurs National Park region by the Beatty Brothers in 1886. It was located on Government Lot 3, Section 27 on Namakan Lake (Trygg 8-29-75,p.24). Tom and George Beatty (uncles of Les Beatty) came with horses and a crew “over from Tower . . . and over the ice of Lake Vermilion and followed up the portage to Buyck and cross country through Johnson Lake and came up through Junction Bay in the dead of winter” to establish their camp. Trygg noted that they built the camp and cut logs at the same time, then they floated the logs through Kettle Falls (no dam yet), down Rainy Lake to Rainy River, and on to Rat Portage (later Kenora). The camp had been burned when the brothers returned a year later (Trygg 8-29-75,p.25).

Shanties would have been located near the waterways that were used in the early phase of logging. Recall that Rainy River, Rat Portage, and Fort Frances were destinations for the logs that were cut in this early logging period. Because they were floated across Rainy Lake, the logical location of early camps would be in the vicinity of Rainy Lake or its tributaries. The Beatty brothers’ camp on Namakan Lake suggests that camps were built in the Kettle Falls region. Recall also that in this low technology period logs were skidded short distances. Therefore, these small camps would have been in close proximity to the waterways.

Shanties and small camps cannot always be associated with the early logging period, because this scale of operation persisted even into the third, modern, phase of logging. However, when they are found in the above locations, there is a possibility they are early cultural remains. Associated artifacts will identify a time-frame for the site.

Railroad Era Logging: Virginia and Rainy Lake Company and International Lumber Company Camps

Walter O’Meara provided detailed information about logging camps to the Minnesota Historical Society when it was planning the Forest History Center in Grand Rapids. Because he provided building dimensions and specifications, historic photographs of logging camps can be examined with a better idea of the scale they represent. When he

conveyed his notes to the Minnesota Historical Society, O'Meara offered the following explanation:

These notes cover the personnel, equipment, and operation of a typical Northern Minnesota logging camp around the year 1906. They are based on my own experience in a Northern Lumber company camp near Brimson, Minn. in 1917 (when conditions were about the same) and on information obtained from my father, Michael O'Meara, who spent winters in the woods as a scaler. They are notes for a work of fiction, but are, I believe, authentic in every detail (O'Meara 2-3-75, attachment).

Brimson is about 35 miles southeast of Virginia, in St. Louis County. It would have been logged before the border country, but it is close enough to share characteristics of the far north.

Big logging companies maintained three types of camps: construction camps, logging (or sleigh haul) camps, and railroad or hoist camps. Although similar in many respects, the types varied somewhat in their siting, layout, and size. At Voyageurs National Park, Virginia and Rainy Lake Company camps exhibit the most variation. International Lumber Company camps were predominantly logging camps.

Railroad camps were on the mainline of the railroad, or on a permanent spur. Because of their access to good transportation, these camps operated a longer season than other camp types (Eicholz n.d.,p.13). Camp 75 at Hoist Bay was the only hoist (railroad) camp in the area encompassed by Voyageurs National Park. It was remarkable for the complexity of its rail operation and the mechanism for hoisting logs from the water to flatcars. The hoist camp had to be located on a railroad line, at a point where the hoist machinery could be made operable (near or on the water), and in good access to timber being logged. The site at Namakan Lake met all the criteria.

Sleigh haul camps often were buried deep in the areas that were not easily accessible. They often were isolated by virtue of swampy terrain or some other factors, thus only could be reached over frozen ground. Because felled trees were sleighed from the woods to a rail line or water, sleigh haul camps were located in proximity to one or the other. Most of the camps of this period in Voyageurs National Park were sleigh haul camps.

According to Fritz, one construction camp site is located within the boundaries of Voyageurs National Park, camp #113 on the Kabetogama Peninsula. This camp did not

include a logging operation; instead, the workers carried out construction projects needed by logging camps in the vicinity.

Siting and Layout of Camps. Logging camps operated by the Virginia and Rainy Lake Company and, probably, the International Lumber Company had distinct layouts.

Although a company plan was not located, Krenz stated the following:

A uniform building plan was used in construction and later camps were literally taken apart, moved, and reassembled in new locations. . . Each camp usually consisted of eight buildings and was constructed to accommodate 160 men and 40 horses (Krenz 1969,p.65).

The buildings probably were reassembled in a similar plan from camp to camp, with adaptations made to accommodate their function, terrain, and proximity to water.

Efficient and comfortable plans were worked out over the years, and the familiarity of buildings and plans afforded a hominess that was otherwise lacking. O'Meara provided a description of the plan of the mythical Camp Dempsey:

For Camp Dempsey was a tight, snug set of camps, you had to admit, and properly laid out. On three sides—the south, east, and west—it was well protected against the weather by a stand of Norway pine; on the north it was sheltered by a high, thinly-wooded ridge. As you came onto it at the top of the hill, where the road crossed over the ridge, and saw it down there in the pine woods, it looked for all the world like one of those models you sometimes see in museums—very neat and orderly, with the camp rubbish covered by the smooth, clean snow, and the smoke from the fires going straight up on still days.

The buildings, which were six in number, were set low in the snow; and they huddled close together, as if for companionship in the lonely forest. All were disposed in trim rows along the two sides of a sort of “company street.”

The main camps, so as to be handy to water, occupied the north side of the street, opening their back doors to Wolf Creek. They were: the bunkhouse, where the men lived and slept; the cook-shanty, where they ate; and somewhat removed, the horse barns which sheltered Camp Dempsey's draft animals. Opposite these buildings were three smaller ones: the office, the filer's shack, and the blacksmith's shop. A roothouse had been sunk into the hillside just west of the office, and a sheltered latrine had been dug a sanitary hundred feet or so beyond the smith's.

And that, excepting the pig pen and a storage shed or two, was all of Dempsey's camp—all that you could see, at any rate, as you came upon it on the tote-road over the ridge. . . Yet Dempsey's camp was the home of almost a hundred men during the long, snowy winter of 1906 . . . (O'Meara 1947,p.73-75).

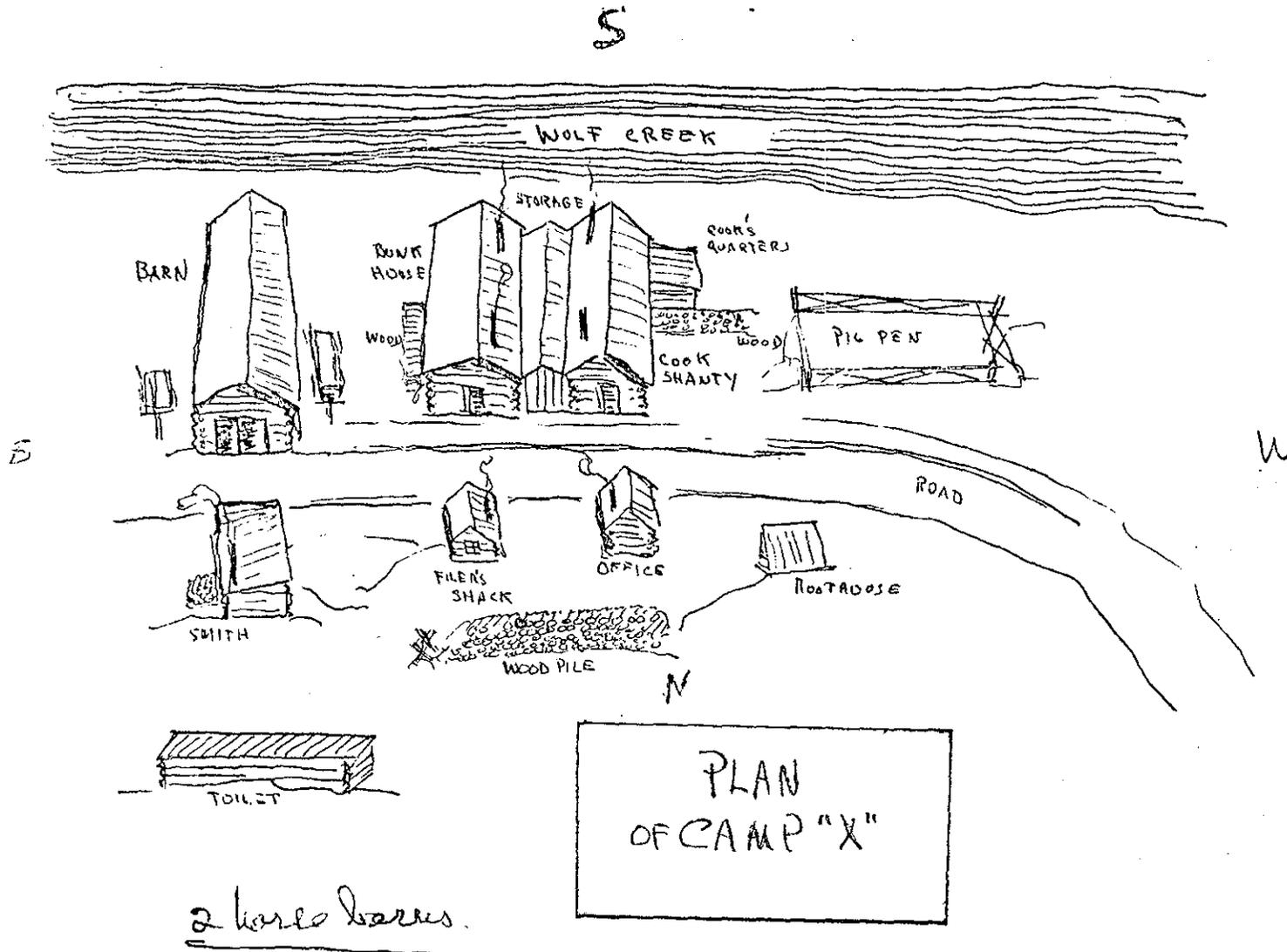


Figure 14: Plan of Camp X. Walter O'Meara sketched a theoretical camp to assist the Minnesota Historical Society in its development of the Forest History Center. The log construction indicates a camp built before about 1915. Note the proximity of the camp to the creek (*Minnesota Historical Society*).



Figure 15: *Virginia and Rainy Lake Company, camp 90, 1921* (Minnesota Historical Society, donated by Oswald Johnson).

The Location of Virginia and Rainy Lake Company Camps. The general locations of the VRL camps were determined by Fritz from the lists of camps the company maintained. The company lists identified camps by assigned numbers and location (town, range, and section). They are not always easy to locate in the field (Fritz 1986,p.84-85). There may be few surface remains of VRL camps, but less dense vegetation and disturbed ground are good clues to their locations. Beatty's description of the extreme measures that were taken to destroy the camps after the company went out of business follows:

During the winter of 1928-29, when the Virginia and Rainy Lake logging operations were in their final stages, I approached Logging Superintendent F. H. Gillmor at Cusson about the advisability of destroying all logging camp buildings upon their abandonment. The purpose behind my request was to eliminate all vacated structures before undesirable transients moved in. As there were no materials in the buildings worthy of salvage, we agreed that the structures should be destroyed, either by burning during fire-safe weather conditions or by levelling with dynamite charges. The demolition jobs were well executed, except in some cases where large, timber-lined, earth-covered root houses were overlooked by the wrecking crews. It was not long before the intact root houses were discovered and occupied by bootleggers, still operators, outlaw game market hunters and trappers, but these were eventually dislodged while absent from their dugouts when the forest patrolmen and game wardens blew up the structures with dynamite (Beatty March/April 1966,p.63).

The Location of International Lumber Company Camps. The International Lumber Company's presence in the park was concentrated on the Kabetogama Peninsula. The International camp locations shown in Figure 18 were mentioned in verbal accounts. Rumor has it that a map showing International Lumber Company camps exists, but this author could not locate it. The Minnesota Historical Society and several archives in northern Minnesota were queried about this map, but it could not be located. When it surfaces, this information should be added to the body of data about the logging history of Voyageurs National Park.

Camp Buildings. The early camp buildings were constructed of logs felled in the proximity of the camp. According to O'Meara, it took about two weeks to build an early camp. Parts of buildings, such as windows and doors, may have been recycled from a camp that had been discontinued. The following descriptions of buildings found in railroad era logging camps are compiled from O'Meara and other sources.

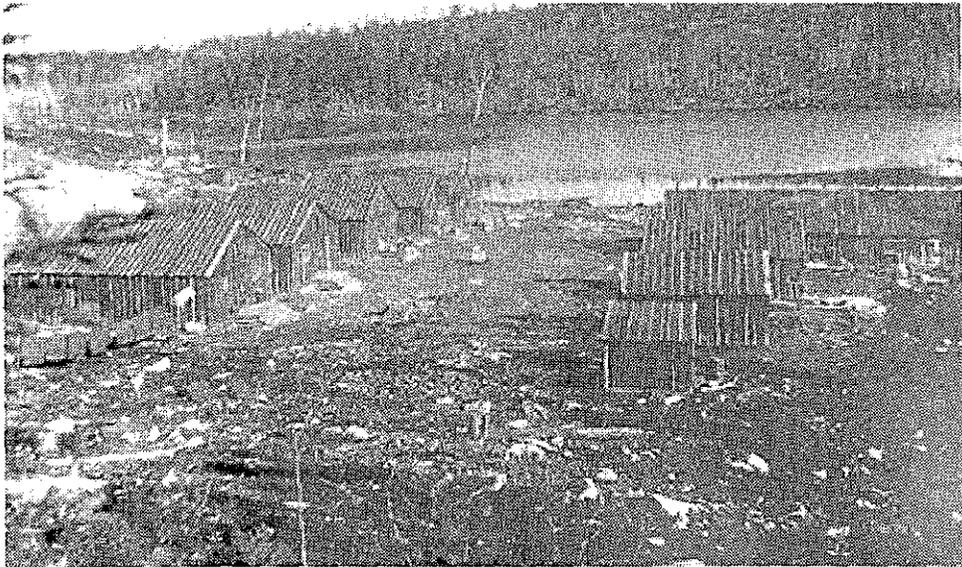


Figure 16: *Virginia and Rainy Lake Company, Camp 98, 1923, Spring Lake (Minnesota Historical Society, donated by Oswald Johnson).*

Sites of Virginia and Rainy Lake Company Camps
in Voyageurs National Park

Camp	Operation	Approximate Location	Type of Camp	Destination	Bd Feet
21	1912-13	Blind Ash Bay	Sleigh Haul	Lake Kabetogama	7,131,487
22	1912-13	S of Daley Bay	Sleigh Haul	Lake Kabetogama	No record
24	1913-14	Hoist Bay	Railroad		13,856,740
30	1913-14	NE of Lost Lake	Sleigh Haul	Lake Kabetogama	7,075,380
31	1913-14	Sucker Creek	Sleigh Haul	Lake Kabetogama	7,004,490
35	1914-15	Hammer Bay	Sleigh Haul	Namakan Lake	9,607,910
36	1914-15	Browns Bay	Sleigh Haul	Namakan Lake	6,419,210
46	1915-16	Crane Lake	Sleigh Haul	Crane Lake	6,428,220
53	1916	Mica Bay	Sleigh Haul	Namakan Lake	418,010
75	1919-25	Hoist Bay	Sleigh Haul	Moose River and Namakan Lake	13,615,685
80	1920-23	Lost Bay	Sleigh Haul	Namakan Lake	6,050,060
84	1920-23	N of Wolf Is	Sleigh Haul	Lake Kabetogama	6,348,100
85	1920-23	Nashata Pt	Sleigh Haul	Lake Kabetogama	5,140,980
99	1923-26	Little Shoepack	Sleigh Haul	Lake Kabetogama	14,074,390
100	1923-26	W of Shoepack	Sleigh Haul	Lake Kabetogama	10,586,240
103	1923-25	Little Shoepack	Sleigh Haul	Lake Kabetogama	8,370,420
111	1924-25	Sheen Pt	Sleigh Haul	Namakan Lake	1,680,170
113	1925	Oslo Lake	Construction		
115	1925-27	Wopika Lake	Sleigh Haul	Namakan Lake	7,586,370
118	1925-28	Cruiser Lake	Sleigh Haul	Namakan Lake	8,945,230
119	1925-28	N of Tar Pt	Sleigh Haul	Namakan Lake	8,144,695
129	1926-27	NW of Kubel Is	Sleigh Haul	Namakan Lake	5,660,460
130	1926-28	Tooth Lake	Sleigh Haul	Namakan Lake	7,999,930
131	1927-29	Mica Bay	Sleigh Haul	Namakan Lake	122,749,600
133	1927-29	Peary Lake	Sleigh Haul	Rainy Lake	6,706,740
136	1928-29	Kempton Bay	Sleigh Haul	Rainy Lake	5,122,970
137	1928-29	Kempton Channel	Sleigh Haul	Rainy Lake	4,801,340
143	1928-29	Hitchcock Bay	Sleigh Haul	Rainy Lake	5,847,780

Figure 17: Virginia and Rainy Lake Company camps in Voyageurs National Park (compiled from Eicholz n.d.; Fritz 1986; Krenz 1969; Perala 1967).

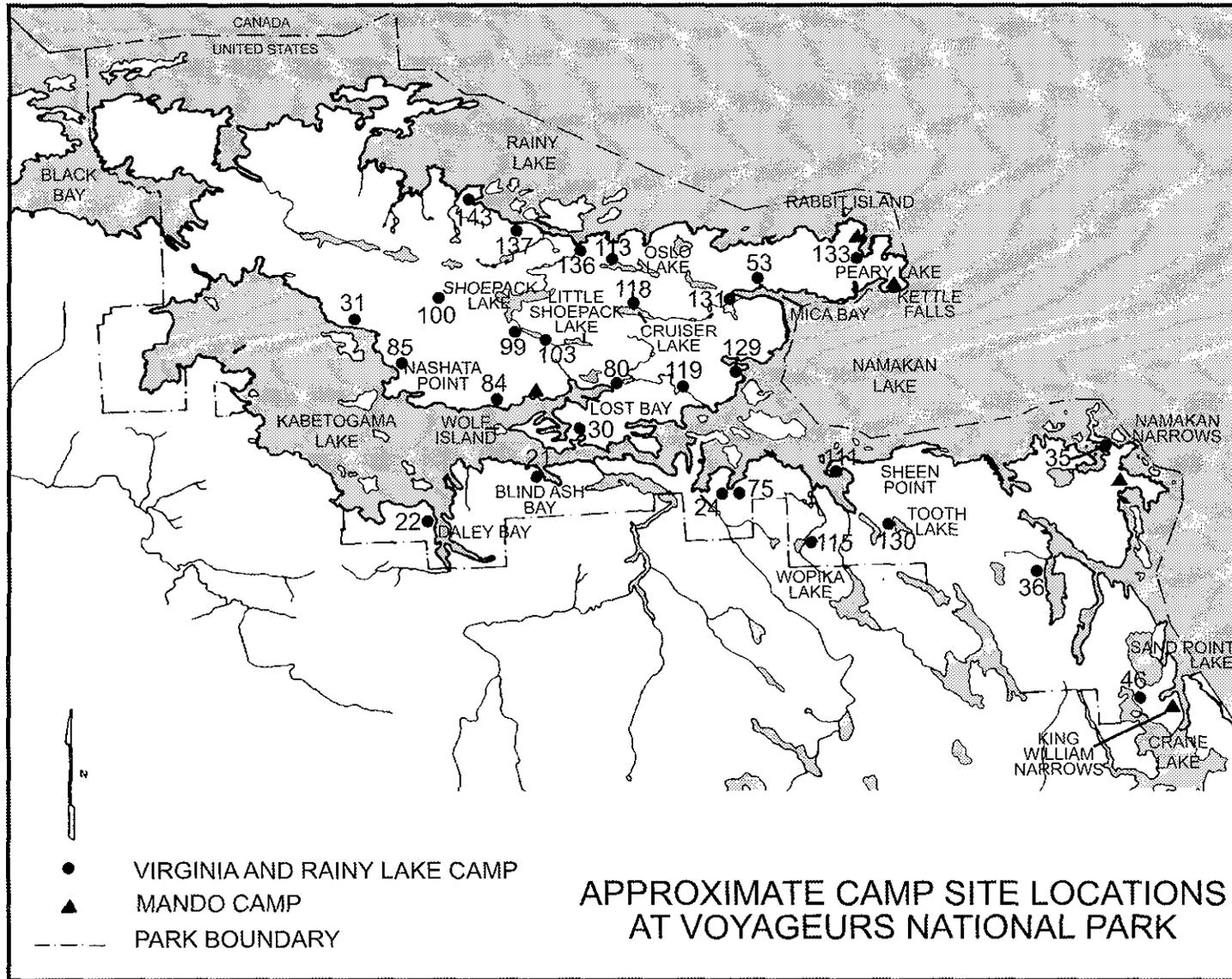


Figure 18: Approximate camp locations at Voyageurs National Park. Only some of these camp locations have been verified.

Bunkhouse or Bunkshack. J. C. Ryan wrote that this was the standard term for the sleeping quarters in a camp (Ryan 11-1-47). Walter O'Meara provided a description of early log bunkhouses:

By the tenth the walls of the bunkhouse were up. It is seventy-five feet long and thirty feet wide, and it is built entirely of full-length Norway pine logs. The logs were notched as at each end, so as to lock together at the corners. They were then slid up four poles and settled into place. . . It is amazing how accurately the "corner men" can notch these logs, so as to make strong, tight joints. . . The walls were then chinked with long V-shaped strips of wood, which were pounded tightly into the spaces between the logs and then plastered over with mud. On the inside, swamp moss was packed into the cracks. . . The roof of the bunkhouse is made of sawn lumber, brought up from Mokoman. The boards are nailed to a spruce pole framework and covered with tar paper. The floor is also made of boards (O'Meara 1947,p.71-72).

Ryan wrote that bunkhouses were usually five logs high, which is verified by historic photographs (Ryan 1975,p.24). A 30' x 75' bunkhouse (which Krenz agreed was the standard dimension for VRL bunkhouses) would have had 43 double-width bunks. O'Meara wrote that log bunkhouses had board roofs covered with tar paper and a hinged skylight at each end. One gable had a window. He wrote that early bunkhouses had log floors, but later log bunkhouses had board floors.

One variant of this description is the dingle-style bunkhouse, in which two large rooms were separated by a breezeway about eight feet wide. A single roof spanned both rooms and the breezeway, which was open. This was similar to the dog trot structures found in the upland south, although of a larger scale.

Cook Shack or Cook Shanty. Alex Gerber noted that the cook shack in the early Virginia and Rainy Lake Company camps "was large enough to hold all of the men at one sitting (referring to a 200 man camp), with 12 to 15 people working in the kitchen operation" (Gerber 8-7-75, p.3). O'Meara wrote that the cook shanty (his term) was "about the same size as the bunkhouse and that it was built according to the same specifications" (O'Meara 1947,p72). Krenz wrote that the VRL cook shacks measured 75' x 100' (Krenz 1969,p.65). The cook shanty had bunks for the cooks (O'Meara 1947,p.72).

Root House. This small log structure, located near the cook shack, was built into an earthen bank. It had two doors with a four foot wide space between them (O'Meara 1975,p.4).

Barns. Gerber noted that early Virginia and Rainy Lake Company camps had two or three barns (Gerber 8-7-75,p.3-4). O'Meara wrote that two barns would have housed about 35 horses in the early camps. Log barns measured about 30' x 80.' Krenz wrote that the VRL barns (probably of milled lumber) measured 40' x 60' (Krenz 1969,p.65). As with the bunkhouses, there was a dingle-style barn (two barns united by a single roof, with a passageway between).

Usually barns had hewn log floors, which Ryan wrote were balsam poles flattened on one side (Ryan 1975,p.25). Sherda Williams noted that the floors were slightly sloped to facilitate washing (Williams 10-14-98,p.3). The roof typically had three skylights. Inside, barns had rows of stalls on either side, with each stall accommodating two horses. Each stall had a manger for hay and a feed box in each corner. Barns were located near water, so horses could be watered there (O'Meara 1975,p.3).

Office. The office provided living quarters for the foreman, scaler, and clerk, and housed the camp store. Krenz wrote that the typical VRL office measured 20' x 20' (Krenz 1969,p.65). O'Meara described a typical office in his novel as:

. . . a low log structure, perhaps fourteen feet square, and made proof against the weather with wooden caulking strips and mud mortar; a door and square window facing the camp street, another window in the western wall. The rear corners of the room were occupied by double-deck bunks, built of sawn lumber and wide enough to accommodate two sleepers. A long, low cast-iron stove, set in a shallow box filled with sand, radiated its genial warmth from the center of the floor (O'Meara 1947,p.78).

Blacksmith Shop and Forge. The blacksmith shop measured about 14' x 18' according to O'Meara, and 20' x 20' according to Krenz. Its log construction was similar to that of the bunkhouse, although it had a shanty (shed) roof. The shop had two windows, one on a side wall and the other on an end wall. The forge, made of rocks and mortar, burned coal. The leather bellows were five feet long. An anvil and horse-shoeing equipment were in the shop, which was heated by a small iron stove (O'Meara 1975,p.4).

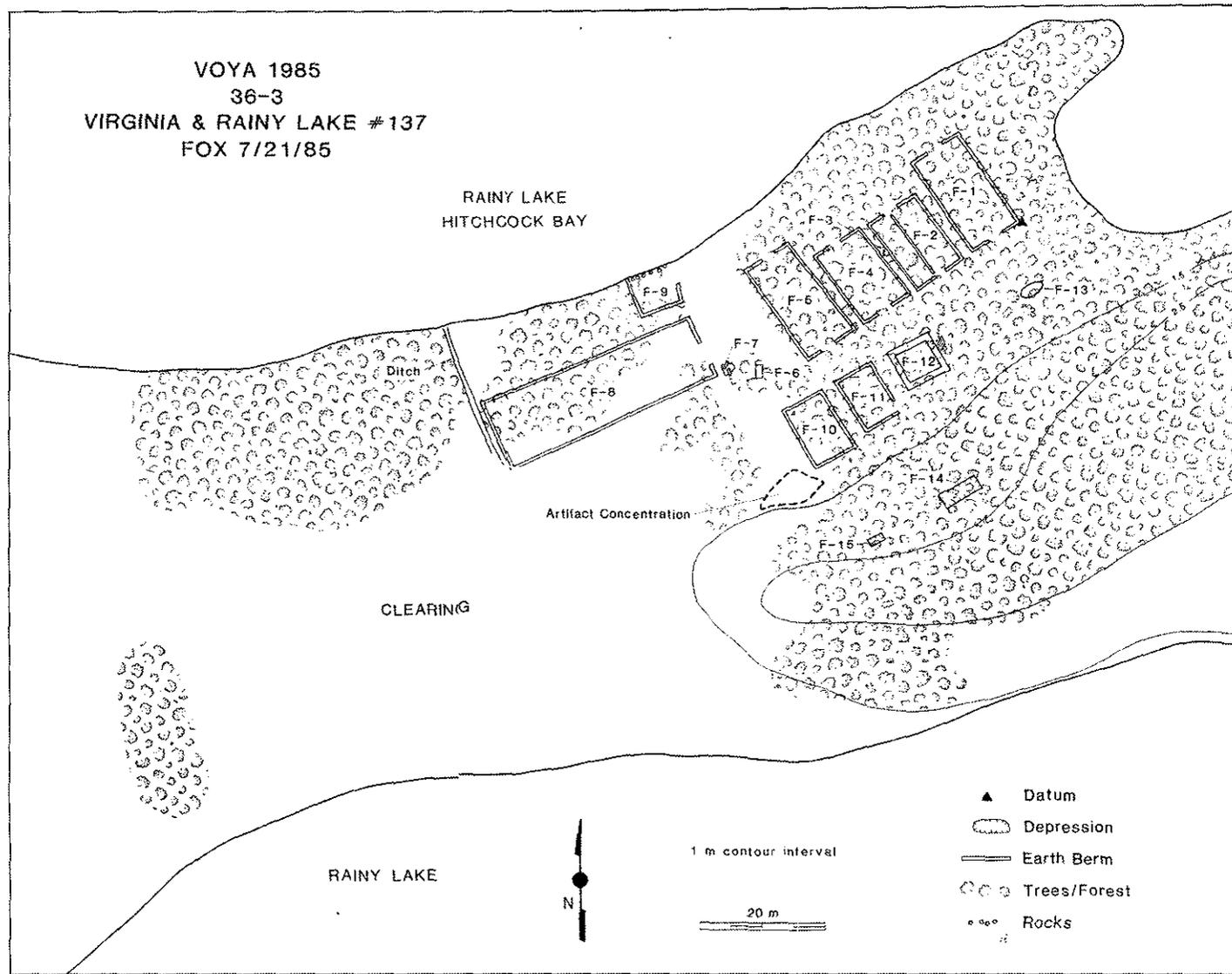


Figure 19: Plan of Virginia and Rainy Lake Company, Camp 137 (Mark Lynott, Jeffrey J. Richner and Mona Thompson, *Archeological Investigations at Voyageurs National Park: 1979 and 1980, 1986*)

Filing Shack. The filer, who kept the saws sharp, slept in this small log building. Measuring about 10' x 12,' the filing shack usually had a number of windows to provide good light (Ryan 1975,p.26). Men sharpened their own axes on one of the large grindstones at the camp.

Privy. The privy or outhouse, which could accommodate several men at once, was built over a long trench. It was situated a little way from the camp, and was moved when filled, but never during the winter (O'Meara 1975,p.4). O'Meara described a typical camp privy in *The Trees Went Forth*:

Our latrine, or privy, was no place for pleasant meditation. It was a long trench dug into the hillside a hundred feet or so beyond the other camp buildings. Over this trench had been erected a shack-roofed structure of logs, unheated, of course, and but poorly chinked, so that the snow often drifted in and froze upon the pole which served as a seat (O'Meara 1947,p.219-220).

Vegetable Gardens. O'Meara wrote that "company clearings" were sizable openings where vegetables and feed for horses were grown. At other camps, potatoes, cabbages, and rutabagas were grown on small plots (O'Meara 1975,n.p.). There is no indication whether the Virginia and Rainy Lake Company or the International Lumber Company maintained gardens, but Gerber said that fresh vegetables were bought for the VRL camps from "the homesteaders and local people who had farms" (Gerber 8-7-75, p.5).

Other. On the accompanying sketch by Walter O'Meara (Figure 14) a wood pile and pig pen are included. Discussions of camp food usually discount fresh meat as a staple, but, at camps that included animals, butchering could have been done. All camps would have had a wood pile if heating and cooking were with wood.

Late Logging: International Lumber Company and Mando Camps

The last of the logging camps were luxurious compared with the rough camps of the early logging period. Alfred Johnson left the last camp on the peninsula, at Kettle Falls, in 1964. He had served as the cook at camps on the peninsula from 1951 to 1962. An article about him reported that, except for modern kitchen equipment, the cook's job was the same as it had been for years.

Ed Nelson, a life-long lumberjack, worked for a year in 1924-25 in the area now encompassed by Voyageurs National Park; he then returned to the area in 1940 to work

again, cutting pulp for Mando. When asked by Mary Lou Pearson about where he lived when he returned, Nelson answered, "They had little shacks, and you stayed in the shacks and cut. . . You know where the spring is on the Ash River Trail" (Nelson 7-18-77,p.13). Nelson clarified that this was a little less than a mile from Highway 53. Although not in Voyageurs National Park, it is interesting to note that a cluster of shacks apparently was one type of camp during that period.

According to Salmi, the last camps of the International Lumber Company were located at the site of the Ellsworth rock gardens and at the second narrows past Ash River (Salmi 1971,p.15). Gerber mentioned a camp at the Kabetogama Narrows that International had abandoned in 1931 (Gerber 8-7-75,p.5). This was used as a CCC side camp for two years after the main camp was closed (McVay 10-16-98,p.3).

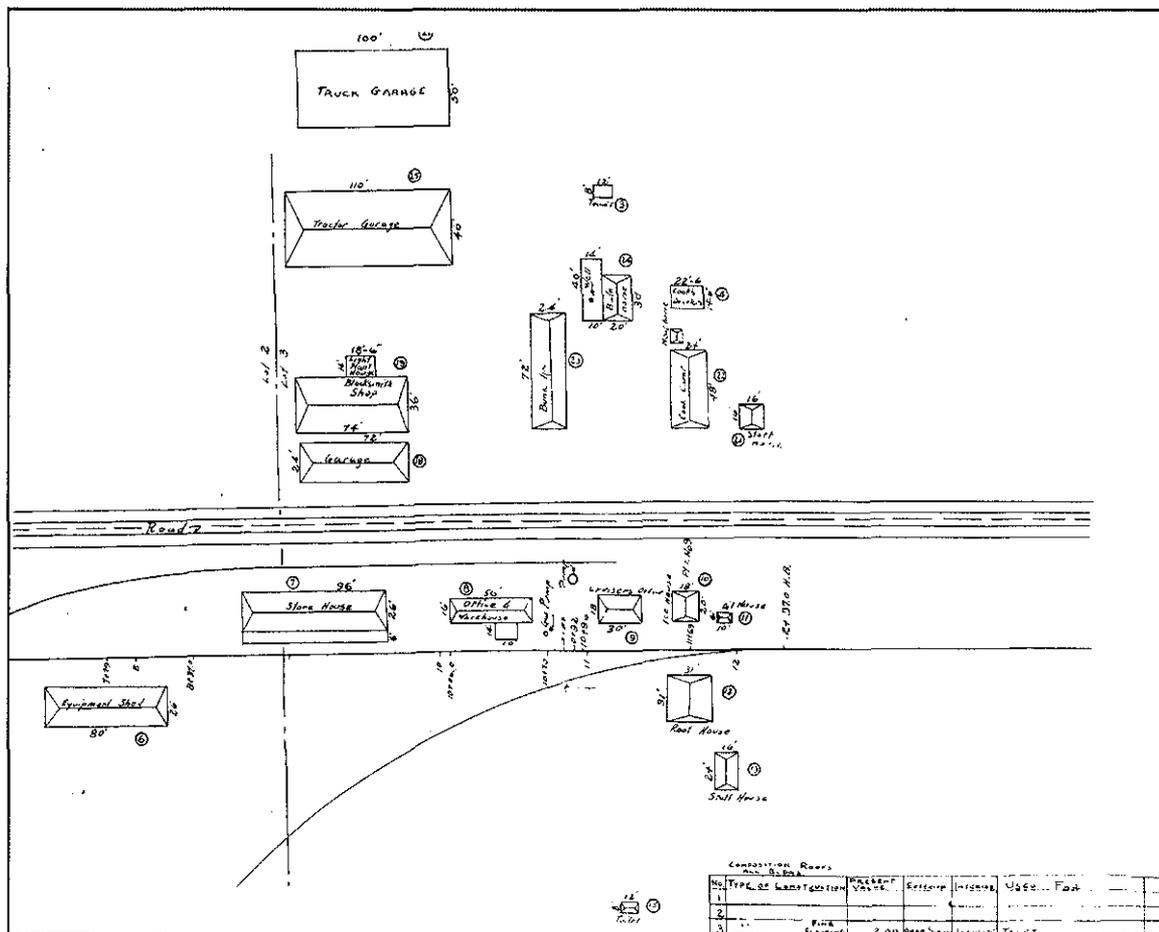


Figure 20: Mando Camp 29, 1945. This camp included large storage facilities for trucks and tractors, and roads and railroad tracks cross through the camp. It was located in Section 19-63-25, but may resemble camps built in Voyageurs National Park (Minnesota Historical Society).

During the 1930s through the early 1960s Mando-affiliated logging camps were located on the Kabetogama Peninsula. Amidon said that four loggers and their crews lived on the peninsula in the 25 years or so before it became a national park in 1971. They were Melvin Johnson, Alfred Johnson, Ole Thompson, and Joe Kocinski (Amidon 7-12-76,p.13). According to information obtained from Hilden, Johnson, and Amidon in interviews, camps were located at the following places:

- King Williams Narrows, Art Kimmel, foreman, 1930s (T67, R17)
- Sand Point Lake, Jack Dwyer, foreman, 1930s (T68, R17)
- Lake Kabetogama, Lost Bay, Joe Poquest, foreman, 1930s (T69, R20)
- Rainy Lake, south of Rabbit Island, Alfred Johnson, foreman, 1949-c.1954 (T69, R17)
- Rainy Lake, c. 5 miles west of above, Alfred Johnson, foreman, c. 1954-?
- Hilke Bay (a.k.a. Snowflake Bay), near Kettle Falls, Alfred Johnson, foreman, 1961-?

The camps on Sand Point Lake and at King Williams Narrows would be in Voyageurs National Park if they were on the western side of these bodies of water; otherwise they would be outside the park. Johnson described the camp at Hilke Bay as follows:

I think we had either four or five bunk houses, with about eight in each one of them, about 40 men there plus the kitchen help. There was probably about 45 men in that camp. There was about 10 structures on that camp site (Johnson 4-11-77, p.14).

George Amidon provided a description of a camp on Rainy Lake operated by Alfred Johnson:

. . . it was a regular, old style logging camp; by that I mean that there were bunk rooms, a shop and a cook house. There aren't any such camps left in Minnesota. This was a difficult operation because the only access was by boat or ice roads. . . I think it was a 70 or 80 man camp. They served excellent food. . . this camp operated for five or six years at this location and then moved five or six miles or more west. This was Alfred's second camp. These were the only real old time camps in the area during this period (Amidon 7-12-76,p.13).

In 1934 Larson visited some International Lumber Company camps and described how camps had changed from earlier times:

The camps where the men lived who were doing the final logging in Minnesota were deep in the forest, remote from civilization. In summer they were reached by a long boat trip on Rainy Lake; in winter only dog teams could reach them. These camps were fresh and well kept; they were light and airy, with big windows and doors carefully screened. The spacious sleeping houses had iron bedsteads, quite unlike the old muzzleloader bunks. Hot and cold running water, shower baths, and electric lights made one forget all about the old State-of-Maine camp, which Minnesota loggers had first known (Larson 1949,p.402).

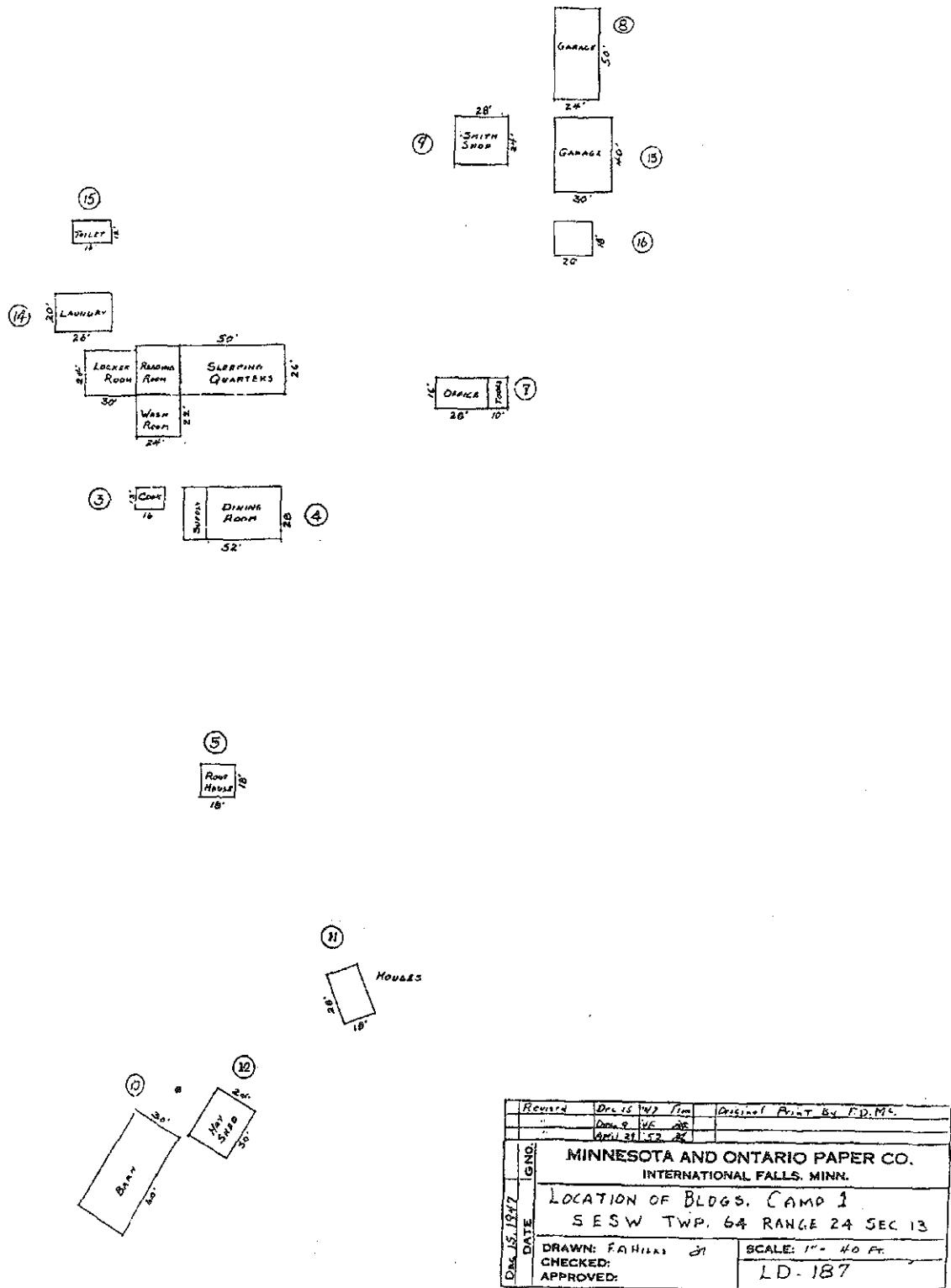


Figure 21: Mando Camp I, 1947. This Mando camp had a reading room and wash room attached to the sleeping quarters, amenities that were unheard of in earlier camps (Minnesota Historical Society).

Alex Gerber noted that the addition of bath houses was a result of the IWW strike in the 1930s (Gerber 8-7-75,p.5).

Mando also contracted with “jobbers,” who had shacks or small camps. The following locations were noted by Hilden and Amidon:

- Junction Bay, 1930s (T68,R18)
- south of Black Bay, Melvin Johnson’s portable camp, possibly early 1950s

During the big fire of 1936 on the Kabetogama Peninsula, several camps were established to fight the fires. These camps may have been built on areas that previously had been used as logging camps; therefore, the sites would exhibit two layers of artifacts.

Trygg recalled the following camps (Trygg 8-29-75,p.22):

- Shoepac Lake
- Lost Bay
- Johnson Bay
- Mica Bay
- Browns Bay
- Cruiser Lake (operated 1 day)

Voyageurs National Park also was the site of CCC encampments of a semi-permanent nature or of very fleeting duration. These also may have been built at former logging camp locations. Camps were known to exist in these general locations:

- tent camp off Highway 53 outside the park (T68, R21, S14) operated in the summer of 1933 (Trygg 8-25-79,p.2)
- permanent camp near Gappas Landing, Kametogama Lake, outside the park, occupied 1933-38; may be VRL camp 29 (T69, R21,S17) (Trygg 8-29-75,p.2&4)
- camp at Kabetogama Narrows, abandoned by Backus and Brooks Company in 1931; occupied by CCC from 1934 to 1936 (Trygg 8-29-75,p.5)
- tent camp “on the north shore of Lost Bay where the trail came out from Shoepac;” operated 3 months in 1934 (Trygg 8-29-75,p.4)

After 1962, the era of “shackers” began. “A shacker is a lumberjack who stays in the woods but has to do his own cooking unless he can organize a little cooperative with fellow lumberjacks and maybe hire a housekeeper” (*Rainy Lake Chronicle*, 3-17-74). This short-lived arrangement heralded the end of the days of logging camps. At Voyageurs National Park the end nearly coincided with development of the park—when the era really did come to an end.

Related Property Types: Stopping Places/Hotels and Stills

These two categories of property types could have occurred in any of the three phases of the logging industry at Voyageurs National Park. Their definition at this time (prior to a complete survey) does not include temporal limits because too little is known. A brief description of each type follows.

Stopping Places/Hotels. Stopping places specifically associated with the logging industry are a potential resource at Voyageurs National Park, although in general stopping places most commonly are associated with gold mining, early settlement, and users of transportation networks. At Kettle Falls, Harry Berger ran a trading post and stopping place at least until 1909 (Drache 1992,p.275). In 1912 another stopping place was built at Kettle Falls by Oliver and Anne Knox, and in 1913 the Kettle Falls Hotel was built by Ed Rose. These facilities served the large number of people who were in the area due to the dam construction and nearby logging camps. After the dam was finished, 120 people lived in the vicinity of the dam (Drache 1992,p.276). They also served the emerging tourist trade. The Kettle Falls Historic District, which is listed in the National Register of Historic Places, is considered significant for industry, transportation, and commerce (recreation).

Rainy Lake City, which was located on Kabetogama Lake about 13 miles east of where International Falls developed, had stopping places or hotels that probably served lumberjacks, as well as gold seekers. Because the community was abandoned by about 1906, remains would pertain to the "early logging" period. This association should be evaluated as a potential area of significance at the Rainy Lake City site. The sites of other stopping places known to have existed within or near the park have the potential for revealing information about these operations.

Stills. During the 1920s, the moonshine trade was brisk in the border country. According to Drache, "stills were so numerous in the north woods that any number of revenueurs could not have hoped to stamp them out" (Drache 1992,p.209).

According to Ed Nelson, stills located in what is now Voyageurs National Park provided liquor to the camps. Harry Maines operated a still near the Hoist Bay camp, but apparently it was burned by the Virginia and Rainy Lake Company. There also was a still

at Claypipe Johnny's Falls on the Ash River—so named because an Indian by that name had a moonshine still on the point that was later the site of the Lindgren cabin. There was another still at Junction Bay, one at Catin (sic) in Blind Indian Narrows (not associated with the Cayton family that lives in the area today), and another about a mile from Hoffman's store (Nelson 7-18-77, p.25-26).

Properties associated with the distillation of alcohol probably were cabins or shacks and, perhaps, cooking structures. Stills are not like to be standing structures, but may be significant archeological sites.

Integrity Requirements for Camps and Related Structures

The sites of camps and other structures associated with logging typically are nominated to the National Register under criteria A and C, and often under criterion D. At Voyageurs National Park, these properties most likely are not standing structures. There is the remote possibility that an existing building (on or off site) will be determined to be a former camp building or related structure that was moved. But, for the most part, these resources will be archeological in nature.

Properties should possess most of the aspects of integrity stipulated by the National Register criteria to be considered eligible. Suggestions regarding the application of each aspect of integrity to camps and related structures follow. The definitions of the integrity aspects are taken from *National Register Bulletin 36: Guidelines for Evaluating and Registering Historical Archeological Sites and Districts*.

Location. *The place where the historic property was constructed or the place where the historic event occurred.* The sites of camps and related structures should be in their original locations, so integrity of location generally will not be an issue. However, exceptions may occur.

Camp structures that were floating (such as wannigans) may be underwater, and their preservation may be enhanced by moving them to another location. If a wannigan sank after it was used by the logging camp, its integrity may already have been compromised. Two NPS publications present suggestions regarding the assessment of location: *National Register Bulletin 40: Nominating Historic Vessels and Shipwrecks to the National*

Register of Historic Places and National Register Bulletin 36: Guidelines for Evaluating and Registering Historical Archeological Sites and Districts.

Camp buildings and related structures that have been moved from their original locations have lost their integrity of location.

Design. *The combination of elements that create the form, plan, space, structure, and style of a property.* Retention of the design, or layout, of a camp is critical to its significance. To be significant, therefore, sufficient remnants or evidence of the majority of buildings should remain to convey the plan of the camp. If not, the property may still be eligible under criterion D.

Setting. *The physical environment of a historic property.* The setting may include topography, vegetation, buildings and structures, and open space. If a property is significant for its information potential (criterion D), the setting is not critical. However, for a property to be significant under other criteria, the setting should resemble its appearance during the historic period.

Vegetation is an aspect of the setting that probably has changed. During the period of significance, camps would have been surrounded by sparse vegetation, or even stumps. The vegetation that did exist in the vicinity of camps may have consisted of different species than exist today. Because this feature of the camp site setting is not likely to be intact, other components of the setting should correspond with historic qualities.

If properties are being evaluated under criteria A and B, the setting has been compromised if buildings, structures, and other human-constructed elements that post-date the period of significance are present.

Materials. *The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.* Camps as archeological sites would have integrity of materials if foundation remnants or berms at foundations remain, and if an artifact assemblage from the period of significance is present. If the site is greatly disturbed, the site may not possess integrity of materials. For example, material integrity may not exist if the foundation is not evident, the foundation berm has been significantly eroded or destroyed, and artifacts are few.

Workmanship. *The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.* “Workmanship” at these sites would be most related to the quality of construction evidenced in building remnants and the workmanship evident in artifacts.

Feeling. *A property’s expression of the aesthetic or historic sense of a particular period of time.* Integrity of feeling at these sites is most related to the integrity of the setting and location. Most of the park’s camps were located in remote areas, where no other development was evident—for most of the camp sites, this still is true. In other words, the place still conjures the “feel” of where a logging camp would have been located. Camp sites located in areas that have been developed since the period of significance, probably have lost their historic feeling.

Association. *The direct link between an important historic event or person and a historic property.* The association between logging and the camps and related structures must be very clear. If there is a clearer association between a site and a subsequent or earlier activity, or if the association with logging was fleeting and insignificant, the association probably is too weak to be considered significant.

7. PROPERTY TYPE 2: TRANSPORTATION SYSTEMS

Everything depended, in the end, on roads.

Walter O'Meara⁷

Logging in the border country was dependent on a complex network of several transportation systems. To reduce those systems to "roads, rails, and water" would imply a simplicity that did not exist. Different types of roads were built for different purposes—their construction, configuration, and route depended on their function. As with railroads, different methods of laying track and different destinations indicated specific purposes. Even water routes in the border country had specific functions—some routes were better than others for driving logs, for example.

In the early logging period, waterways were used almost exclusively for transporting logs. With their use came modifications in the form of dams and sluiceways for channeling the water and making it more amenable to log drives.

In the second phase of logging, waterways continued to play critical roles in hauling and toting. O'Meara described their importance:

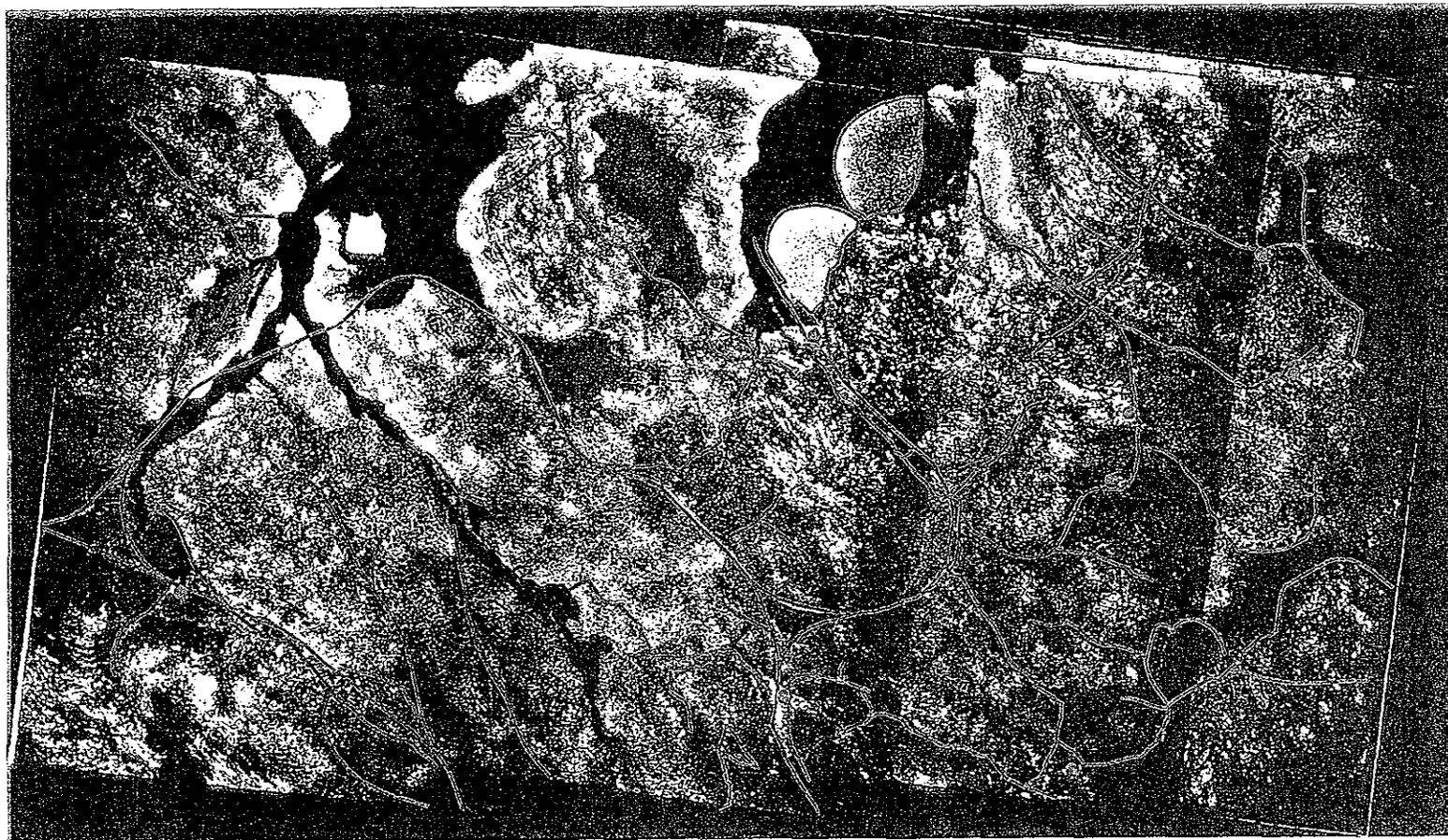
In winter, the rivers themselves were used for hauling, and on the St. Pierre alone the great tote-sleighs, each loaded with its two tons of camp supplies, would form almost continuous processions coming and going to the woods (O'Meara 1947,p.32).

However, the key to the dawning of the second phase of logging was the arrival of railroads. Railroads alone could not serve the remote forests of Minnesota's border country—it was their operation in the context of waterways and roads that led to their success. Thus, a complex interrelationship between transportation systems was developed to harvest the vast wealth of the border country's forests.

⁷ Walter O'Meara, *The Trees Went Forth* (New York: Crown Publishers, 1947).

Hoist Bay Area, 1928

Historic Logging Activity



Assistance provided by:
NPS, MWSO-GIS

⊙ Cleared Area
▭ Booms
≡ Roads and Railroads



Data obtained from:
Aerial photographs taken by the
International Joint Commission

Compiled from scanned, registered,
and mosaiced aerial photos.

Figure 22: Hoist Bay area logging activity, 1928. This map was produced in 1998 from scanned, registered and mosaiced aerial photographs that were taken for the International Joint Commission in 1928.

The accompanying map of Hoist Bay, developed from 1928 aerial photographs, shows just what an incredible network of roads and railroads existed. Hoist Bay was an unusually busy camp and, in a sense “all roads led to Hoist Bay.” Most of the Virginia and Rainy Lake Company logs were hauled or driven to Hoist Bay to be lifted onto flatcars and hauled to Virginia. Thus, at Hoist Bay the transportation network was more complicated than at any other site at Voyageurs National Park.

The majority of the roads and railroads built to serve the far north’s logging industry were considered temporary. In fact, many were dismantled or otherwise obscured as logging lost a need for their use. Others were practical routes to reach a given destination, and permanent roads were later built on the same course. At Voyageurs National Park, those that have not continued to be used as park roads or trails have nearly vanished over time. Vegetation has staked a claim, ranging from forests, to shrubs, to grasses. Because of the encroachment of vegetation, it would be impossible to develop a map of Hoist Bay from field observations today, like the one made from historic aerial photos.

Transportation corridors are one of the most distinguishing cultural remnants of the logging era. Descriptions of each corridor type will contribute to its identification and evaluation.

Roads

Before lumber could be hauled from the woods to the lake, river, or railroad to be transported to mills, roads had to be built for moving the logs out of the woods. When camps began to be built of milled lumber instead of logs, roads had to be built to carry in supplies for their construction. Most of the roads built by lumber companies were used only for the year or two while a given area was logged. Others provided vital access to areas that were being settled by homesteaders or being logged by small logging operations.

The two types of roads were tote-roads and hauling roads. Each type of road had distinct characteristics regarding function, placement on the landscape, and method of construction.

Tote-roads. Frank Gillmor wrote that a tote road was used to haul supplies, not to haul logs. J. C. Ryan agreed, noting that:

"Toting" is a little known part of the early logging industry, but a very important part. . . before a camp was constructed a way had to be found to bring in lumber, tarpaper and nails; and as soon as camp work began, supplies and food for the men and horses were needed regularly (Ryan 1975,p.46).

Tote roads generally ran from the railroad, lake, or river to a camp. They were laid out on ridges and high ground to avoid swampy and low areas, because the tote wagons carried very heavy loads and getting stuck in the muck of low-lying areas was to be avoided, even at the cost of laying out circuitous routes that wound through higher country. The roads usually were about six to twelve miles long, although they could be much longer (Ryan 1975,p. 47).

O'Meara described a tote road in the vicinity of the mythical Mokoman that could help explain tote roads in the border country:

For more than fifty miles the Old Road squirmed and twisted its way north and west. It was the main stem in a vast system of tote-roads which, with its roots in Mokoman, spread like a tree of life on a Numba rug through a thousand square miles of Minnesota wilderness.

. . . But until the broad St. Pierre and its tributaries were frozen solid early in December, many of the forty-odd camps that based their operations on Mokoman still depended for equipment and supplies upon the tote-roads that had been hacked through hundreds of miles of brush and swamp and timber. And of these, the Old Road was one of the most important (O'Meara 1947,p.32-33).

O'Meara wrote that secondary tote roads branched off the main tote roads, "usually to follow some tributary of the river; and like twigs, still lesser roads took off from these" (O'Meara 1947,p.33). Bryant wrote that secondary roads were inferior in construction because they were only used for one season and a smaller amount of timber was hauled over them (Bryant 1913,p.164). O'Meara described how rough travel on such a road could be:

We had crossed the Ojibway now, and were on a secondary road which followed a twisting north-westerly course inland. . . . The going was much more difficult than it had been earlier in the day; the road was now little more than a track through the cutover. It followed wherever possible, and however circuitous, the contours of the land, going around all obstacles, even large stumps and boulders. Hence, its course was almost never straight, seldom level; and at times the wagon tilted hazardously on the slopes and slanting shelves of rock. With increasing frequency, deep pot holes forced a pause in our journey until brush and poles could be cut and the holes filled up (O'Meara 1947,p. 44).

Hauling or Logging Roads. Frank Gillmor explained that a logging road was used for hauling logs, not for hauling supplies or any other transportation purpose (Gillmor 12-16-47, p.1). O'Meara described the importance of logging roads and their construction in the following passage from *The Trees Went Forth*:

The skill with which you ran your roads determined the number of teams and teamsters you would need, the length of your hauls, the size of your loads, and the time you would have to spend in building, icing and maintaining the roads themselves. Nothing save the weather was more important than roads. And so, well up to the middle of December, they were the topic of much of Dempsey's and Dawson's talk and contention, as they pored over crude, hand-drawn maps beside the office stove.

When Dempsey and Dawson first arrived at Tobin late in October, they carried with them cruisers' memoranda on the amount and quantity of timber on each of the forty acres to be logged that winter. The objective was to cut the timber and take it to Loon Lake, whence it could be floated in the spring down the Little Sioux, Ojibway and St. Pierre Rivers to Mokoman. The problem: to find the shortest practicable routes between the timber and the landing on Loon Lake.

. . . by the first of November most of the main routes had been blazed. From then until well after Christmas a good deal of the crew's time was devoted to road building.

Our main hauling road may be likened to the principal stream of a river system. It closely followed Wolf Creek, which insured a down grade over its entire length, and extended from the lake to the back end of the "works"—that is, to the most remote stand of timber. Its over-all length was about five miles. Although the road itself was only ten feet wide, it was necessary in building it to cut a swath thirty feet in width through the timber. When iced to a depth of a foot or more, it formed a smooth crystal highway over which huge loads of logs, sixteen feet wide and ten high, could be hauled with ease by a team of horses.

Into this broad and beautiful highway numerous branch roads fed from the timber like streams into a river. They too were hauling roads, but narrower and iced more lightly, since some of them, perhaps, would be used for only a single day. And, finally, into the branch roads from the snowy depths of the forest, trickled the narrow skidding trails over which logs were "snaked" by horses to the roadsides. Four "road monkeys" and two sprinkling men were charged with the care and icing of all these roads.

The building of the roads, once the way was cleared of trees, required not only much pick-and-shovel work, but considerable dynamiting as well. There must be no rocks in the roadway; and all grades must be level, or gently descending. So important was this latter stipulation that main hauling roads would sometimes go

half a mile “out of the way” to avoid a five or ten foot rise. So, with the aid of dynamite, small cuts were made when necessary; depressions and ravines were filled with dirt and with tamarack, birch and poplar poles. When it was utterly impossible to avoid a steep hill, a “road monkey” was stationed at all times to keep hay or sand in the sleigh tracks (O’Meara 1947,p.99-101).

Ryan wrote that hauling roads travelled along creek bottoms or swamps—any route was better than hills, even if it required building bridges. Road building usually took place in the fall. Rocks and stumps had to be removed, sometimes with dynamite. When the water would freeze, tanks began to pour water into the road beds. In six weeks or so the ice would be about a foot thick and the rut cutter came through, making ruts for the sleigh (Ryan 1975,p.27).

Walter O’Meara described a tote-wagon in *The Trees Went Forth*:

Our tote-wagon was almost, but not quite, typical of the heavy Deering wagons that were commonly used for hauling. It had the usual over-sized wheels, with long spokes and heavy rims, necessary to cope with the pot holes, tree roots and boulders on the roads. But it had been built in the Zenith Lumber Company’s own shops, stouter and heavier than was usual, with huge axles and hubs so large that they resembled beer kegs. With a full ton of weight aboard, even Benson’s fresh, strong horses—each weighing at least 1,600 pounds—were forced to struggle with the load as we pulled up the Big Hill immediately across the river (O’Meara 1947,p.33-34).

Larson attributed innovations introduced in 1890 as a major factor in the increase in productivity that began in that year. Wrote Larson:

As Michigan men settled in Minnesota, they brought the ice road in their assortment of new methods. Minnesota had ice roads before, but the new ice road was an improved one. A rut cutter, somewhat like a sled runner, made deep grooves into which the runners of the sled would fit. Then runners superheated with steam were passed over the ruts and the cold winter air changed the steam into ice. In these slippery ruts the loads would slide easily. Such roads made possible bigger loads drawn by fewer horses (Larson 1949,p.364).

During the third phase of logging, when trucks and other vehicles needed good access to logging areas, some good roads finally were built into logging regions. George Amidon noted that,

Finally our logging contractors with the help of the paper company, built winter logging roads into the peninsula. The logging road came in from off of Highway 53 and went in just south of Black Bay and then east, I presume about 15 or 20

miles. It didn't quite get to Kettle Falls, but I think it was within five or six miles of Kettle Falls (Amidon 7-12-76,p.4).

A 1958 map of the Minnesota and Ontario Paper Company operations (Figure 13) shows the road Amidon described. The same map shows "winter roads" that led to the lakes in the area that is now Voyageurs National Park.

Railroads

In his "First Annual Report of the Chief Fire Warden" (1895), C. C. Andrews stated that "the most striking improvements in the logging business is the construction of railroads, with numerous little branches into the very center of the best pine forests, and the rapid removal of the logs on an extensive scale" (Andrews, 1895, p. 133). The introduction of rail hauling to Voyageurs National Park, in fact, defines the transition to the second phase of its logging history. The end of the use of railroads hails the exit of this phase.

Main lines. By 1905 the Duluth, Virginia and Rainy Lake Railroad extended as far north as Cook from Virginia (66 miles south of Fort Frances) due to the goal of Wirt H. Cook and William O'Brien to move lumber from their northern holdings to Virginia. They had chartered the Duluth, Virginia and Rainy Lake Railway in 1901, but in 1905 their interest in the railroad was acquired by the Canadian company, Mackenzie, Mann and Company, and the road was named the Duluth, Rainy Lake and Winnipeg. Two years later, 16 more miles were constructed, between Cook and Glendale, and by 1907 the road was completed to Ranier, on the Rainy River across from Fort Frances. At the same time, the Virginia and Rainy Lake Company was formed by lumber magnates Hines, Cook, O'Brien, and Weyerhaeuser. The company connected its vast holdings north of Virginia to the main line of the Duluth, Rainy Lake and Winnipeg Railroad at several points. Cusson became the headquarters of the VRL logging railroad operations. At Cusson and Kinmount the VRL extended a line to the east and north to access the rich timber reserves in that region. Eventually, the Virginia and Rainy Lake Company laid nearly a thousand miles of track, most of it temporary spurs (Ryan 1975,p.32).

According to Ryan, "standard gauge tracks were used by all companies operating in Minnesota" (Ryan 1946, p. 302-03). However, Mary Graves and Jeff Richner have found

evidence of narrow gauge rail lines in the vicinity of Moose Bay and Hoist Bay in Voyageurs National Park. In the spring of 1999 they discovered railroad artifacts related to a narrow gauge operation, including wheels of narrow gauge trains (Graves 5-11-99).

The locomotives hauled flatcars loaded with one or many tiers of logs, depending on the terrain. On main lines, a train of twenty to thirty-five cars was typical. Ryan noted that, because they stopped so often along the way, the trains could only cover 50 or 60 miles in a day (Ryan 1946,p.305). Lumber companies were careful to site railroad lines to incur the lowest construction cost and the most efficient haul, thus level terrain was preferred.

Spur lines. A network of spur lines was built to haul the timber from the forests.

“Whenever possible spurs were laid within skidding distance of all available timber—seldom more than a quarter of a mile,” wrote Ryan. However, much of the timber had to be skidded by teams for several miles to the tracks. Later, tractors took over this job (Ryan 1946,p.304). Hoist camps were built at the termination of spurs. Timber was floated or hauled to the hoists, then carried out by rail.

Skeleton tracks were spur lines laid in the winter over the frozen ground, without ballast. The ties and rails were considered temporary (Ryan 1946,p.301). They could cause problems, according to Ryan, because they

. . . were subject to “sun kinks,” which appeared at the joints when it warmed up and the rails expanded. They caused the derailment of many log cars. In rough country much trouble was caused by what was known as “running steel,” which developed on tracks where most of the log loads were hauled in one direction. Heavily loaded trains moving down steep slopes had a tendency to work the rails down with them, and when the steel became tight it would kink and derail the train (Ryan 1946, p.305).

Spurs used year-round had to be well graded, with tracks laid in gravel beds. If a spur crossed a swampy area, trees would often be laid on the bed and ties put on top of them. “It is surprising how well the swamps held up when a proper mat of timber was laid in advance” (Ryan 1946,p.305).

Skidways. Landings along railroad tracks where logs were stored until they were loaded onto flatcars were commonly called “skidways.” Skidways may have been several hundred feet long if logs were stored along the track for a number of weeks before being

loaded. If logs were loaded as they were brought to the track, less storage space was required (Bryant 1913,p.143). Bryant explained that skidways differed if trains were being loaded by animals instead of by power loaders:

With animal loading it is essential that the logs be carefully piled parallel to the railroad track. The skidway consists of two continuous rows of poles placed about 8 feet apart and extending at right angles to the track for a maximum distance of 100 feet. The logs are brought to the rear of the skidway and rolled toward the track, leaving a clearance of approximately 10 feet between the first log and the rail. Logs are seldom decked more than four high as it is more economical to place new skids than to spend time in decking.

Where power loaders are used, skidways are often merely areas along the track from which the brush and debris have been removed so that the teams can deliver the logs. In a flat region where plenty of space is available the logs are seldom decked. It is unnecessary to have logs arranged parallel to the track or placed on skids since the loader can pick them up readily at distances not to exceed 100 feet. If there are steep slopes near the railroad, logs are often hauled to the edge and rolled down by gravity, forming a "rough and tumble" skidway. This provides a large storage area and reduces labor in handling the logs. Since a power loader can readily pick up logs several feet below the level of the track the logger can locate his railroad without reference to loading sites (Bryant 1913,p.143-144).

On the map of Hoist Bay produced from 1928 aerial photographs (Figure 22), the skidways appear as clearings along the tracks (and, perhaps, roads). At this scale it is impossible to ascertain the dimensions of the skidways, nor can it be considered a comprehensive map of skidways. Even so, it is interesting to note their occurrence.

Virginia and Rainy Lake Company Railroads. The rail line that served the Voyageurs National Park area was a Virginia and Rainy Lake Company line that extended to Hoist Bay. This track branched off the Duluth, Rainy Lake and Winnipeg Railroad (until 1905, the Duluth, Virginia and Rainy Lake) at Kinmount and headed northeast. All of the Virginia and Rainy Lake Company logs hauled on these lines were headed for Cusson. Alex Gerber said, "The railroad tracks laid from out of Cusson ran north in a northerly direction to Namakan Lake and also in an easterly direction across the Vermillion River over to the Superior National Forest . . ." (Gerber 8-7-75,p.9-10).

Ed Nelson said that in 1927 the tracks that led to Hoist Bay were removed and replaced with a road (Nelson 7-18-77,p.27). They eventually became part of the Ash

River Trail, and before the road was paved, timbers (ties) periodically resurfaced (Williams 10-14-98,p.3).

The VRL Company eliminated the evidence of its rail lines almost as well as it did its camp sites. Beatty described what was done with the lines to make them impassable to “transient families from mid-southern states (who) were waiting to move into the cutover country once the rails were removed:”

The abandoned ballasted railroad grades created a problem upon which we had to act fast. . . the local game wardens took immediate effective action to make the railroad grades impassable for automobile use. Following close behind the rail steel lifting crews, three or four-man crews of state patrolmen and game wardens destroyed the timber bridges and culverts. They also restored adjoining trapper-breached beaver dams which permitted the upstream water to submerge low lying right of ways. The west section of piling on the long span of the bridge across Ash River on the Cusson-Namakan main line was also severed by blasting charges which made the structure impassable for all time (Beatty March/April 1966,p.64).

Because these actions were not completely effective, even more bridges and culverts were blasted out. The rationale for this destruction was that dry weather and slash piles created a fire hazard, and that trees needed a chance to reclaim the land. Beatty concluded that the “quarantine” paid off and that the area was spared devastating fires.

Backus Empire Railroads. “As part of his logging operations Ed Backus built hundreds of miles of logging railroad” (Comeau 1950,p.5). The tracks that were built to access timber were called spurs, branches, or side tracks. They were kept in place until the timber was gone, probably about two years, then pulled up. The steel was re-used, as were the ties that were still in good condition (Nelson 7-18-77,p.33).

International Lumber’s spurs were built in 40 foot wide cleared corridors, with a grade that was 12 feet wide. On either side of the grade, two to three foot deep ditches were run at a one to one-and-a-half foot slope. Large stones and stumps were removed from the grade, unless they were well below the surface. Specifications for cut and fill were mandated by the company. Cuts sloped one to one-and-a-half per cent and had 16 foot bases. Fills were comprised of soil or timber of no market value, placed across the grade, and covered with at least 12 inches of soil. Culverts were made of timber, “hewed on two sides and laid on cross mud timbers, well spiked together, well braced and covered with sound timbers” (International Lumber Company 9-1-22,p.1).

It is not clear whether the International Lumber Company or Mando ever built rail lines into the area encompassed by Voyageurs National Park. Both companies operated extensively in the Kabetogama Peninsula, but documentation regarding rail lines has not been found. Because International Falls was the destination for their timber, it could be driven by water to the mills there, unlike the timber destined for Virginia.

A Note on Trains. Alex Gerber, who was a locomotive engineer with the Virginia and Rainy Lake Company after World War I, worked in the camps, “switching these logs from the camps.” Comparing the railroad work in the camps with his work in the roundhouse in Cusson, Gerber noted that “this kind of railroading was different than working on one of the standard roads” (Gerber 8-7-75,p.8).

The powerful Lima locomotives, with a maximum speed of 12 miles per hour, were geared to handle steep inclines. They were perfect for “the short, steep grades that the branches of the logging road were made up of” (Gerber 8-7-75,p.9). Ed Nelson referred to the Delaney locomotive, which was driven with only one gear, allowing it to climb hills (Nelson 7-18-77,p.33). The size of the load possible depended on the grade of the track. On steep grades one flatcar holding two tiers of logs might be pulled (about 6,000 board feet), while on flatter grades five or six flatcars could be loaded.

Salmi noted that the Virginia and Rainy Lake Company owned “fourteen locomotives with weights of 45 to 75 ton, ten big loaders, one steam shovel, 30 flat cars, four box cars, one refrigerator car, three boarding cars, one snowplow, one gravel plow, one stock car, four cabooses, one pile driver, five steel laying cars, four larry (sic) cars, and twelve dump cars” (Salmi 1971,p.40).

The Railroad Landscape. In 1946 Ryan noted that “today only the old grades are left to remind hunters and foresters of the great timber operations once carried on. Although evidence of spurs can be found almost everywhere, pine trees twelve to fifteen inches in diameter have grown in some of the road beds, and in many only the ‘cuts’ and ‘fills’ are noticeable. Many of the early roads in northern Minnesota followed abandoned railroad spurs, and many of them are still being used as township and county roads” (Ryan 1946,p.302).

This undoubtedly was the case with the lines constructed at Voyageurs National Park by the Virginia and Rainy Lake Company. In 1971 Salmi noted that railroad grades were still evident from the "Ash River Trail to Johnson Lake and to Hoist Bay where the loading of all logs on Kabetogama and Namakan Lakes took place. Elephant Lake Trail to Elephant Lake, and branch lines to Highway 53 seven miles east of Ray, Minnesota, and to the Haney homestead west of Ray were also railroad grades" (Salmi 1971,p.15).

Trygg pointed out that because logging was done by horses, all the trails had a cover of timothy and clover hay (Trygg 8-29-75,p.15). As they were discontinued, shrub growth would have invaded, and finally trees would have begun to grow. In more permanent lines with ballast, tree growth would have been slower to come. Today, vegetation often has to be analyzed in combination with other clues to determine railroad grades, such as areas of cut and fill, the presence of ballast, or the remnants of corduroy or ties.

The historical integrity of rail lines is dependent on how well they read as corridors, their length, and the existence of material associated with railroad construction. Isolated remnants of rail lines in a heavily forested area probably are not significant. Rail corridors that retain integrity and are eligible for the National Register should be managed as historic landscape features. In other words, vegetation should be controlled to preserve the historic features. At Voyageurs National Park, portions of lines with the greatest integrity should be selected for management programs.

Waterways and Logging

The many rivers and lakes of the border country provided the only means of getting felled timber to mills in the early logging phase. With the dawn of railroad logging in the north country, timber that had been considered inaccessible came within reach, but river and lake transportation still was essential to its transport to the mills in International Falls and Virginia. A variety of devices were built in waterways to control water levels and to facilitate log drives.

Often logging companies used the summer and fall months to prepare stream beds for log drives. Some obstructions were removed with dynamite, in other cases pier dams were constructed so logs could be guided around them. Abutments sometimes were built to stabilize the banks of streams.

Dams were built to control the water level in lakes and to enable the production of water power. The dams included sluiceways, through which logs were driven, easing their journey over falls or other obstructions. At Kettle Falls (and Squirrel Falls on the Canadian side of the border) construction was begun in 1910 on the dams that remain today. The National Register nomination for the Kettle Falls Historic District included a description of the dam at Kettle Falls (also known as the International Dam), quoting Ernie Gustafson, a former employee of Mando, and later Boise Cascade, which owned and operated the dams:

The dam has four sluiceways, fourteen feet wide and each has a 6 foot wide fishway. The fishways have not operated for many years and perhaps never were effective. The piers which separate the sluices are of masonry construction, 5 feet wide with a top elevation of 1121.6 feet. The upstream face of the piers, four in number, are vertical and extend 30 feet downstream with a slight batter on the downstream face of 1 foot horizontal and 5 feet vertical. In addition, the dam has two piers bordering the fishways. The dimensions are the same as the other piers except that they extend downstream an additional 30 feet in a step pattern . . . The sluices of the dam are controlled with stop logs. The International dam has a power hoist (set on tracks) to place and remove stop logs. (Atop the American side of the dam is a wood frame gauging station measuring approximately 8 by 10 feet). The retaining walls of the International dam are about 25' and 30' long . . . The dam was repaired in the late 1940s I believe and again in 1967 and 1968. The present dimensions are the same as when first built (Hackett and Nagle 1976,p.7/1).

Smaller dams and sluiceways were built to control water on a smaller scale or to move logs over obstacles less daunting than the falls at Kettle. These devices were built of logs by the logging companies, rather than of concrete by power companies or lumber mills. According to Bryant, three types of log dams were built for logging purposes: the pier or crib dam, the rafter or self-loading dam, and the pile dam. Each type generally included a sluiceway through which the logs were run and waste water passed (Bryant 1913,p.350).

Booms were used to guide large quantities of logs to certain destinations, usually a hoist site or storage facility. Bryant described uses of booms:

Booms, consisting of long sticks of timber fastened together end for end and moored to objects on shore or to piling or cribs in the stream, are used to confine the logs to the channel. Booms are also used to aid drivers in sluicing logs through dams, for confining logs at sorting gaps and storage points, and for towing. They are built in many forms and are called sheer booms when used to confine logs for storage purposes in given channels and towing booms when used to impound logs for towing purposes (Bryant 1913,p.361).



Figure 23: *Damming a stream to raise water for floating logs, c. 1928 (Minnesota Historical Society).*

Bryant described chain booms, which seem to have been common in the border country:

Short chains are used to connect the logs, and are fastened in several different ways: (1) by a chain and dogs; (2) by a ring and toggle; (3) by a clevis, making an endless chain. The latter form is used very commonly for towing purposes and for storage areas because the booms can be readily uncoupled (Bryant 1913,p.361).

Boom rings, set in rocks, can be found in many locations at Voyageurs National Park, especially on the lower lakes (Williams 10-14-98,p.4).

The construction of storage facilities along waterways also was common. Again, Bryant provided a good description of their appearance:

On the Great Lakes, where logs are towed loose in booms, storage areas off-shore are provided in which logs are held until a sufficient number have accumulated. These areas are bounded by heavy sheer booms held in place by piling. The rafts are made up by surrounding a group of logs with heavy towing booms and towing them out of the storage areas (Bryant 1913,p.367).

Often, logs were stored along the banks of streams until the ice thawed in spring and they could be driven downstream. They may have been stored on landings, which were

temporary storage areas. It is not certain whether the landings in the border country involved any construction, or if they simply were clearings. Bryant described typical landings simply as storage areas:

Temporary storage grounds, called "landings," are made along the banks of driveable streams or on the edge of lakes where logs are to be transported by water. Their form depends on the character of the stream down which the logs are to be driven. Where the stream is small and the storage area limited, the logs are hand-decked from 15 to 30 feet high, in the stream bed, parallel to the banks. When a large volume of flood water is available in the spring, the logs may be dumped promiscuously into the stream and the floods relied upon to carry them out (Bryant 1913,p.143).

One other type of structure that was built on waterways was the trestle. At Hoist Bay a railroad trestle extended over the water, enabling logs to be hoisted from the water to train cars. In photographs it appears that the trestle at Hoist Bay was built of round timbers. Bryant described how the surface of the Hoist Bay trestle might have been built:

Caps for round timber trestles are either made from small timber hewed on opposite faces to the desired thickness or from sawed material. Stringers are usually made from sawed timber. The braces for round timber trestles are made from small poles (Bryant 1913,p.401).

To what extent remnants of structures built in waterways remain at Voyageurs National Park is unknown. Above ground resources are scarce, consequently they contribute little to the remnant historic logging landscape. Below-water remains, however, may be common, and may exist in a good state of preservation.

Integrity Requirements for Transportation Systems

Sites and structures related to logging transportation systems typically are nominated to the National Register under criteria A and C, and often under criterion D. Properties should possess most aspects of integrity, as stipulated by the National Register criteria, to be considered eligible. Suggestions regarding the application of each aspect of integrity to transportation systems and related structures follow. The definitions of the integrity aspects are taken from *National Register Bulletin 36: Guidelines for Evaluating and Registering Historical Archeological Sites and Districts*.

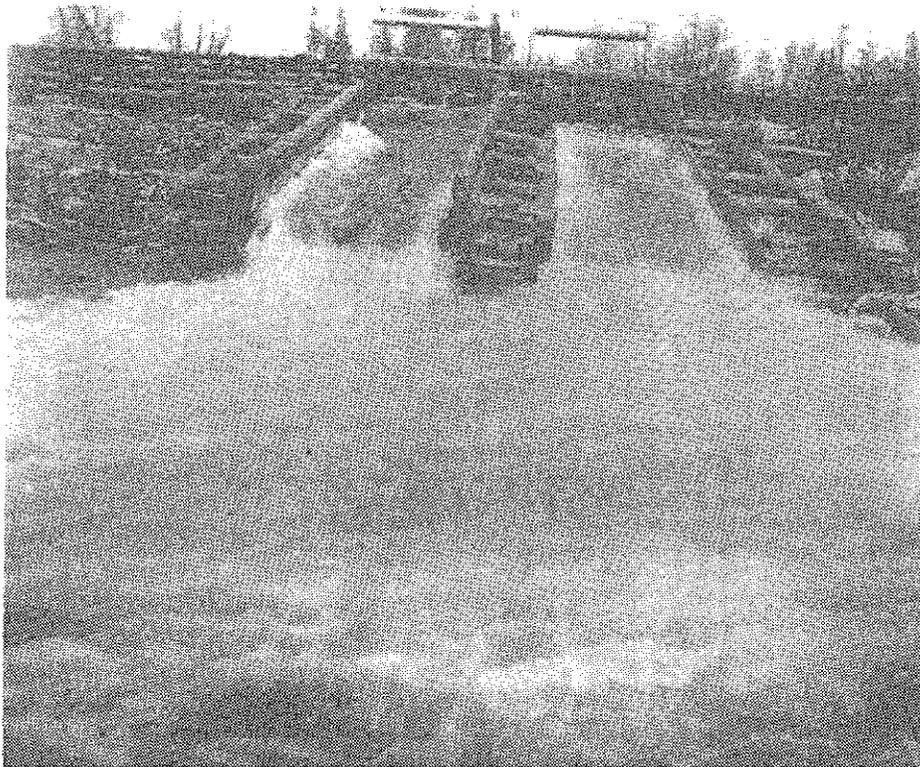


Figure 24: *J. A. Matthieu's sluice, Rainy Lake, c. 1915 (Minnesota Historical Society).*

Location. *The place where the historic property was constructed or the place where the historic event occurred.* Rail and road corridors should retain their historic locations. If a route has been moved, it is not the historic route, but a new route. If the locations of routes have been obscured by vegetation or erosion, this aspect of integrity probably has been lost. Longer intact routes have more significance than very short portions that do not easily convey a sense of the corridor.

Design. *The combination of elements that create the form, plan, space, structure, and style of a property.* The spatial relationship of corridors to the areas they served and to natural features should be evident, even if little remains of the historic fabric of the area served. For example, corridors that ran to the hoist at Hoist Bay can evidence a significant pattern, even though the hoist is gone. The profile of routes also should be intact, with the evidence of cut and fill linked to an obvious design strategy.



Figure 25: *Corridor remnant, Voyageurs National Park (B. Wyatt, 1997).*

Setting. *The physical environment of a historic property.* The setting of corridors related to the lumber industry at Voyageurs National Park generally included varied terrain, proximity to water, and vegetation—sparse or dense. *Bulletin 36, Guidelines for Evaluating and Registering Historical Archeological Sites and Districts* states that in order to convey significance, the setting must:

- appear as it did during the site’s or district’s period of significance, and
- be integral to the importance of the site or district (Townsend et al.,p.19)

Changes in vegetation associated with historic corridors probably are the result of the natural succession that occurred after logging ceased. This change in the setting must be weighed against other factors, such as the extreme erosion of features and the presence of artifacts or construction remnants.

Materials. *The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.*

The materials associated with the site may be earthen berms, ballast, remnants of ties or corduroy, metal remnants, and stone abutments for bridges, trestles, etc. Under criterion

D, the presence and quality of artifacts related to the corridor is a key to its integrity of materials.

Workmanship. *The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.* Workmanship can relate to the quality of physical remnants, either site features or artifacts.

Feeling. *A property's expression of the aesthetic or historic sense of a particular period of time.* Historic corridors possess an intangible feeling of significance if, through their setting and other aspects, a sense of the historic corridor is conveyed. The feeling of a logging corridor is conveyed by construction remnants, natural features, like vegetation and topography, a quality of remoteness, and a sense of purpose related to logging. If modern roads have been created on historic routes, obscuring historic fabric and features, the historic feeling probably has been lost.

Association. *The direct link between an important historic event or person and a historic property.* The corridor must have been directly related to the logging industry. Routes that travelled through the areas, but did not have anything to do with logging, do not possess that association.

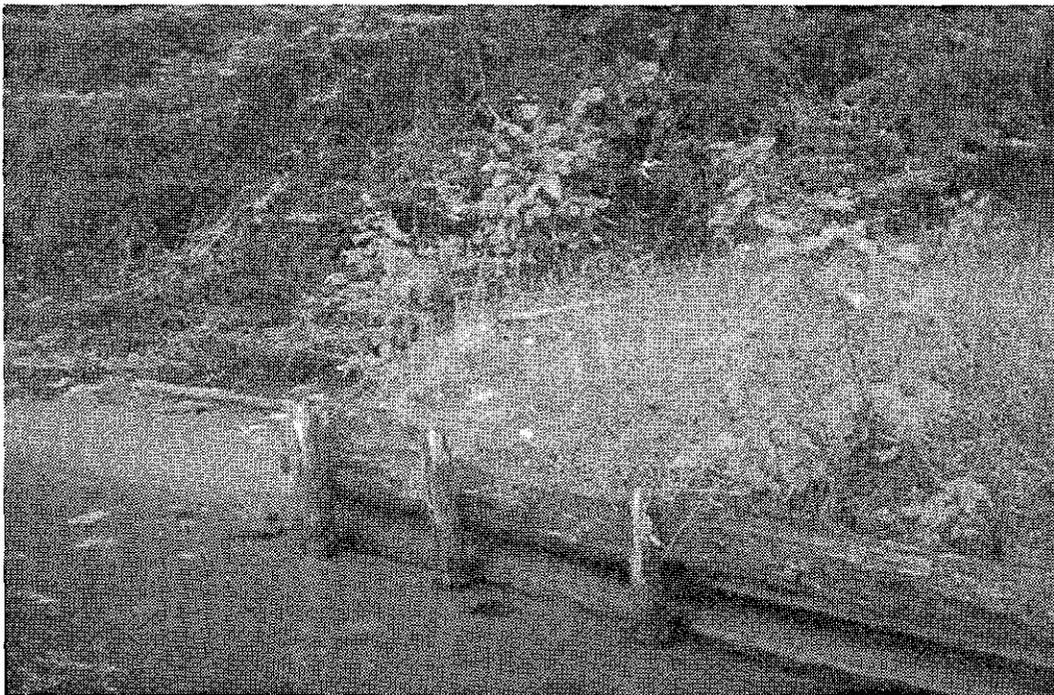


Figure 26: *Shoreline reinforcement, Namakan Lake (B. Wyatt, 1997).*

8. PROPERTY TYPE 3: RURAL HISTORIC DISTRICTS AND HISTORIC ARCHEOLOGICAL DISTRICTS

*... in a very few years the data base for logging
camps will be primarily archeological in nature.*

Jeffrey J. Richner⁸

When this project was conceived, it was assumed that rural historic districts would be an important resource type. However, as research progressed, it became apparent that this is a problematical designation for cultural resources at Voyageurs National Park. The application of this property type cannot be ruled out entirely until a complete survey of the park is undertaken; however, a more pertinent property type for extensive resources may be the historic archeological district. As the 50 year period encompasses more of Phase 3 at the park, the rural historic district concept may be more applicable. Throughout this section, integrity issues regarding both resource types are discussed.

Rural Historic Districts: Essential Qualities

Guidelines for registering rural historic districts are included in *National Register Bulletin 30, Guidelines for Identifying and Documenting Rural Historic Districts*.

Although *Bulletin 30* mostly relies on agricultural areas for its examples and explanations, the information can be interpolated for other large, non-urban areas. The bulletin does, in fact, provide some specific guidelines for non-agricultural resources.

The bulletin describes eleven characteristics that rural historic districts possess. Four concern the processes that shaped the land and seven concern the physical components of the landscape. The processes considered instrumental in shaping the land are:

1. land use and activities
2. patterns of spatial organization
3. response to the natural environment
4. cultural traditions

⁸ Jeffrey J. Richner. *An Archeological Evaluation of the Trout Point Logging Camp* (Lincoln, NE: NPS, Midwest Archeological Center, 1986) p. 11.

In regions that were logged, the physical processes are manifested in the relationship of the land to logging: how the vegetation, topography, and climate influenced the selection of areas to log and how the process of logging modified the land. For an extractive industry like logging, the presence and absence of vegetation, the quality of remaining vegetation, and the pattern of its growth may reflect logging practices—vegetation may or may not reflect the historic period. Historically, the patterns of vegetative growth (the location of resources) was critical in determining the location of development related to the industry and the progression of logging within the region.

The patterns of spatial organization were quite distinctive in logging areas. The relationship between transportation corridors, logging camps, lakes and rivers, mills, and timber resources is not random, but conveys the evolving efficiency and technology of the logging process. These patterns are entwined in the acquisition of land by logging companies, which in turn is shrouded in federal and state land laws and the interpretation, enforcement, and abuse of those laws.

Logging had a specific manifestation in the border country of Minnesota. Isolated, buried in snow and ice for nearly half the year, and comprised of more water than land, the region was logged by methods that addressed this unique constellation of circumstances. The fact that logging technology had developed to a certain point by the time the border country was reached greatly influenced the nature of logging in the area that became Voyageurs National Park.

The players in the logging empire of the far north also influenced the unfolding of the industry. Until big business made railroads and mills accessible, logging remained a limited activity. It is not surprising that Backus and Weyerhaeuser were among the biggest names in border country logging—names that were known across the country for their logging empires. Schooled in the history of logging they had helped shape—and setting its future course—the vision, drive, creativity, and single-mindedness of these men had everything to do with the rapid course and total devastation that characterized border country logging. They, in effect, created the cultural traditions of logging and implemented them until the trees they wanted were gone.

Bulletin 30 specifies the following physical components that mark rural historic districts:

1. circulation networks
2. boundary demarcations
3. vegetation related to land use
4. buildings, structures, and objects
5. clusters
6. archeological sites
7. small scale elements

The physical components of logging in Voyageurs National Park included camps and other habitation sites (such as shanties), the circulation network (sleigh haul roads, tote roads, secondary roads, railroads, portage routes) and related sites (landings, skidways, bridges, dams, trestles)—and, of course, the trees. Rural historic districts typically display the historic relationship of physical components—their significance rests in the combination of resources that convey the sense of place and the activity that occurred.

Bulletin 30 acknowledges the changing nature of the landscape and its adaptation to new conditions. It is especially accepting of changes in vegetation: “Current vegetation may differ from historic vegetation, suggesting past uses of the land” (McClelland et al.,p.5). This is especially relevant to logging sites, where distinct successional patterns can be associated with the disturbance created by logging. *However, the successional vegetation alone cannot be considered significant.* This is one of the problems in treating the logging landscape at Voyageurs National Park as a historic landscape. There is ample successional vegetation, but nothing else in a panoramic sense. Subtle patterns and disturbances are evident at a close range.

Archeological resources are acknowledged as a physical component of rural historic districts:

The sites of prehistoric or historic activities or occupation, may be marked by foundations, ruins, changes in vegetation, and surface remains. They may provide valuable information about the ways the land has been used, patterns of social history, or the methods and extent of activities such as shipping, milling lumbering or quarrying. . . The spatial distribution of features, surface disturbances, subsurface remains, patterns of soil erosion and deposition, and soil composition may also yield information about the evolution and past uses of the land (McClelland et al.,p.6).

In applying criterion D to rural historic districts, the bulletin implies that surface evidence is a critical element when evaluating archeological sites as landscapes. The evidence may be as blatant as ruins or as subtle as patterns of erosion and deposition. At Voyageurs National Park, the berms that sometimes outline the sites of log buildings can convey a sense of the logging camp. When these berm outlines are found in combination with distinct corridors that are remnants of various transportation systems, a rural historic district may be an appropriate designation. However, without clear landscape features to convey a sense of the camp in relation to the logging process, the site may be more accurately designated a historic archeological district. In other words, if the site simply appears disturbed, and if most of the cultural remains are below surface, the site may be better evaluated under criterion D as an historic archeological district. The following section from *Bulletin 30* on landscape archeology helps clarify this point.

LANDSCAPE ARCHEOLOGY

It is relatively simple to determine when a building or structure has lost its structural integrity and any potential significance lies in its value as an archeological site. More difficult, however, is deciding when to treat a landscape as an archeological site. Abandoned land, when undisturbed by later development or construction, may retain surface or subsurface features that can provide information important to an understanding of historic or prehistoric activities. When land historically cleared and cultivated is reforested, visual qualities of the historic period are lost, yet landscape characteristics, such as walls, ditches, roadways, streams, and canals, may still be in place and capable of indicating important patterns of land use or organization.

Landscape archeology may involve the examination of characteristics, such as walls, road remnants, trail ruts, foundations, and refuse sites. It may also draw information from observable patterns of erosion and vegetation. A number of techniques may be used: analysis of soil stratigraphy; analysis of pollens and other sediments through flotation and core sampling to determine planting patterns; surficial surveys to identify remnant vegetation, boundary demarcations, and evidence of land use; analyses of existing vegetation or plant succession; remote sensing to detect buried walls, foundations, and roadways; and excavation to uncover buried irrigation systems, canals, or planting beds.

Assessments of significance are based on a well-formulated research design that considers the historic contexts for the study area. The research design needs to indicate the landscape characteristics that are represented in the site and the information the site is likely to provide about the landscape characteristics that shaped an area in history or prehistory. It must explain how the information will add to an understanding of the property. The lack of other sources of information, such as written records or intact properties, generally increases the importance of an archeological site.

Linda Flint McClelland et al. *National Register Bulletin 30, Guidelines for Evaluating and Documenting Rural Historic Landscapes* (Washington, DC: National Park Service, n.d., p.19).

National Register Bulletin 36, Guidelines for Evaluating and Registering Historical Archeological Sites and Districts provides standards regarding the identification, evaluation, and registration of historic archeological districts, which are defined as “a grouping of sites, buildings, structures, or objects that are linked historically by function, theme, or physical development or aesthetically by plan. The properties within a district are usually contiguous.” The bulletin states that a survey of the entire district is not necessary “if it can be demonstrated that the area between the individual properties, although not completely surveyed, is likely to contain significant resources related to the documented properties” (Townsend et al.,p.10).

The Integrity of Historic Archeological Districts

The integrity of historic archeological districts should be assessed by the following parameters:

- Spatial patterning of surface artifacts or features that represent differential uses or activities,
- Spatial patterning of subsurface artifacts or features, or
- Lack of serious disturbances to the property’s archeological deposits (Townsend et al.,p.14).

Historic archeological districts at Voyageurs National Park would be evaluated under criterion D, which pertains to properties that have yielded, or may be likely to yield information important in prehistory or history, although, with sufficient integrity, criterion A could apply. Such sites would be associated with events that have made a significant contribution to the broad patterns of our history.

Other Logging Regions: Property Types and Integrity Issues

Because of the scarcity of associated standing structures with integrity, logging camps around the country have most commonly been evaluated as historic archeological sites under criterion D. Some above ground resources have been declared ineligible for lack of integrity. Below ground resources also have been evaluated as ineligible. In the multiple property nomination, *Railroad Logging Era Resources of the Canon de San Diego Land Grant in North-Central New Mexico*, it is stated that:

. . . the railroad grade, trestles, wyes and all other associated features have been assigned the Forest Service site number 1475. However, the physical remains of the railroad do not possess sufficient integrity to be considered significant under any of the National Register criteria (Elliott 1992,p.E-12).

In addition, the nomination states that “there are numerous reminders of the logging operations, including roads, mill waste piles, skid trails, landings, log decks and stumps. Features of this type are not normally recorded as archeological sites and are not considered significant” (Elliott 1992,p.E-12). Sites that were considered significant in this logging area include many standing structures. The nomination identifies three property types: townsite, logging camp, and isolated cabin.

The single townsite is Porter, which seems to have been very much like Cusson, Minnesota, historically. It was considered eligible under criteria A and D. The logging camps, which, like Porter, contain standing historic structures, were evaluated under criterion D and in some cases criterion C. The same was true of isolated cabins, which also were extant.

In the multiple property nomination, *Railroad Logging Sites in the Sacramento Mountains, New Mexico*, several property types were identified, including logging camps, trestles, log chutes, railroad grades, timber landings, and switchbacks. Some of these property types exhibit more above-ground remains than comparable resources display in Minnesota. All were evaluated for significance under criterion D; some also were evaluated under criterion A or C.



Figure 27: Logging camp clearing, Namakan Lake (B. Wyatt, 1997).

The nomination *Logging Railroad Resources of the Coconino and Kaibab National Forests, Arizona*, included rural historic districts as property types in logging regions. It also identified seven other property types: rolling stock, railroad grades, sawmills, logging camps, trestles, inclines, and Big Wheels. These resources are considered eligible under either criteria A, C, D, or a combination. The Rolling Stock and Big Wheels are objects.

The rural historic district has an interesting description, but does not have a great deal of relevance to northern Minnesota. It essentially is clearcut areas that retain a number of high stumps. The nomination explains:

Clear-cut areas with high stumps represent the intensive cutting practices that helped railroad logging thrive in the study area. When USDA Forest Service regulations and plans took effect following 1910, timber could no longer be harvested intensively. The practice of clear-cutting was replaced by the principle of sustained yield. New policies promoting the selective removal of timber eroded the profitability of logging railroads, and foreshadowed the replacement of railroads by trucks. Clear-cut areas with high stumps evoke memories of the golden age of railroad logging. For their strong association with the context of railroad logging, these historic sites are potentially eligible for the National Register under criterion A.

The integrity requirements are:

1. the property must not predate the era of railroad logging
2. the property must exhibit the character defining elements of a clearcut area: that is, there must be no tree regeneration within its boundaries. High stumps must be present to show that the area was not naturally open, but, rather, was cut. The property must also convey a sense of intensive tree harvesting on a large scale (Beidl 1990,p.F-15).

Subsequent to the approval of this nomination (2-24-95), the nomination *Barney Flat Historic Railroad Logging Landscape* was nominated to the National Register under criterion A. The nomination demonstrates that Barney Flats does meet the above criteria for a logging landscape (rural historic district). The nomination form describes its integrity as follows:

Barney Flat Historic Logging Landscape conveys in a dramatic way the effects of turn-of-the-century railroad logging practices. . . With the lack of regeneration here, one can almost imagine having arrived on the scene soon after the last log was loaded on the train (Stein 1995,p.7-3).

Regarding the rail corridor, it states:

The remains of the Saginaw Southern Railroad (the contributing structure) found here directly associate the site with railroad logging. Although the rails were removed upon abandonment in 1904, many of the ties are still in place or near their original location. Where ties are missing, the raised earthen berm reveals the alignment. . . (Stein 1995,p.7-2).

Potential Rural Historic Districts at Voyageurs National Park

The challenges of identifying rural historic districts at Voyageurs National Park include the absence of above-ground structures, the encroachment of forests on resources, and a lack of sub-surface integrity. This last condition may be true only of some Virginia and Rainy Lake Company camp sites because of the concerted effort by the company and the State Forest Service to eliminate the camps, even by dynamiting them.

In theory, the most comprehensive rural historic districts at Voyageurs National Park would show the relationships that existed between logging activities. Thus, a rural historic district would include a logging camp, a network of transportation corridors, and vegetation that is characteristic of areas disturbed by logging. It might include evidence of hoists, dams, and skidways that convey the importance of log drives. These resources could be remnants or ruins, but they must be recognizable as a specific resource and together they must convey the interrelationship of the parts. Surveyors who find such sites should evaluate them according to the integrity standards in *Bulletin 30*.

Transportation corridors and camps exhibit the most integrity when they are clear of vegetation, especially trees. As trees encroach on the remnants of these resources, not only are they obscured, but tree roots eventually can modify the integrity of berms and railroad grades. Thus, serious consideration should be given to vegetation management strategies that preserve the integrity of such historic resources. Some resources that are deemed ineligible may have considerable interpretive value.

A potential historic resource—possibly a rural historic district—are remnants of old-growth forests that include white pines. Because these trees were so completely removed, except perhaps in some remote areas that were not logged, any that remain would be of extreme historic significance. When a thorough survey of the park is undertaken, this resource, if it exists, should be evaluated for its eligibility. These sites should be managed to preserve and regenerate significant vegetation.

APPENDICES

APPENDIX 1: THE CHANGING FORESTS AT VOYAGEURS NATIONAL PARK

The forests that remain at Voyageurs National Park are not testaments to the trees the lumberjacks saw but, instead, they tell the story of the aftermath of the intensive logging that took place in the first three decades of the twentieth century. Forests of the border country were an ecosystem in upheaval during the heyday of logging, and they probably will never again look as they did when federal surveyors traipsed through, noting their composition as a prelude to the disposition of the land and eventual pillaging of the trees. O'Meara described the landscape as the region was being logged as follows:

It was a country scarred by glaciers, blackened by fire, desolated by the cutting tools of men. And the earth, as though to cover the shame of her mutilation, had thrown a veil of silvery birch and poplar saplings over the scene. No pine, neither the dark white pine nor the clean red Norway, would ever grow here again (O'Meara 1947,p.41-42).

Today, only a few small pockets of old growth pine remain, and few clearings remain as evidence of clearcutting that took place earlier in the century. Instead, forests of aspen, spruce, and fir dominate.

Pre-Settlement Vegetation at Voyageurs National Park

The pre-settlement vegetation of northern Minnesota can be ascertained from various early sources. In the 1880s and 1890s, the Voyageurs National Park region was surveyed by the General Land Office as part of the federal survey program. In the process of marking town and range lines, the surveyors noted various natural features, including vegetation. Although the federal surveys were not always accurate, the overall categories of plant communities described by the surveyors probably reflect the communities that occurred in the Voyageurs area. The information they recorded has been helpful in reconstructing pre-settlement vegetation.

Between 1872 and 1885 the federal government conducted the Geological and Natural History Survey in Minnesota. Working for the Geological and Natural Survey in Minnesota, H. B. Ayers described northern Minnesota's forests in his 1901 report *Timber Conditions of the Pine Region of Minnesota*. Timber cruisers also noted vegetation in

some detail. Around the turn of the century several cruisers were sent to the border country to investigate its logging potential.

When the wealth of the region became a glimmer in the eyes of E. W. Backus, he sent Lyman W. Ayer to the four northern counties to inspect the timber for the Backus-Brooks Lumber Company. The report he submitted at the conclusion of his 1902 - 1903 trip described the forests embraced by and surrounding Voyageurs National Park.

As we go West, the average quantity of Spruce per acre increases. In St. Louis County, we find a large amount of spruce especially in the Northern part. This county is particularly well watered there being a great number of lakes, rivers, and small streams, all affording a sure and cheap mode of transportation for the Spruce from the stump to the mill. There are some very heavily timbered townships of Spruce in St. Louis County and there is at the present time, quite a large amount of Spruce being put in (illegible word) along the line of the Duluth, Virginia and Winnipeg Roads and on the Iron Range road. South of your territory (illegible word) St. Louis County is not so generally grown to Spruce as in Itasca and Beltrami Counties.

The division line between St. Louis and Itasca Counties is the Range Line between Ranges 21 and 22. Easing west from this line, we now come to some of the better Spruce territory. The Northern half of the two great counties of Itasca and Beltrami are practically one great Spruce Swamp, all of which contains, more or less, Spruce of useful size (Ayer 1904,p.162).

Taken together, the General Land Office surveys, the Geological and Natural History Survey, and the timber cruisers' reports present a picture of pre-settlement vegetation in northern Minnesota. They are most useful in providing an overview of vegetation types, rather than a compendium of highly accurate, site-specific information. Of particular concern regarding site-specific information was the fraud and inaccuracy that is known to have permeated the federal survey process.

In 1930 Francis J. Marschner compiled a map of *The Original Vegetation of Minnesota* based, in part, on the sources described above. Miron Heinselman, who wrote an explanation of Marschner's map on the published version, stated that Marschner's map "for most areas . . . is a remarkably good generalization of factual conditions" (Heinselman 1974,n.p.).

The Kabetogama peninsula was described by Marschner as containing three main communities: Jack Pine Barrens and Openings covered the greatest land area, white and

Norway pine were moderately represented, and the Aspen-Birch Community covered the least area. At the far western end of the peninsula, Marschner delineated an area of wet prairies, marshes, and sloughs. South of Rainy Lake, west/northwest of Sand Point Lake, and south of Namakan and Kabetogama lakes, the vegetation was similar to that on the peninsula, but with fewer Jack Pine Barrens and more areas of white and Norway pine.

Heinselmann noted the following about these communities:

There is much evidence that the pine forests of northern Minnesota were maintained by periodic fires. In fact, the whole forest ecosystem of the conifer region required periodic perturbations by fire to maintain its diversity, productivity, and stability. For example, the abundant ASPEN-BIRCH (Conifer) types and the JACK PINE BARRENS AND OPENINGS of Marschner were clearly products of recent or repeated fires or both. Most old pine groves were scarred by frequent surface fires that kept them in a park-like condition and often created openings large enough for regeneration to occur (Heinselmann 1974,n.p.).

The white pine and Norway pine groves mapped by Marschner were mature stands of old-growth pine forests. The understory of these forests may have been balsam fir, black spruce, and northern white-cedar. According to Heinselmann, "occasional large specimens of white spruce are co-dominant with the pines" (Heinselmann 1974,n.p.). The composition of the understory and its density would have been dependent on the fire history of a stand. Regarding the oldest stands, Heinselmann stated, "Most extant virgin stands tend to be even-aged in groups or groves, with scattered individuals or groups of older trees intermingled or nearby—a structure clearly traceable to past fires" (Heinselmann 1974,n.p.).

The Jack Pine Barrens and Openings mapped by Marschner occurred in northern Minnesota on the "thin rock-outcrop soils of the Laurentian Shield" (Heinselmann 1974,n.p.). Fire was necessary to open the cone some places in Minnesota, and it also created the open spaces necessary for regeneration (Heinselmann 1974,n.p.). The Jack Pine groves were, in some places, interspersed with "nearly treeless heaths or open, lichen-covered, rock outcrops" (Heinselmann 1974,n.p.). These probably are at higher elevations. The understory of older stands would have been balsam fir, black and white spruce, and northern white-cedar. Where jack pines grew in association with black spruce, the ground

layer may have been dominated by moss—perhaps, *Pleurozium schreberi* (Heinselman 1974,n.p.).

The Aspen-Birch community is a successional community that occurred after fires and, later, after logging. It is comprised of quaking aspen, bigtooth aspen, and paper birch. Pines, in some cases, were a co-dominant. The wetlands delineated on the west end of the Kabetogama Peninsula by Marschner may have been peatlands, wild rice areas, or seasonally inundated grasslands (Heinselman 1974,n.p.).

Since Marschner prepared his map, others have classified the original vegetation at Voyageurs National Park. In 1964 A. W. Küchler published *Potential Natural Vegetation of the Conterminous United States* (American Geographic Society, Special Publication 36), showing climax vegetation rather than seral (temporary) types (Heinselman 1974,n.p.). In the report *The Fire and Logging History of Voyageur's National Park*, Coffman, Rakestraw, and Ferris included a map of Minnesota's original vegetation, which was not a map of climax types (Coffman et al. 1980,p.24). They cite the use of General Land Office Survey notes.

Coffman et al. identified five types of ecosystems at the park, some of which present conditions that are not ideal for pine growth. Thus, the landscape never appeared uniform, but reflected the gamut of successional stages associated with the several types of forests and the devastation that was common even before logging. Heinselman described the phenomenon as follows:

. . . the vegetation as a whole was relatively stable, but the details of the mosaic shifted like pieces in a kaleidoscope. . . the natural vegetation was in a constant state of flux due to gradual plant migrations caused by climatic changes, local successional changes initiated by fires, windstorms, or insect and plant disease outbreaks, and the gradual modification of wetlands by bog and swamp forming processes. Fires created the most dramatic, widespread, and significant short-term vegetation changes. Lightning was a frequent source of ignitions, in both prairie and forest, but ignitions by Indians, fur-traders, and explorers must also have been extremely common (Heinselman 1974,n.p.).

The following chart (Figure 28) has been prepared from information in the 1980 report by Coffman et al. They noted that most logging evidence (stumps) was found on site types 2, 3, and 4 and that 65% of the entire park showed evidence of logging (Coffman et al. 1980,p.45-46).

FOREST SITE TYPES AT VOYAGEURS NATIONAL PARK

Site Type	Average Soil Depth	Soil Texture	Dominant Vegetation
1	3.8 inches dry ridges	thin, loamy sands over bedrock	pre-logging: jack pine 1980: jack pine, Norway pine
2	5.24 inches	fine sands – sandy loams; low in moisture and nutrients	pre-logging: pine, spruce, fir 1980: aspen, spruce, fir
3	15.71 inches	silt loams – clay loams; optimum conditions of moisture, nutrients, and drainage	pre-logging: white and red pine 1980: aspen
4	15.22 inches	loamy clays to clays; more clay than type 3	pre-logging: spruce, fir, pine 1980: aspen, spruce, fir
5	32.22 inches swamps	mostly organic peat - deep, poorly drained organic soils	pre-logging: spruce, fir, tamarack, cedar 1980: same

Figure 28: *Forest Site Types at Voyageurs National Park.* This chart compares the vegetation before extensive logging activity with vegetation existing in 1980. From *The Fire and Logging History of Voyageurs National Park*, by Michael S. Coffman, Lawrence Rakestraw, and James Ferris (Michigan Technological University, 1980).

Recent Land Cover

It is clear that a pure canopy of pine forests never stretched across Voyageurs National Park. The accompanying chart, *Changing Landscapes, Voyageurs National Park* (Figure 29), which was prepared by park staff, shows the varied composition of forests over time, and compares the presettlement vegetation with that in 1973 and 1988. It indicates a great reduction in Norway, white, and jack pines (47.5% less), and a tremendous increase in aspen (24.3% more).

Throughout this report, the common names for plants refer to the following species:

<i>Abies balsamea</i>	balsam fir
<i>Betula papyrifera</i>	paper birch
<i>Picea glauca</i>	white spruce
<i>Picea mariana</i>	black spruce
<i>Pinus banksiana</i>	jack pine
<i>Pinus resinosa</i>	red or Norway pine
<i>Pinus strobus</i>	white pine
<i>Populus grandidentata</i>	bigtooth aspen
<i>Populus tremuloides</i>	quaking aspen
<i>Thuja occidentalis</i>	northern white-cedar

Barbara Wyatt, 1999

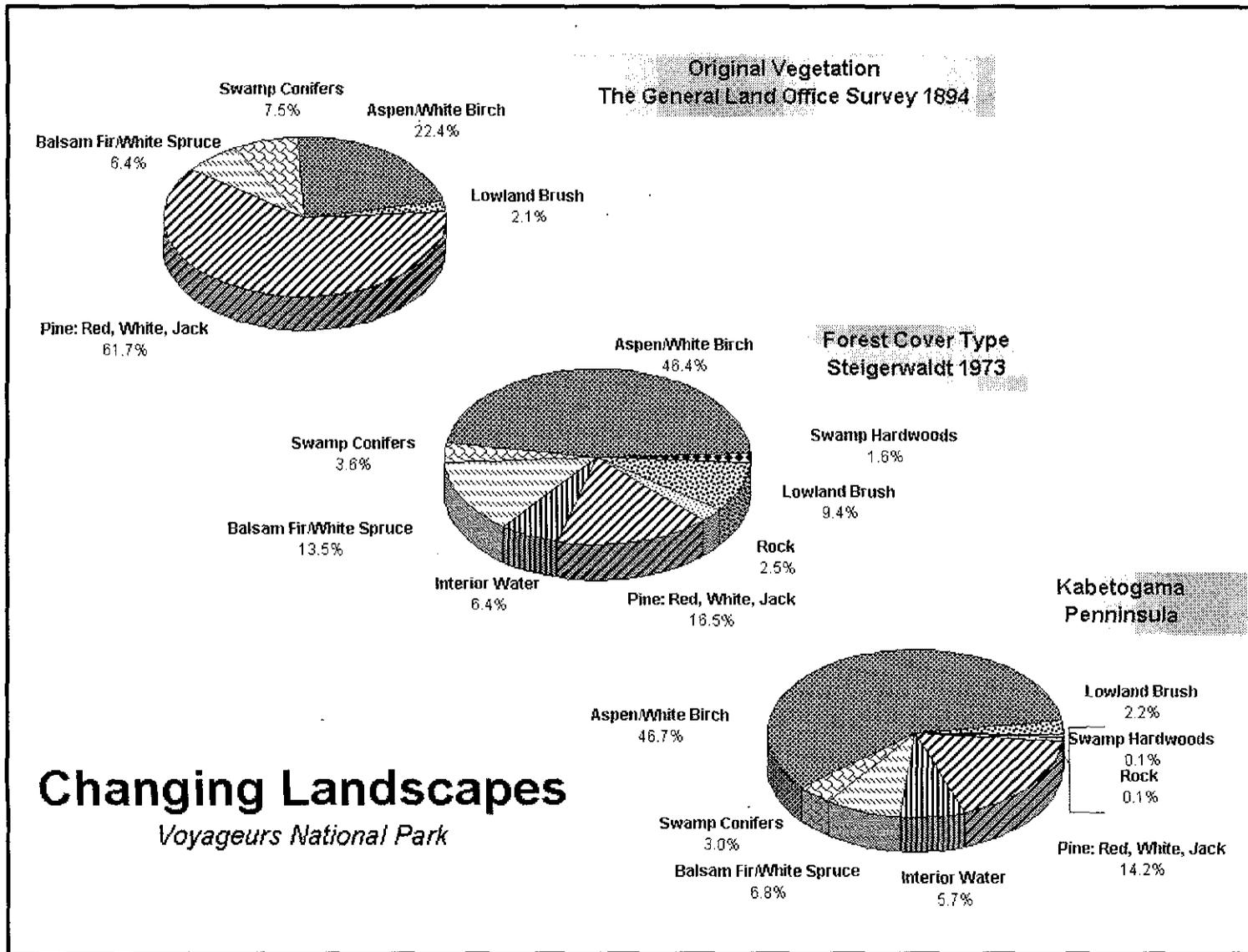


Figure 29: A comparison of vegetation in 1894, 1973, and 1988 (Voyageurs National Park, n.d.).

APPENDIX 2: THE ACQUISITION OF TIMBER LANDS IN MINNESOTA

I have often said that I know of no legislation in history that caused more widespread massive voluntary suffering than did the quest for land under the various homestead acts, and this research has convinced me of that fact even more.

Hiram M. Drache, 1983⁹

The story of land distribution in the United States is complex, and Minnesota is a microcosm of that complexity. The multitude of federal and state laws that influenced the distribution of land, and the subsequent corruption and abuse of the land laws, had a tremendous impact on the progression of logging in the border country and the method by which timber resources got to market. This chapter presents some of the major legislation that affected the dispersion of land in Minnesota—the subject is so complex that much more could be written. The works cited as references should be consulted for more detail.

Early in the distribution of Minnesota land, federal and state laws treated the state's timber lands no differently than those areas intended for agricultural use. Furthermore, the timber lands were located in areas that were late to be surveyed—a condition of land sales until 1854. A lucrative market for Minnesota's timber existed before laws and surveys had caught up with it, and there was little to stop its exploitation.

Land policies until as late as 1890 were incredibly insensitive to the value of forest resources, the limitations of the nation's forests, and their vulnerability in the face of settlement and the forest industry. Because timber on publicly owned lands could not legally be cut by settlers in the vast land west of the Missouri River, it was simply stolen (Clepper 1971,p.22).

A review of the legislation that affected land distribution and an examination of actual practices will help explain how land in the border country went in and out of the public domain, and how logging companies obtained land. Federal and state laws also help

⁹ Hiram M. Drache. *Koochiching*. (Danville, IL: The Interstate Printers and Publishers, Inc., 1983), p.x.

explain, in part, why logging changed after the Virginia and Rainy Lake Company ceased operating and the advent of the Great Depression.

Distribution of Land in Minnesota by the Federal Government

The land now contained within the boundaries of Minnesota was claimed by France and England before the United States took possession. Following the 1783 treaty that ended the Revolutionary War, the region east of present Lake of the Woods became part of the United States. With the Louisiana Purchase of 1803, the area of Minnesota from Lake of the Woods westward became part of the United States, with the northern boundary established at the 49th parallel. The boundary between the United States and Canada between Lake of the Woods and Lake Superior was the subject of international negotiation from establishment of the Joint Commission in 1814 until the issue was finally resolved in 1931.

The area that became Minnesota was claimed by Virginia when it was first acquired by the United States. In 1784 the United States was ceded much of this northwestern land claimed by Virginia, in exchange for military bounty lands (mostly in Ohio). Despite the recognition of U.S. ownership, British posts remained south of the Canadian border until 1796—with the Northwest Company flying “British colors over its trading posts in Minnesota for another twenty years” (Dana et al.1960, p.67).

Settlement in Minnesota did not occur to any great extent for many years. Besides the remoteness of the region, Indians still had a right of occupancy, which was gradually extinguished by various treaties, agreements, and acts of Congress (Dana et al. 1960,p.67,70). Jenks Cameron, in his book *The Development of Governmental Forest Control in the United States*, wrote that westward settlement by non-Native Americans “was bound in the course of its glacierly, irresistible progress to ride down certain things which lay in its path. The Indian was one, the buffalo another, timber, a third” (Dana et al. 1960,p.71). Minnesota lands were ceded by Indians beginning in 1805 and continuing to 1889, by which time a number of reservations consolidated Native American ownership of land.

The ceding of lands by Indians and the establishment of reservations is a complex chapter of Minnesota history that is fraught with anguish. An important element of the

story was the tremendous pressure to facilitate logging by curtailing the Indian presence. The region that includes Voyageurs National Park was ceded by the Bois Fort Band of Chippewas in 1866 (Dana et al. 1960,p.81). Both the Nett Lake and Deer Creek reservations were established by the agreement, although the latter was later opened to settlement.

The earliest settlers to Minnesota gravitated to the Red River Valley near Pembina and near the confluence of the Minnesota and Mississippi rivers in the southeastern part of the state. Settlement was stimulated when the Minnesota Territory was created by passage of the Organic Act of March 3, 1849, and again in 1854 with passage of the Preemption Act, which legalized entry to unsurveyed lands (see below). Little had been done to stem the tide of squatters and timber poachers who could not wait for surveys to be undertaken to pour into the rich land that lay between the St. Croix and Mississippi rivers. Until the Preemption Act was repealed in 1891, the legal entry onto unsurveyed lands was a great benefit in the timber lands in the north—even though other aspects of the law were flagrantly abused.

Until 1841, early land sales in Minnesota were carried out according to the Act of 1820. Known as the Cash-Purchase Act of 1820, the law offered public land for sale for a minimum of \$1.25 an acre, with a minimum farm size of 80 acres. Land was sold at auction when the president proclaimed it was for sale; presidential proclamations were issued through the General Land Office and advertised three to six months before the opening of the sale. Each auction was kept open for two weeks. Unsold land was kept on the market indefinitely at the minimum price (Hibbard 1965,p.105-107). The purpose of selling land at auction was to raise money for the federal government. In Hibbard's words, "the public domain was viewed as a source of revenue" (Hibbard 1965,p.107). In practice, sales only minimally exceeded the minimum price and promoted speculation.

The Preemption and Homestead Acts

The Preemption Act of 1841 modified the cash sales system. It was intended to deter speculation and promote the sale of small tracts to serious farmers. This act gave to American citizens (or aliens with the intent of becoming citizens), who were the head of a family, a widow, or a male over age 21, the right to settle on 160 acres and subsequently

buy the land for the minimum government price (Hibbard 1965,p.158). Land could only be preempted by those who owned less than 320 acres elsewhere in the United States. Popularly known as the "Log Cabin Bill," when the Preemption Law was enacted it simply legalized squatting, a widely practiced means of obtaining land. The law had unpopular aspects, most notably the requirement for surveys to precede preemption. It also was subject to corruption. Land could be held off the market by people who had claims, only to sell the relinquishment (profiting by the increase in value that may have occurred). Such speculation was exactly what Congress had hoped to prevent. In 1853 and 1854 legislation was passed to allow preemption of unsurveyed lands. The 1854 legislation allowed preemption of the unsurveyed lands in Minnesota (Dana et al., p.79).

The Homestead Act was signed into law by Abraham Lincoln on 20 May 1862. This act allowed settlers to claim 160 acres of free land (except for a small filing fee). They could obtain title to the land after living on the acreage for five years and making certain minimal improvements (Hibbard 1965,p.385). Like the Preemption Law, the Homestead Law was based on the principle that the United States frontier should become a landscape of small farms. The law allowed for the commutation of homesteads, that is the ability to pay from \$1.25 to \$2.50 an acre if the preemption requirements were met. In practice, the commutation privilege was much abused. Claims were filed by people who had no intention of farming the land. The General Land Office was aware of the abuses and reported that commuted lands became "part of some large timber holding or a parcel of a cattle or sheep ranch" and "generally these lands are sold immediately after final proof" (Hibbard 1965,p.389).

The Homestead Law, which virtually replaced the cash sales system, gave evidence of a major shift in attitude toward public land: rather than a source of revenue, land was viewed as a means of promoting settlement, stimulating internal improvements, and boosting individual prosperity. The act was intended to limit land auctions to special tracts and limit cash sales to preemption and certain other parcels of land. According to Hibbard, the Preemption Act should have been repealed when the Homestead Act was passed (Hibbard 1965,p.112), but the legislation was not forthcoming until 1891 when

land auctions were virtually eliminated. (Cash sales, however, continued for many years through land conveyed under the Timber and Stone Act and commuted homesteads.)

Beginning with the end of the Revolutionary War, land allotments were used by the federal government as a means of encouraging settlement. Richard R. Bailey, a pioneer in the lumber industry in Minnesota, offered the following explanation of so-called "script" in an interview with J. William Trygg:

A lot of homesteaders homesteaded a good deal of that land (northern Minnesota), which was sold to the loggers. And then you could use script; a lot of this timber was script, and some railroad grants in there. . . when the soldiers in the Civil War quit the Civil War he was given so many acres of script, and he could cut that on any vacant land in the United States no matter where it was. He could keep that script in his pocket, and any time he got what he thought he wanted for it he could sell it. I know script was worth about \$2.50 an acre. He probably got 300 or 400 acres of script when he quit the Civil War. That's one kind of script. When the Iron Range Railroad, for instance, and other railroads were built up in this country, the government sponsored them and said we'll give you so many million acres of land, odd sections, we'll give you your pick of odd sections of land along your railroad as an incentive to build it. Then the railroads came in and selected this land, public domain land, applied this script, and that gave them title to the land. Afterwards they sold it (Bailey 1-9-53,p.9).

Other Laws Affecting Land Distribution in the Border Country

In addition to the preemption and homestead acts, a spate of legislation was passed in the nineteenth and twentieth centuries to address the disposition of federal land, the abuses of the land distribution programs, conservation of soil, forests, minerals, and water, and the retention in the public domain of land for conservation and recreation purposes. Some of these laws transferred land from the federal to the state government, and the state developed means for selling the land or its resources, or established programs for keeping land in state ownership. Some federal and state land laws had more bearing on land in northern Minnesota than others. Those with the greatest impact on the disposition of public land in the border country and the logging industry will be discussed in this section.

The State of Minnesota received 2,900,000 acres of land from the federal government by virtue of the provision in the Organic Act of 3 March 1849 that conveyed sections 16 and 36 in each township to the state for the use of schools. These lands actually became available in 1857 (Dana et al. 1960,p.92,133). The state passed legislation specifying that

the income from the sale or lease of school lands would be used to establish a perpetual school fund that would be distributed according to the number of students in an area. In 1862 the State Land Office was established to dispose of the lands. The office was headed by the State Land Commissioner, who also was the State Auditor. School lands could not be sold in tracts of more than 160 acres. Dana, Allison and Cunningham related how the school lands were treated in the timber belt:

In 1863 the Land Commissioner was authorized to sell pine stumpage on school lands at not less than a minimum price to be fixed by the surveyor general of logs and lumber. This procedure was made obligatory in 1877, with the proviso that sales could be made when, and only when, the timber was "liable to waste." This restriction had little practical effect, since virtually all timber in the northern part of the state was liable to waste because of the ever-present danger of fire (Dana et al. 1960,p.134).

Later legislation was passed in an attempt to better control land and timber sales of school lands, with the intended result of yielding the maximum profit to the state. In 1885 a law was passed that stumpage could be sold only by the approval of a "majority of a board consisting of the Governor, the State Treasurer, and the State Land Commissioner" (Dana et al. 1960,p.134). The term "stumpage" is used to describe standing timber, which is suitable for cutting and milling into lumber.

After the timber was sold, the land was to be appraised and sold for not less than \$5.00 per acre. As was true of almost every piece of federal and state land legislation, violations of laws affecting school lands was common. Dana et al. stated the following:

Nevertheless the state continued to suffer from the ingenuity of timber operators and the venality of public officials, which were particularly widespread and notorious in connection with the school lands. The situation finally became so malodorous that in 1893 the legislature appointed a Pine Land Investigating Committee "to inquire into any and all frauds that have been committed at any time in any part of the state by which the public lands owned by the state. . . have been despoiled of their timber by open robbery and under-valuation of their value, or by any other means" (Dana et al. 1960,p.134-135).

The Timber and Stone Act of 3 June 1878 (which did not become effective in Minnesota until 1892) was an effort to distribute land not suitable for agriculture, but valuable for its timber or stone (but not mineral land). Surveyed land that had not been offered for sale could be sold for a minimum of \$2.50 an acre. Those who would attest

that they only would be using the land for their own use could purchase 160 acres under the act. Until 1908 land sold under the law went for \$2.50 an acre, but after 1908 it was sold at its appraised value. Like the other federal land laws, the Timber and Stone Act was abused. To obtain timber, purchases were arranged by the big timber companies through individual purchasers. The law was not repealed until 1955, with a total of 1,409,215 acres (3% of all federal grants and sales in the state) sold under the law (Dana et al. 1960, pp.105-106).

In 1864 the Northern Pacific Railroad Company received nearly two million acres of land in Minnesota by federal legislation (Dana et al. 1960, p.110). The railroad received alternate, odd-numbered sections, twenty miles each on both sides of the road. Land still possessed by the railroad five years after completion of road construction was to be sold for not more than \$2.50 an acre (Dana et al. 1960,p.109).

Another venue for a federal land grant to the state was the Swamplands Act of 1849, amended in 1860 to encompass Minnesota. Land was designated swampland in Minnesota according to the original public survey notes. Close to five million acres were conveyed to Minnesota under the act (Dana et al. 1960,p.59). Of this, more than three million acres were given for specific developments, even though the act specified that proceeds from the sale of swamplands were to be used to drain the swamps. Much of the swampland was granted to railroad companies, and other grants were given for the construction of a variety of public institutions (Dana et al. 1960,p.148). In 1881 the state began selling the land, as it had the school lands. According to Dana et al., "receipts were placed in a permanent trust fund, the proceeds from which were to be apportioned one-half to the common school fund and one-half to the state's educational institutions in the relative ratio of the cost of support of such institutions" (Dana et al. 1960,p.149). More than 300,000 acres of swamplands were sold by the state. Because the state reserved rights to the timber and minerals on swamplands, it made much more on the land than was anticipated (Dana et al. 1960,p.150).

The Swamplands Act also was subject to abuse in Minnesota. Because the original survey data were used to classify swampland, "many tracts of valuable land that were neither swampy nor subject to overflow had been patented to the state" (Dana et al.

1960,p.99). In fact, the General Land Office inspections “showed that most of the surveys in the Duluth land district subsequent to 1880 were fraudulent and unreliable” (Dana et al. 1960,p.99).

A series of acts was passed by Congress in subsequent years to relieve the burden posed by crop failures, droughts, fires, etc. Minnesotans (as well as Wisconsin and Michigan settlers) were helped after extensive forest fires in 1894. Settlers in the burned areas were allowed two extra years “for making final proof, or they or their heirs could receive title to the land by paying the minimum price, providing the law had been complied with up to the date of the fire. Furthermore, if they had not lived upon the land long enough to commute, and had lost 75,000 feet of merchantable green timber, they could obtain permission to cut the burned timber and receive a patent to their claim upon payment of \$1.25 per acre” (Hibbard 1965,p.404).

Abuse of the Homestead and Preemption Laws

The Preemption and Homestead acts were intended to aid the settlement of agricultural land. By the late 1870s there were serious concerns regarding the fraudulent application of the laws to lands primarily valuable for timber or minerals or water rights. These claims were not being filed for “the purpose of residence and improvement by the professed preemptor” (Hibbard 1965,p.169). In the nation’s forested land, including Minnesota, compliance with the Homestead Law was so difficult that abuse was rampant. Until 1891 when it was repealed, the Preemption Law was used to obtain land for \$1.25 per acre. The commutation clause of the Homestead Act was used in the same way until the Timber and Stone Act was passed in 1878 and 1892; its provisions were extended to all public land states, including Minnesota (Hibbard 1965, p.465). Little attempt was made to hide the fraudulent application of the Homestead Law. Often, there was no effort to build houses, or some symbolic representation of a house was placed on the land (Hibbard 1965,p.390). Hibbard’s analysis of the merits of the Homestead Law was, in part:

. . . so far as the operation of the Homestead Act in relation to forests is concerned there is hardly a mitigating feature. It was wholly inapplicable, yet it applied. It promoted perjury and profits among a large number of small adventurers. The forests were early procured by the lumbermen and are now largely gone. In this tragedy the Homestead Act was a mere incident (Hibbard 1965,p.409).

The Homestead Act was widely used in Minnesota. By 1957, a total 11,390,000 acres of land had been patented under the act (final and commuted). As Dana noted, "this figure considerably exceeds that of disposals by any other method" (Dana et al. 1960,pp.104-05).

The Preemption Law was repealed by the Land Act of 1891, which also repealed the Timber Culture Act of 1873. The 1891 legislation also disallowed commutation under the Homestead Act of 1862 until 14 months after filing and disallowed the sale of public lands by auction. It empowered the president to set aside public lands covered with timber or undergrowth as forest reserves (Dana et al. 1960,p.398).

With passage of the Land Act of 1891, those who wanted large tracts of land were at a disadvantage. The only land available for purchase was preemption claims not completed but established prior to 1891 and homestead commutations. Where preemption and cash sales by auctions had favored the needs of timber companies, which needed large tracts of land to thrive, the federal government's efforts to foster land ownership by small farmers presented an obstacle.

Homesteading proved to be an extremely useful tool for timber companies, although only serious corruption of both the letter and spirit of the law made it workable for them. Because it was intended for agricultural land, the homestead law had been relatively little used in the Duluth Land Office before 1890. Most of the land, after all, was rocky with soil more suited to forest growth than crops. The effect was that the amount of acreage claimed under the Homestead Act soared, but only a fraction of the claims were finally entered after the five year period (Larson 1949,p.282-283). Larson stated the following about the situation:

Such discrepancies between original and final homestead were characteristic of the whole period of homesteading in the pineland area. Many of the homesteaders came into possession of the "claims" quite soon after the original homestead application had been filed by the method of commutation. This method, though in use before, had been changed somewhat in 1891 so that an individual could become owner of his claim through purchase at \$1.25 an acre fourteen months after he had made his original application. Commutation increased in northern Minnesota as pinelands and iron-ore lands grew in demand. In 1890 individuals became owners of 9559 acres by way of commutation; in 1891 of 15,920 acres; in 1892, 18,645; and in 1893, 22,790. In 1902 commutation placed 27,782 acres in private hands; in the following year, 28,322 acres. . . . That timberlands were more generally commuted than lands in the agricultural sections of Minnesota was

generally acknowledged. In the period from July 1, 1899, to June 30, 1903, there were 1865 commuted homesteads in Minnesota and of these 1485 lay in the timber belt of the state (Larson 1949,p.284).

Dana et al. also described the abuses of the Preemption and Homestead acts:

Widespread use was made of the preemption act and the homestead act for an illegal purpose—to obtain title to land primarily valuable for lumbering and mining rather than for agriculture. Individuals would enter a quarter section, either on their own initiative or more often as agents of a speculator, a lumber company, or a mining company; would make a pretense of settlement for the required period; and after obtaining a patent on payment of \$1.25 per acre would transfer the title. Sometimes the ostensible “settler’s” residence on the tract was not only fictitious, but he did not even know his name was being used. The Public Lands Commission reported in 1904 that between 1885 and 1890 a large lumber company obtained thousands of acres of pine land in Minnesota by filing preemption claims in the names of persons listed in St. Paul and Chicago directories. At the appropriate time, one set of men would make proof on all of the claims before the local land officers, with whom there was a standing agreement to permit this kind of proof for a consideration of \$25.00 per claim (Dana et al. 1960,p.102-103).

According to Dana et al., the commutation provision of the Homestead Act was used to obtain timber and mineral lands illegally. After six months (prior to 1891) and after 14 months (after 1891), title to land could be purchased by paying \$1.25 an acre. Dana et al. stated about the abuse of the law in Minnesota:

The Public Lands Commission found that during the period from July 1, 1899, to June 30, 1903, commuted homestead entries in Minnesota comprised 27 per cent of the final entries. Nearly nine-tenths of the commuted entries were in the timber and mineral belts.

. . . The Amount received by the government for the land and timber in the commuted entries in the timber belt was \$151,307, as against an estimated value for the stumpage alone of \$891,000 — not a bad bargain for someone. County records showed that 89.4 per cent of these lands (or of the timber on them) had been sold for approximately \$327,000. If the 10.6 per cent of the total area remaining unsold had the same average value as that sold, the entrymen made a cash profit of about \$76,000 and still had about \$94,000 invested in land, while the purchasers made a net profit of about \$470,000.

The Commission found that within three years after proof almost every sign of habitation and cultivation had disappeared on commuted claims in the timber and mineral belts, and that in townships where commutation had been heaviest no inhabitant was to be found save an occasional trapper or hunter. Several houses examined had no floors or roofs except “rafters,” and all contained a number of

large stumps cut from two to three feet high. These shacks were on commuted entries which had been transferred to a well-known lumber company on date of proof. A gesture toward compliance with the law, not unknown elsewhere than in Minnesota, was for the commuter to place an ordinary dry-goods box on his claim, and on the date of proof to swear to the existence on the claim of a good board house, 14 by 16 (unit of measurement not mentioned), with shingled roof, doors, and windows.

These transactions often involved perjury on the part of the commuter and his witnesses, and sometimes subornation of perjury by his employer. Folwell comments that "it was a bold and impudent fraud practiced upon a generous nation. . . It may be said, however, that in the rough ethics of the pineries a process so extensively operated, so rarely denounced, and so tolerated by the government and by government officials seemed not to be so very wrong. There was little sense of guilt. In deed, so numerous and influential were those engaged in the operation that they seemed not merely innocent but positively meritorious" (Dana et al. 1960,p.103-04).

Les Beatty, an early state forest ranger whose reminiscences were published in the 1960s in several issues of the *Conservation Volunteer*, wrote about efforts by the government to investigate federal land law abuse. Beatty's writings have particular relevance because he was stationed in the Orr district office, which included in its jurisdiction the area now covered by Voyageurs National Park. In reflecting on his experiences in 1912, Beatty wrote that two officials from the U.S. General Land Office in Duluth:

. . . were frequent callers at the Orr ranger station in search of logging operation data on which we had a considerable, accurate file . . . Their functions included the location and examination of United States public domain lands upon which timber trespass had been committed as far back as the 1880's. They also examined public lands previously under file for homestead and timber claim entries as well as unentered lands requisitioned by the State of Minnesota under the federal school land grant law or other land grant legislation.

. . . Through their tedious searching and examining over a period of years, they informed us that the federal government was able to uncover and collect many thousands of dollars in timber trespass claims from loggers and others, sometimes even from the trustees of long liquidated companies. Another duty they performed was the tracking down of unscrupulous land and timber claim locators who moved government survey corner posts and set them up around fine stands of pine timber. This was quite a common practice among some locators to lure timber land investors, often women school teachers, clerks, and widows, into forking over a

\$250.00 to \$600.00 fee to the locators. Ranger Bessette and I were both willing aides to the special agents in their task of apprehending the deceitful and illegal timber land locators (Beatty 1963,p.48).

The records on logging operations that Beatty mentioned probably are on file at the Minnesota Historical Society. They should be investigated for further information.

Although small landowners sold tracts to the giants of the timber industry at a rapid rate beginning in the 1890s, sales of stumpage were quite prevalent. Such sales conveyed timber at a price per thousand feet to the buyer, but not the land. The State of Minnesota and the federal government sold stumpage, as did individuals.

According to Larson, the nation's "lumbermen were concentrating on Minnesota, for in 1913 that state still had more standing timber than either Wisconsin or Michigan, with about 12,500,000,000 board feet of white and red pine, as compared with Wisconsin's 3,000,000,000 and Michigan's 2,000,000,000 (Larson 1949,p.288). She noted the unusual situation in Minnesota, compared with the other states: ". . . six holders (in 1913) controlled no less than 54 per cent of the very valuable white and red pine in Minnesota; thirty-two holders owned 77 per cent of it. In none of the other Lake states were those types of timber under the control of so small a group" (Larson 1949,p.288).

Sale of State Lands

The State of Minnesota was a significant land holder, by virtue of the various grants from the federal government. According to Larson, "During the first fifty years of its existence Minnesota had acquired from the United States nearly 17,000,000 acres, plus swamp land yet unmeasured—a region as large as Massachusetts, Rhode Island, Connecticut, Vermont, and a third of New Hampshire" (Larson 1949,p.334). Unlike the federal government, the state tried to get top dollar for its land and the timber and minerals it contained.

In addition to getting a good price for its timber, the state's biggest concerns were, in Larson's words, "protecting it against fire and against trespass, and also in some manner conserving the forests" (Larson 1949,p.334). Various laws were passed to facilitate these efforts. In 1863 legislation authorized the Land Commissioner to sell pine stumpage on school lands, and in 1877 the law was strengthened in an effort to protect the state's

interests. Note that the school lands were not limited to sections 16 and 36, but also included "large areas of indemnity selections which the state was permitted to make when these sections had become occupied, reserved, or otherwise unavailable before the state obtained title to them" (Dana et al. 1960,p.137). According to Dana et al.:

It required a bond of timber purchasers, reserved title to and control over the timber until full payment of the purchase price, and established penalties for placing any but the agreed mark on logs cut from state lands. Still further safeguards were added in 1885. One of these authorized the sale of stumpage only upon approval of a majority of a board consisting of the Governor, the State Treasurer, and the State Land Commissioner. The legislature also provided that after the sale and removal of the pine timber, "the land may be appraised and sold in the same manner and on the same terms as other lands are appraised and sold under the provisions of this chapter" (Dana et al. 1960,p.134).

At the administrative level, Larson noted that four officials were responsible for the timberlands: estimator, scaler, surveyor general, and auditor or land commissioner (Larson 1949, p. 335).

The first step in preparing for the sale of timber was taken when the estimator, or appraiser, went into the deep forest to judge the timber, to study the lay of the land, to trace the logging stream, and to determine what should be the price of timber under these conditions. . . . When the timber was cut, the scaler began his job of measuring the logs that were to be sold. . . . The surveyor general supervised the work of the estimator and the scaler. It was also his responsibility to see that the cutting was done according to specifications and that the permit stated properly the amount of timber, the description of the land, the price at which it should be sold, and the log mark. . . . At the very top stood the auditor, who also held the position of land commissioner in the state. Upon him and his staff rested the final responsibility. It was the business of this executive to ferret out anything wrong (Larson 1949,p.336).

Fraud was as rampant in these school land sales as it was in the federal land sales of the period, perpetrated by public officials and timber operators. In 1893 a Pine Land Investigating Committee was appointed to investigate the fraud. Among its findings were: that the sale of timber was sometimes unauthorized, that the procedures outlined by Larson, above, were not followed (in fact, it was not unusual for the prospective buyer to be charged with describing the timber on the land and setting its value); that unqualified estimators and scalers not only were employed by the state but were profiting from their

positions; and that timber companies were not above using illegal tactics to obtain the state's timber (Larson 1949,p.337-38).

In 1895 new legislation was passed in attempt to remedy the situation. It also created the Board of Timber Commissioners, which regulated the sale of state-owned timber until 1925. Tamarack and cedar were authorized for sale (when "liable to waste"—which was not difficult to justify), and spruce, balsam, balm of Gilead, birch, and poplar stumpage became eligible for sale in 1909. Eventually, the school lands were either sold or put into state forests, which made them unavailable for sale (Dana et al. 1960,p.138).

As the State of Minnesota began to strengthen its efforts to protect its timber from theft or illegal sale, it also began to implement strategies for protecting timber and to initiate practices promoted by professional foresters. The process was not easy, for besides the need for better legislation, the attitudes of public officials needed to be changed. Les Beatty described the state's efforts to sell timber from its lands in northern Minnesota in 1913. He explained how the state sale was in conflict with good forestry practice, but why it occurred:

Late that fall (1913), the state auditor through legal notices in newspapers offered a large volume of state timber for sale to the highest bidders. The advertised offerings included stands of pine boarding on a number of lakes (Beatty, part IX 1964,p.60).

Beatty proceeded to describe the conflict between the state auditor and the district forester, who thought that "lake shore frontage (should) be reserved until such times that the stands could be thinned by selective cutting." The auditor believed that the forester's suggestions were "impractical, motivated by aesthetic reasons, and too costly to the state and to the purchasers," and, writes Beatty, the auditor thought that forest rangers and patrolmen "were considered to be upstarts with 'zany' ideas, guilty of trying to horn in on the auditor's long established authority over state lands and timber." The ranger, in fact, was attempting to "replace outmoded timber management practices with new ones beneficial to both the state and the purchasers in 1913" (Beatty, part IX 1964,p.60).

Voyageurs National Park

Land that today lies within the park was surveyed between 1881 and 1893, making it eligible for sale after the surveys were completed. When Frank H. Gillmor, superintendent of logging operations for the Virginia and Rainy Lake Lumber Company for 20 years, was interviewed by Lucile Kane in 1948, he described the VRL's involvement in "picking up claims" (purchasing homesteads). He stated that because logging companies had a certain amount of time to remove the lumber from homestead lands, they planned the railroads "in order to get all the timber off within the time limit. Some homesteaders sold their claims shortly after "proving up. If the claims were held too long, taxes, fire hazard, and investment of time reduced the profit" (Gillmor 7-24/25-48,p.5).

Sale of the land that today lies in Voyageurs National Park may have fallen under the parameters of the Nelson Act of January 14, 1889 (this needs to be verified; the act may only apply to lands ceded after 1889). The act, in part, created a policy regarding the disposition of ceded Indian lands. Dana et al. stated the following:

After completion of the cessions, all ceded lands were to be surveyed and classified as "pine lands" and "agricultural lands," which included all other lands irrespective of their character. All pine lands were to be sold, after advertisement, in 40-acre lots, at public auction at not less than their appraised value, which was to be not less than \$3.00 per thousand board feet. Lands not sold at auction were subject to private sale at not less than their appraised value. Agricultural lands were to be opened to actual settlers, who in addition to meeting the requirements of the Homestead Act, had to pay \$1.25 per acre for the land (Dana et al. 1960,p.83).

Conclusion

Despite the scores of land laws that were passed in the nineteenth and twentieth centuries to foster public protection of forest land, many of them were too late to help Minnesota's forests, which already were privately owned. Larson stated:

Through homesteading and commutation, the pineland area of Minnesota continued to pass into private control, and competition for pineland was growing more acute as sawmill men, particularly from Michigan, moved equipment, millmen, and loggers to Duluth and to Minneapolis — as they did in the 1890s and early 1900s (Larson 1949,p.284).

The Virginia and Rainy Lake Company was, by far, the largest land-owner in the area that became Voyageurs National Park. VRL had 400,000 acres of timber land, including

the homesteads it had purchased. The company had little interest in the land—because it was the timber it wanted, the company simply let many lots fall into state ownership by not paying taxes after cutting the timber. Sometimes the homesteader got the land back (Gillmor 7-24/25-48,p.5).

According to Frank Gillmor, “Twenty five hundred dollars was the going price for a timber claim. The lumber company gave a grub stake, had an informal agreement with the homesteader or preemptor to sell the claim when it was proved up” (Gillmor 7-24/25-48,p.2). Gillmor explained how the Virginia and Rainy Lake Company would “pick up claims:”

Some money could be made by the homesteaders who sold their claims immediately after proving up. If the claims were held too long, taxes, fire hazard, and investment of time reduced the profit (Gillmor 7-24/25-48,p.5).

Larson bluntly stated the aftermath of the tangle of misused land laws, and efforts to remedy them: “The new laws came too late to save the white and red pines of Minnesota,” claimed Larson (Larson 1949,p.333).

Barbara Wyatt, 1999

APPENDIX 3:
MINNESOTA SHPO CONTEXT DESCRIPTION
NORTHERN MINNESOTA LUMBERING, 1870-1930s

Lumbering, like other nineteenth-century industries, was based on one of the state's abundant natural resources--the extensive pine forests located north and east of the Mississippi River. Begun in the east-central part of the state, the "St. Croix triangle," in the mid-1830s, the lumbering industry expanded northward and westward. The greatest activity outside the St. Croix triangle area took place after 1870 as capital investment increased, markets expanded, and logging and lumbering equipment became more advanced. By the turn of the century, Minnesota was the third largest lumber producing state in the nation; three of the four largest sawmills in the country were located in Minnesota; and Minneapolis had become the leading lumber market of the world.

Between 1870 and 1890, logging occurred primarily in the vicinity of major rivers and their tributaries. Logs would be cut during the winter and floated to downstream mills the following spring. The Mississippi, St. Louis, Big Fork, and Rainy rivers were the major transportation arteries. The development of railroads, however, was the single most important factor in the industry's rapid growth after 1870. Railroads pushing out onto the Great Plains created a rapidly expanding market for Minnesota lumber. Rail construction in northern Minnesota also opened previously inaccessible timberland to logging activity, reduced the lumbermen's dependence upon risky water transportation, and permitted the location of sawmills closer to the timber supply. In addition to the common carriers, large logging/lumber companies built railroads beginning in the late 1880s. By 1910, the logging railroad had become the primary method of log transportation.

Minnesota's lumber industry peaked at the turn of the century. Lumber production gradually fell off for a decade before declining sharply through the 1920s. With the closing of the last major sawmills in the early 1930s, a significant and colorful era in Minnesota history had come to an end.

As the lumber industry declined, several lumber companies established plants to utilize the state's abundant supply of "inferior trees." By the mid-1920s, the wood conversion industries (primarily paper manufacturing) had surpassed the lumber industry in value of product.

Agricultural settlement of the region proceeded slowly prior to 1890 as land seekers were drawn to the western plains. But the closing of the rich prairie lands combined with a growing awareness of the need to develop a new economic base for the region triggered an agricultural land boom in northern Minnesota. Lumber companies, railroads, chambers of commerce, land colonization companies, real estate companies, the State Bureau of Immigration, and other private and public agencies expended considerable energy to encourage settlement of the cutover.

Farming the cutover, however, proved to be an unsuccessful experiment in most cases. The poor soil, an unfavorable climate, and the high cost of bringing cutover land under cultivation made profitable farming operations unlikely. But as long as the lumber industry provided local markets for agricultural products and seasonal employment, agricultural settlement continued. The lumber industry's rapid decline in the 1920s, combined with a national farm-sector depression, caused widespread hardships that resulted in abandonment of many farms during the 1920s and 1930s.

Even before the end of the "boom era" in northern Minnesota lumbering, efforts at conservation had begun. The establishment of Itasca State Park (1891), the Minnesota State Forestry Board (1899), and the Chippewa and Superior National Forests early in the 20th century testified to state and federal conservation interests. Generally speaking, conservation during this period focused on achieving the wisest use of forest resources over a longer period of time than usually employed by "get rich quick" lumbermen. Fire control was another primary concern.

PROPERTY TYPES ASSOCIATED WITH NORTHERN MINNESOTA LUMBERING

Camps

- logging
- farm and headquarters

Transportation

- river
- railroad

Sawmills

Related industries

- paper company offices

Markets and market exchanges

Townsite properties

- logging/lumber industry
- commercial
- government
- schools and libraries

Properties associated with cutover agriculture

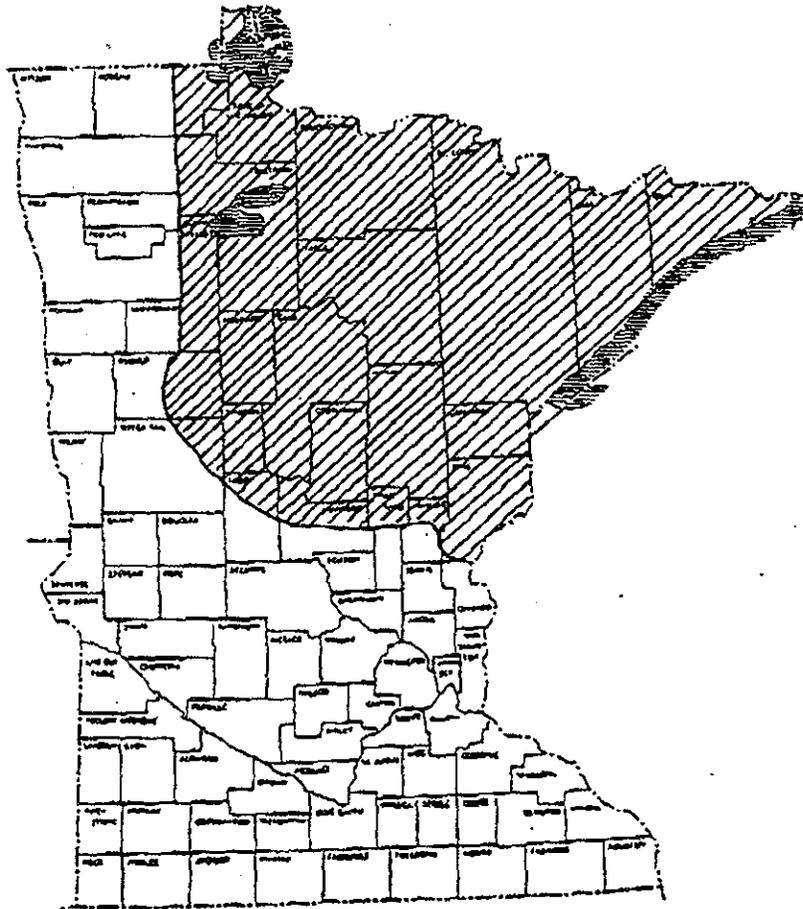
Properties associated with conservation

Historic Context:

NORTHERN MINNESOTA

LUMBERING

(1870 - 1930s)



APPENDIX 4: HISTORY OF FORESTRY IN MINNESOTA

This review of Minnesota forestry is excerpted from *Forestry in Minnesota* (St. Paul: Department of Conservation, Division of Forestry, 1961). The author of the report was not identified.

HISTORY OF FORESTRY IN MINNESOTA

A Review of Minnesota Forestry

Vast forests covered much of the land that was to become Minnesota. The northern half, except for a narrow fringe of prairie on the western border, was covered with virgin white and Norway pine, interspersed with spruce and hardwoods. The southeastern section was clothed with magnificent hardwood forests. The rest was open prairie.

Explorers and missionaries came to the area in the seventeenth century. In 1689 it was claimed for France by Nicolas Perrot. By the Treaty of Versailles the area east of the Mississippi river was ceded to England. In 1783 it came under the jurisdiction of the United States. The country west of the river had been ceded to Spain, then France obtained it, and in 1803 it was included in the Louisiana Purchase.

At the beginning of the nineteenth century settlers began to drift into the hardwood forests in the southeastern part of the state. They immediately began to cut the timber. They needed it for building their log homes and they had to get rid of the forest to make room for their crops. Although the prairies were not far beyond, the Sioux Indians were still guarding that territory against invasion.

1821 All building material used by the settlers had to be cut with an ax or sawed by hand. Although the government had constructed the *first sawmill* at St. Anthony Falls in 1821 to supply timber for Fort Snelling, it was not until 1837 that the *first commercial sawmill* was built at Marine-on-the-St. Croix to saw white pine lumber.

1843 Many additional sawmills sprang up and lumbering inevitably became the leading industry of the state. Four mills were opened at Stillwater after 1843, and in 1847 a commercial sawmill was built at St. Anthony Falls.

1862 The *first railroad* came to Minnesota. By 1870 it had pushed as far north as Duluth, and after that the lumber from the north could come south to Minneapolis.

Paper mills followed the sawmills at Cloquet, Grand Rapids, International Falls, Brainerd, Little Falls and Sartell. This made a market for the smaller material of many species, such as spruce, jack pine and aspen.

Until the 1870's logging and lumbering, not forestry, typified the timber industry. About that time sentiment was growing in favor of a more sound policy in the utilization of

forest land. In 1862 the state timber lands had been broadly divided into pine lands and non-pine lands. The state land commissioner could sell *pine lands* in any manner he wished. The legislature of 1877, however, provided that lands should not be sold in the future until the timber on them had been estimated, appraised and sold.

- 1871 The first law pertaining in any way to forestry in Minnesota was the *tree bounty law* passed in 1871. It provided for paying a bounty for planting trees on the prairies, which resulted in the planting of many farm woodlots and windbreaks.
- 1876 The need for a rational program of forest use began to impress itself upon a small group of forward looking people, and in 1876 there was formed an organization known as the *Minnesota State Forestry Association*.
- 1891 *Itasca State Park* was established by an act of the legislature. It constituted the first positive step on the part of the state to preserve a part of its forest domain. The following year all government lands within the park were granted to the state by Congress.
- 1894 The rapid disappearance of the forests by the ax and fire attracted little attention. It took a catastrophe to shake people out of their complacency. When the *great Hinckley forest fire* of September 1st took the lives of 418 human beings it was brought tragically home to them.
- 1895 The legislature took the first small step toward preserving the forests and preventing forest fires by the appointment of the state auditor as *forest commissioner*. He was authorized to appoint a chief fire warden to enforce the laws which were passed for the preservation of forests and the prevention and suppression of forest and prairie fires.

General C. C. Andrews, long a pioneer in the fight for forestry, became Minnesota's *first chief fire warden*. In his first annual report he showed an area of 11,890,000 acres of forest lands in the state and nearly 25 billion board feet of timber, of which more than 18 billion were pine, three-fourths white pine.

- 1899 The *first forestry board* was created by the legislature. It had nothing to do with the prevention and suppression of forest and prairie fires. Its sole authority was the management of state lands granted to the state by the federal government or any private person for forestry purposes.

The following year Minnesota's *first forest reserve* was established when Governor John S. Pillsbury offered the state about a thousand acres of cut-over pine lands in Cass County. It was accepted and became the *Pillsbury State Forest*.

- 1903 Minnesota's *first tree nursery* was established on the Pillsbury Forest following a resolution by the forestry board. The following spring 86 pounds of seed were planted.

Burntside State Forest was established on 20,000 acres of rough rocky land north of Ely in St. Louis County deeded to the state by Congress.

- 1907 The *School of Forestry* of the University of Minnesota was given the use of a tract of land in Itasca Park for forest demonstration work.

Governor John A. Johnson, the first governor to advocate forestry in his message to the legislature, became an ex-officio member of the forestry board.

- 1908 On the 4th of September a fire swept over the mining village of *Chisholm*, and another town was wiped out by a forest fire. At the legislative session the following year the forestry commissioner (the former chief fire warden) was authorized to appoint a corps of forest rangers in case of a dangerous fire season.

The Chippewa National Forest, containing 190,000 acres, was established by an Act of Congress. The following year the Superior National Forest, containing 909,734 acres, was established by Presidential Proclamation. Their area has increased to 1,313,656 and 2,873,281 acres, respectively.

- 1910 About six weeks after the handful of rangers had been laid off because of lack of funds, another forest fire tragedy struck Minnesota. It had been the driest year ever recorded in the state. On October 9th a terrific wind fanned the many small fires into a holocaust and before the day ended *Baudette* and *Spooner* lay in ashes. Forty-two people perished in the fire.

- 1911 Following the tragedy the legislature enacted laws which marked the beginning of the present *Minnesota Forest Service*. All responsibility was transferred from the state auditor and placed under a forestry board. Only the management of state timber remained under the auditor. The board of nine members appointed Wm. T. Cox as Minnesota's *first state forester*, and General C. C. Andrews as *secretary*. Mr. Cox organized the state forest protection system with district rangers under whom worked state and federal patrolmen.

- 1914 A constitutional amendment (Sec. 7, Art. VIII) was passed which set aside *trust fund land as state forests*. In 1917 the legislature set up some 350,000 acres of state lands in northern St. Louis, Lake and Cook Counties as state forests. That same year the first extensive tree planting was undertaken when wild stock dug up in the woods was planted on various types of land. The following year 200,000 3-year-old seedlings were planted on the Burntside State Forest.

- 1918 Another frightful forest fire disaster occurred. On October 12 a hurricane of fire wiped out the town of *Cloquet*, most of *Moose Lake* and more than a dozen smaller villages. Four hundred thirty-eight people lost their lives. Even this tragic demonstration of the need for more funds for fire protection made little impression. However, one important law was passed, namely the *burning permit law*. Previous to its passage, anyone could start a fire wherever and whenever he felt so inclined.

- 1924 The enactment of the federal *Clarke-McNary Act* provided the state with increased funds for fire prevention work, and has continued to provide financial assistance to the present time.

- 1925 The first *Conservation Commission* was created and the first Department of Conservation set up. The state forester became the commissioner of forestry and fire prevention.

The *forestry laws* were reorganized and *codified*. The *forest area* of the state was defined as any county having 1,000 acres or more of timber or unbroken prairie land or of cutover land not cleared of combustible material.

- 1927 The first *Christmas tree law* was enacted, governing the cutting of Christmas trees. In 1935 the law was strengthened by providing that all Christmas trees must be tagged.

- 1929 The first *land exchange law* in the form of an amendment to the constitution was proposed. Time after time it failed to pass. Not until 1938 was it adopted.

- 1931 *Reorganization* of the Department of Conservation took place. The three-man Conservation Commission was abolished. The new department functioned under a five-man commission appointed by the governor, and was empowered to employ a Commissioner of Conservation for a six-year period. All the powers and duties formerly vested in the state auditor regarding public lands, waters, minerals and timber were conferred on the Commissioner of Conservation. The administration of state forests and the sale of state timber on state forest lands were put under the control of the Division of Forestry in that timber was to be sold by the auditor only upon the recommendation of the Director of Forestry.

- 1933 The legislature passed a law providing that all income from acquired lands within state forests was to be credited to the general revenue fund of the state, and that 50 per cent of the gross receipts from such lands was to go to the counties in which the lands were situated.

The *Civilian Conservation Corps* camps were established, and practically overnight thousands of young men were available for work in fire protection, fire fighting, forest management and nursery work. An additional *thirteen state forests* were set up by the legislature upon which CCC work could be done.

- 1935 A separate *State Parks Division* was set up. However, the timber in Itasca Park remained under the jurisdiction of the Division of Forestry.

One by one the needed laws were enacted. *Wilful burning* was changed from a misdemeanor to *third degree arson*. Cities were authorized to obtain lakeshore lands for *municipal forests*. *Peat lands* were withdrawn from sale. Again *thirteen state forests* were established. The Director of Forestry was empowered to *acquire tower and ranger station sites, to close roads and trails* through forest areas when fire conditions warranted, and to *clear up fire hazards* along roadsides.

All *state parks* were put in charge of the Division of Forestry.

The legislature authorized the production of tree planting stock, limited to native conifers for planting on state owned lands. The *Badoura Nursery* near Akeley had actually made a beginning several years before, and seedlings were soon available for planting.

- 1937 *Reorganization of the Conservation Department* took place again. The Conservation Commission was abolished and replaced by a Commissioner appointed by the governor. This system prevails at present.
- 1939 A forward step in the administration of *tax-forfeited lands and timber* was taken by the passage of a law providing for the classification of the lands and the appraisal of the timber and its approval by the Commissioner of Conservation before the land could be sold.
- County land zoning* also was authorized. Eight counties subsequently zoned their lands and established boundaries between conservation and non-conservation lands.
- A second *forest tree nursery* was started near Willow River, and named for General C. C. Andrews, Minnesota's first chief fire warden. It was developed largely with WPA labor.
- 1943 Throughout the years, state forests had been established under various laws. In 1943 the state forest laws were codified and 29 *state forests reestablished* under one act. Three of the original forests, namely the Burntside, Bowstring and the Minnesota State Forests were not included in the new law.
- Minnesota's first *minimum cutting regulations* law was enacted. It regulated the size of trees to be cut and provided for leaving seed trees.
- 1944 The *Keep Minnesota Green* movement was organized in Minnesota, and it became the third state in the Union to inaugurate such a movement, having been preceded only by Washington and Oregon. KMG, Inc., has become an important factor in the forest fire prevention education program in this state. It also sponsors the *Tree Farm program* which was inaugurated nationwide the previous year. More than a thousand tree farms were set up by 1958 and over 600,000 acres of private forest land placed under forest management.
- 1945 The establishment of tax-forfeited lands as *county memorial forests* was authorized by the legislature. Twenty-seven such forests have been set up, covering 840,000 acres.
- 1946 *Private forest management assistance* to owners of forest land was begun with the employment of two trained foresters with funds in the amount of \$8,000 provided by forest industries. The following year, 1947, a legislative act provided for private forest management service to owners of not more than 1,000 acres, and the work continued.
- 1947 After an unsuccessful attempt to provide *planting stock* to land owners through contracts with commercial nurseries, the Division of Forestry was authorized to produce stock of all species *for use on privately owned lands*. Production of trees was immediately accelerated.
- 1949 The *Christmas tree tagging* law was repealed. A new law provided for a *transportation permit and the written consent* of the land owner.

- 1953 The *Norway pine* was designated as the official Minnesota *state tree* by the legislature.

The Division of Forestry was empowered to furnish *tree planting stock* free of charge for use on auxiliary forests owned by social, educational, or charitable organizations.

The *Chengwatana State Forest* in Pine County was established, bringing the number of state forests to 33.

- 1955 Another state forest was established in Aitkin County, the *White Pine State Forest*, bringing the total to 34.

The \$800 *auction timber sale* was authorized. This provided a timber sale between the large auction sales and the small permits.

An *inventory of the timber* on the 4,750,484 acres of state land owned or administered by the Department of Conservation was completed and published. It was the first such inventory in the history of the state.

- 1956 *Reorganization* of the Division of Forestry was completed. Since 1911 it had operated on a functional staff basis. The reorganization resulted in a modified line-and-staff organization. The functions of the division were divided into two sections, State Land Management, and Cooperative Forestry, each in charge of a Section Chief. The following year the field was reorganized into four Regions, each in charge of a Regional Forester; 18 Administrative Areas, each in charge of an Area Forester; and 74 Ranger Districts, each in charge of a District Ranger.

The *Carlos Avery Nursery* near Forest Lake, developed by the Game and Fish Division, was transferred to the Division of Forestry for the purpose of consolidating all tree nurseries under one division.

The Division entered into agreements with the U. S. Forest Service for cooperation in the federal *Soil Bank Conservation Reserve* program and the *Agricultural Conservation* program. The Division agreed to grow forest planting stock for use in the programs and to provide technical forestry assistance. As a consequence all three state nurseries were expanded considerably.

- 1957 The first Friday in May was designated permanently as *Arbor Day* in Minnesota by the state legislature.

The *Minnesota Tree Growth Tax Law* was passed. It permitted privately owned lands suitable for the growing of forest products to be taxed on the basis of the annual increase in value, to encourage land owners to retain and improve their timber lands and keep them on the tax rolls.

- 1958 A special session of the legislature provided \$1,500,000 to the Commissioner of Conservation for unemployment relief in certain areas of the state, particularly the Iron Range. A great many *conservation work projects* were accomplished.

The first *intensive forest fire protection in Southeastern Minnesota* under the direct supervision of the division was inaugurated.

- 1959 The so-called *dump ground fire law* was passed which permitted the Commissioner of Conservation to stop dumping in an area when deemed necessary and to require a firebreak around the dumpground or such other measures as to prevent the spread of fire to adjacent forest land.

On May 1st the 14,000-acre *Badoura fire* occurred. It was of incendiary origin and endangered the Badoura nursery. Damage to reproduction and plantations was very extensive.

Prompted by the Badoura fire, at the special session of the legislature, *wilful burning of pine lands* was made a felony, punishable by a year's imprisonment and a \$1,000 fine or both.

The former maximum limit of \$250 in appraised value on *small timber sale permits* was increased to \$350.

By order of the Commissioner of Conservation 830,116 acres of state land were reserved from sale and *set aside as state forests* to be added to existing state forests.

- 1960 Beginning in 1895 with a single employee whose salary was \$1,200 per year, and an appropriation of \$5,000 for forest fire prevention, Minnesota's Division of Forestry has developed into an organization of some 350 permanent employees, of whom 35 are graduate foresters, and an annual appropriation of nearly two million dollars.

Its duties are complex and cover not only forest fire protection and suppression, but the management of state lands, timber and forests, the operation of state tree nurseries, tree planting, the supervision of auxiliary, municipal and school forests, the Christmas tree industry, recreational area development, forest insect and disease control, private forest management service, and many related activities. Each major activity is described separately in this booklet.

APPENDIX 5: VIRGINIA AND RAINY LAKE COMPANY LOGGING CAMPS

The following text and drawings are reprinted from *Archeological Investigations at Voyageurs National Park: 1979 and 1980*, Mark J. Lynott, Jeffrey J. Richner and Mona Thompson (Lincoln, NE: NPS, Midwest Archeological Center, 1986).

Virginia & Rainy Lake Logging Company Sites. One component of the 1980 project at Voyageurs consisted of preliminary survey of select sites related to the extensive early twentieth century logging which occurred within the Park. Voyageurs National Park staff historian, Mary Lou Pearson, provided the research team with a listing of Virginia & Rainy Lake Logging Co. (V & RL) camps located within St. Louis County. This company was one of the major logging enterprises active in the area. The list included legal descriptions of the approximate locations of the former camps sites, and a brief statement of their duration and function (Peralla 1967: table 2). After plotting the site locations on U.S.G.S. quadrangle maps, we determined that 26 of the 143 St. Louis County camps are located within the current boundaries of the Park.

While the locations of several logging camps within the Park were known to Park maintenance workers and other staff members prior to our survey, no systematic attempts to relate any of these camps to the V & RL list had been undertaken. As time permitted during 1980, we surveyed six locations from the V & RL list. Many of the reported locations were in areas of very difficult access, so we attempted to investigate only a few areas that were readily accessible. A total of four logging camps were located during our survey. Two other reported locations were investigated with negative results.

Virginia & Rainy Lake Logging Camp #129 (21SL158). This logging camp is located near the northeastern tip of a point of land on the eastern edge of the Kabetogama Peninsula, facing south east toward Kubel Island. The site is listed as camp 129 on the V & RL logging camp list for St. Louis Co. (Peralla 1967:114). Its legal description was given as NE $\frac{1}{4}$, NW $\frac{1}{4}$, Section 14 T69N, 19W.

Its more precise location is SE $\frac{1}{2}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$, NW $\frac{1}{4}$ Section 14 T 69N, 19W. The site location was previously known to the Park maintenance staff, but its relationship to the V & RL company had not been determined. The outlines of seven structures represented by mounded earthen embankments were recorded at the site. The peninsula on which the site occurs is dominated by bedrock outcrops, and the site was easily located since vegetation did not mask the foundation remains. It was clear from the paucity of surface artifactual remains that heavy collecting pressure has been exerted on the site--probably due to ease of access and lack of dense vegetation cover. The layout of the camp as represented by the structures is seen in Figure 7. According to the St. Louis Co. V & RL camp list, this camp was in operation from June 1926--September 1927. During this period, a total of 5,660,460 board feet of lumber was processed through this camp (Peralla 1967:114).

Earthen embankments revealed the former presence of nine structures at this site, in addition to one wall of a tenth. Seven of the structures were aligned parallel, with their long axes running ca northwest-southeast. The two smallest structures (#2 and 3) were not aligned on this compass orientation.

Structure #1. This was the largest structure at the site (25 x 12 m), and was atypical in that a 5 x 4 m "notch" in the northwest corner disrupted its rectilinear shape. No openings were apparent in the earthen embankment. A complete quart liquor bottle was located outside the northwest wall of the foundation.

Structure #2. This small square structure was away from the main cluster of structures and was 4 x 4 m in extent. No obvious openings or breaks were visible in the earthen embankment.

Structure #3. This small structure (5 x 5 m) was similar to #2 in that no apparent openings in the embankment were recorded. It differed in that a deep (ca. 1 m) depression was visible in the center of the area outlined by the embankments. This depression may represent an old pot hole, but this interpretation is uncertain.

Structures 4,5,6,7 and 8. These structures are arranged in a tight row, with the southwest wall of each structure oriented on a straight line. The walls are very close together with no room for doors between the structures.

Structure #4. This was the largest structure in the cluster, 19.5 x 9.5 m in extent. An opening (door?) was present at each end.

Structure #6. This structure was the same size as structure #4, but had an opening in the embankment only on one end.

Structure #5. This structure was 9.5 x 5.6 m in extent, and had an opening in the embankment on the southwest wall. A sizable white birch tree (110 cm circumference) has grown inside the area marked by the foundation of this structure.

Structure #7. This 10 x 6.5 m structure had an opening (door?) on the northeast wall.

Structure #8. This structure was 10 x 8.75 m in extent. The southwest mounded embankment was unclear, and seems to have eroded considerably. No obvious openings were observed in the earthen foundation.

Structure #9. This 8.75 x 8.75 m structure was located a short distance away from the others, but was oriented similarly. The earthen embankment was quite distinct for this structure, and was higher than those seen at any other logging camp site. The embankment had an opening on the southwest wall which appeared to represent a former door. The structure was atypical in that another opening was present at the southeast corner. No other logging structure recorded in 1980 exhibited a similar open corner.

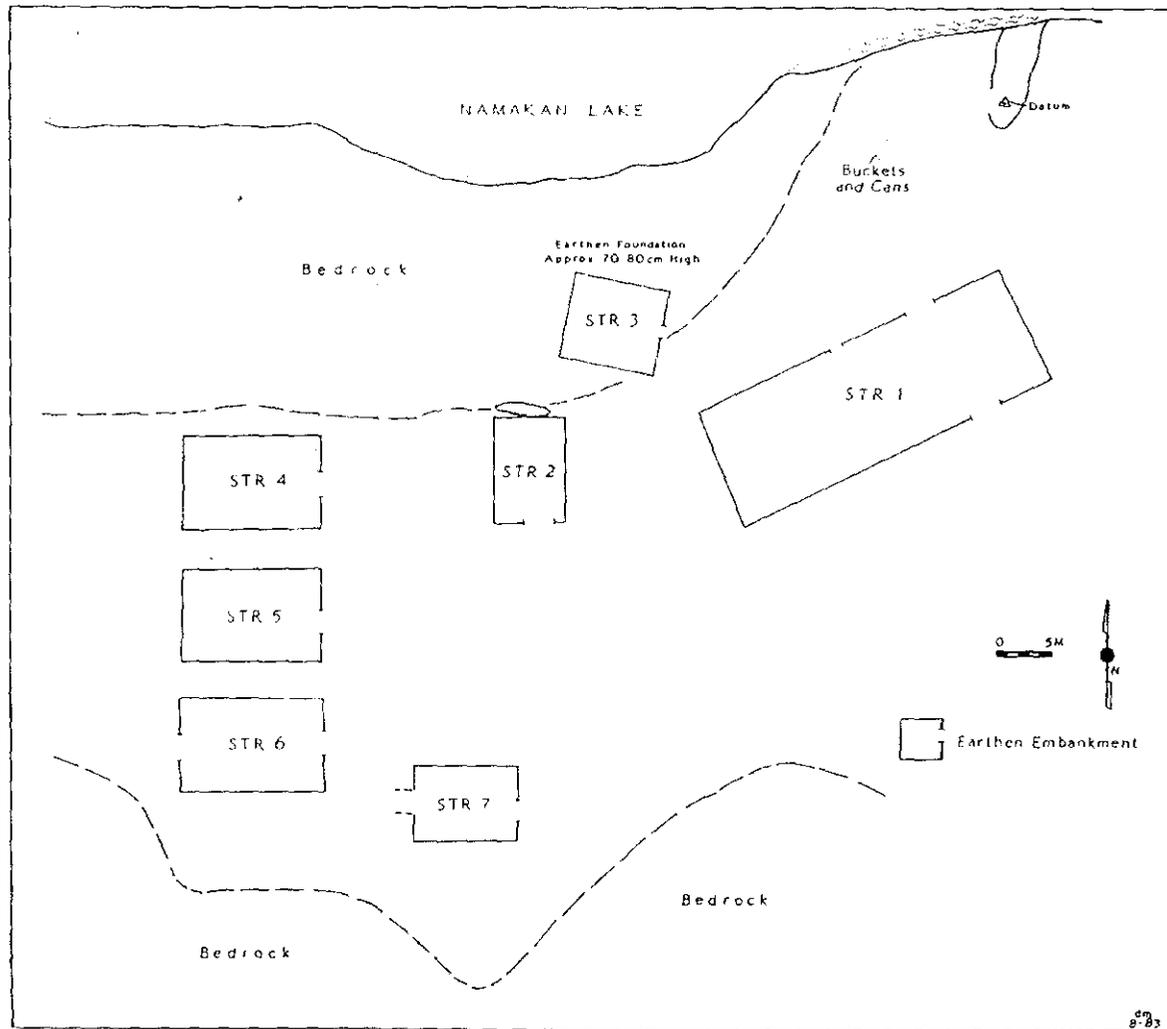


Figure 7. Virginia and Rainy Lake Camp #129.

The site is at an elevation of ca 1130 ft. and, due to the extensive bedrock formation of the peninsula, the area has not been adversely impacted by erosion. It appears that the only significant impact to the site has been the unauthorized collection of artifacts. In 1980, no collections were made and no shovel testing or test excavations were undertaken.

The sandy soil at the site appears to be quite shallow, and bedrock outcrops occur over much of the peninsula on which the site is located. While the total extent of the site was not determined, the area encompassing the structures is ca 65 x 80 m. Certainly, the actual site was considerably larger than the area containing the structures.

The former presence of seven structures was recorded at this well preserved logging camp as evidenced by low mounded earthen embankments. Five of the seven structures were oriented on a grid closely approximating NS-EW. The remaining two structures were not aligned on this system.

Structure #1. This large structure (31 x 11.5 m) had three openings in the embankments; two on the north wall, and one on the south. The opening on the south wall and one on the north were quite large (3 m long), much wider than one would expect for a single doorway. Large "barn" doors, or similar access may have been present in these locations. The third opening in the embankment is much smaller, and may have served as a door.

Structure #2. This 6 x 10 m structure had a large opening on its south embankment. No other breaks in the foundation were apparent.

Structure #3. This structure was 8 x 7.5 m in extent and had a small opening on the east side.

Structures #4, #5, #6. These structures were in a row, and each was 12.5 x 8 m in extent. Structures 4 and 5 each had an opening in the embankment on the east end, while structure 6 had openings on both the east and west ends.

Structure 7 was different from the others in that it appeared to have a narrow alcove or similar extension on one end. This structure was 9 x 7 m in extent and had openings on both the east and west walls.

Structures 2,4,5,6 and 7 were oriented NS-EW, while structures 1 and 3 were not aligned on this pattern.

The site contains excellent potential for future research, particularly when seen in concert with the numerous other well-preserved logging camps within the park. Despite the relatively shallow soil which occurs at the site, subsurface cultural remains are expected to be in situ, as there is little evidence of site disturbance. The mounded embankments which outline structures are in excellent condition, and have not been disturbed.

Virginia & Rainy Lake Logging Camp #111 (21SL161). This site was easily located through surface survey, and occupies a narrow peninsula off the southeast tip of Sheen Point in Junction Bay. The peninsula is rocky, and exposures of bedrock are visible at several portions of the site. This was

the only logging site recorded in 1980 which contained structural foundations cut into soil and loose rock in addition to the common mounded embankment style of construction. This deviation was apparently necessitated due to the topography in the area where structure #1 was assembled. Mounded embankments were recorded for at least six structures at the site. One embankment was unclear as to shape and extent, and it is possible that other poorly defined foundations are present in the large clearing on the north edge of the site. The clearing is most likely a component of the site such as a log staging area, corral, or other special use area. The area encompassing the structures is ca 30 x 70 m (Figure 8), while the site as a whole, including the clearing is ca 45 x 100 m.

V & RL logging camp 111 was in operation from October 1924 to May 1925. Over 1,680,000 board feet of lumber were cut by workers from this camp (Peralla 1967:113).

The six structures at this logging camp were all aligned with their long axis NE-SW. This orientation seems to have been selected to best fit the small peninsula on which the camp was built. Five of the structures were constructed in a tight cluster, while the sixth was located a short distance north of the main group.

Structure #1. This large structure was unlike any other recorded during 1980. The east wall was dug into loose rock and soil, rather than being demarcated by an embankment of soil. Further, a square "addition" is present on the east wall (Figure 9). The main structure was 10.25 x 27 m in extent, while the "addition" was 7 x 7 m. The main part of the structure had an opening on the southwest embankment wall, while the addition opened into the larger structure, and had no external openings. Some large sheet metal scrap was recorded inside the structure. This structure was also unusual in that erosion from a well-used beaver trail has significantly disturbed the northeast edge of the structural remains. A gully has formed in this area, and the earthen embankment has been considerably eroded.

Structure #2. This 9 x 19 m structure had no clear-cut openings in the embankments and also exhibited a small depression in the northeast corner.

Structure #3. Similar to structure #2, no openings in the earthen embankment around this structure were apparent. In addition, the northeast wall was not clear, due to erosion.

Structure #4. This structure was similar to structure #3, although at 7 x 19 m, was slightly smaller. No openings in the earthen embankment were observed.

Structure #5. This 5 x 17 m structure was somewhat smaller than those adjacent to it, but was similar in other respects, including the lack of clear openings in the earthen embankment.

Structure #6. This structure was located a short distance away from the others, in a grassy clearing. Two parallel earthen embankments were visible in the tall grass, but the precise shape of the structure could not be determined.

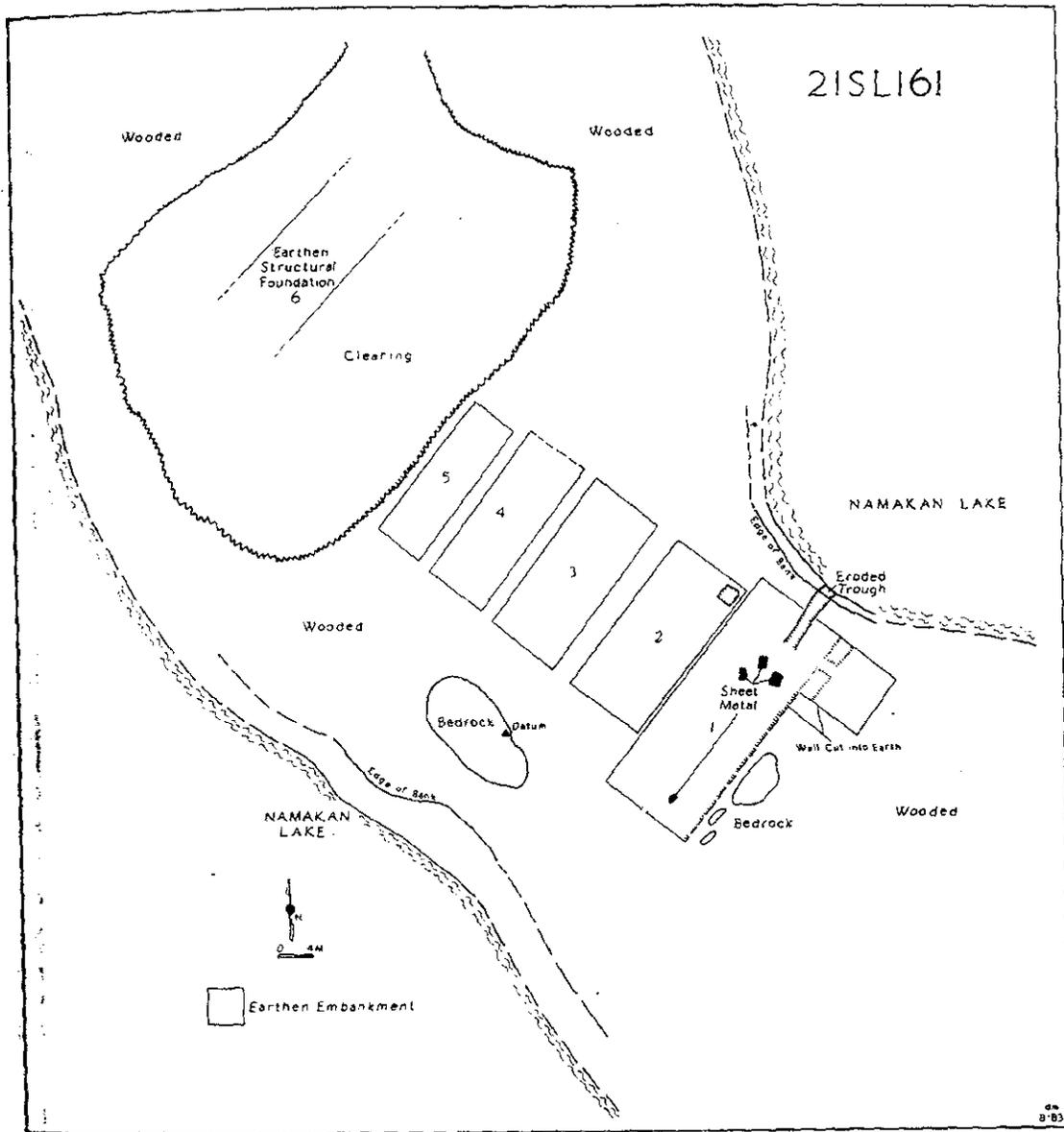


Figure 8. Virginia and Rainy Lake Camp #111.

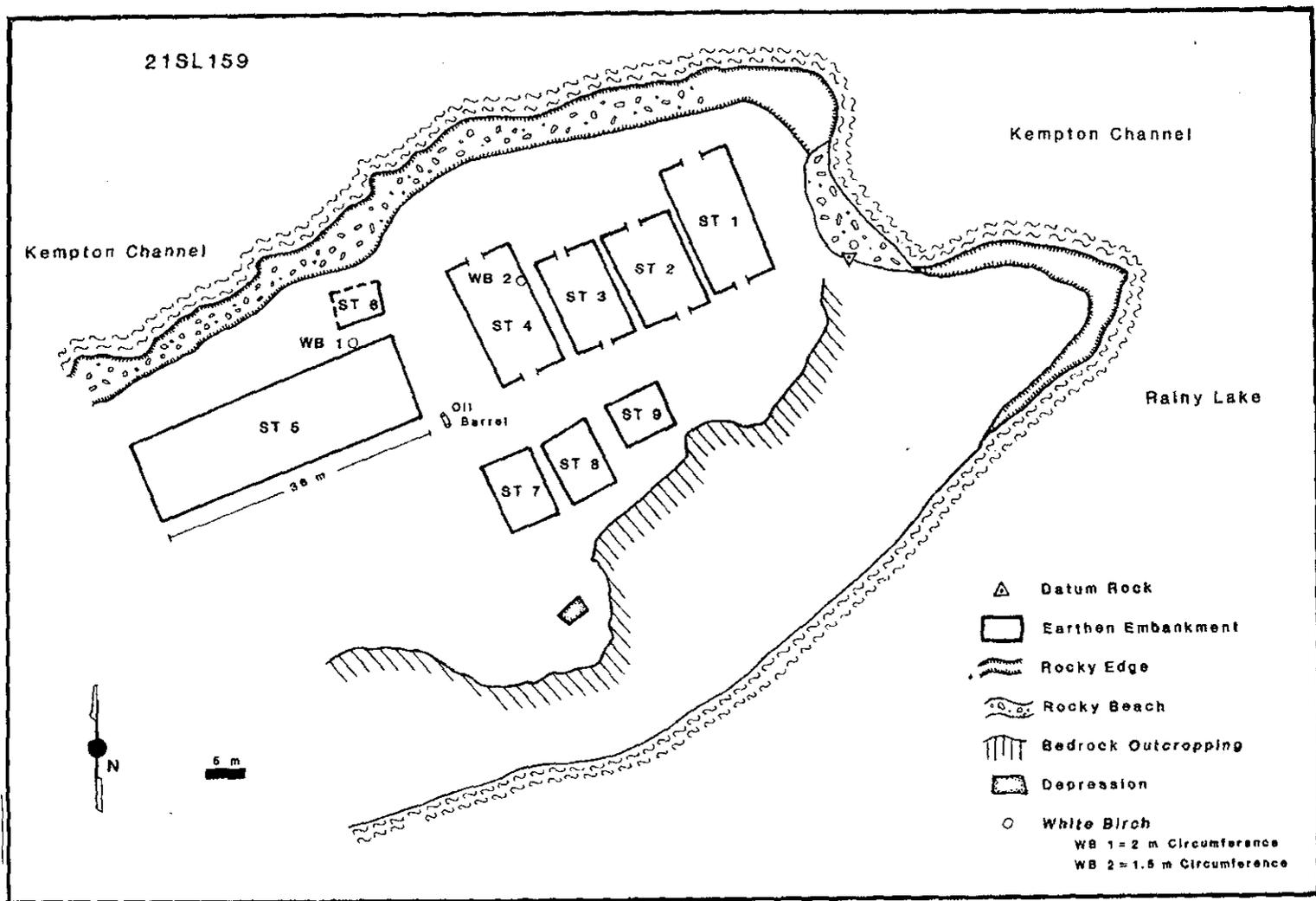


Figure 9. Virginia and Rainy Lake Camp #137.

From the lack of surface artifacts at camp 111, it appears that considerable surface collection of cultural material has taken place. The site area, especially along the west edge, is used by fishermen, but this activity is not having a negative impact upon the structural remains. The majority of surface artifacts have already been removed from the site. The only cultural material visible at the site during our survey was fragments of metal scrap and sheeting which occurred scattered in and around several structures.

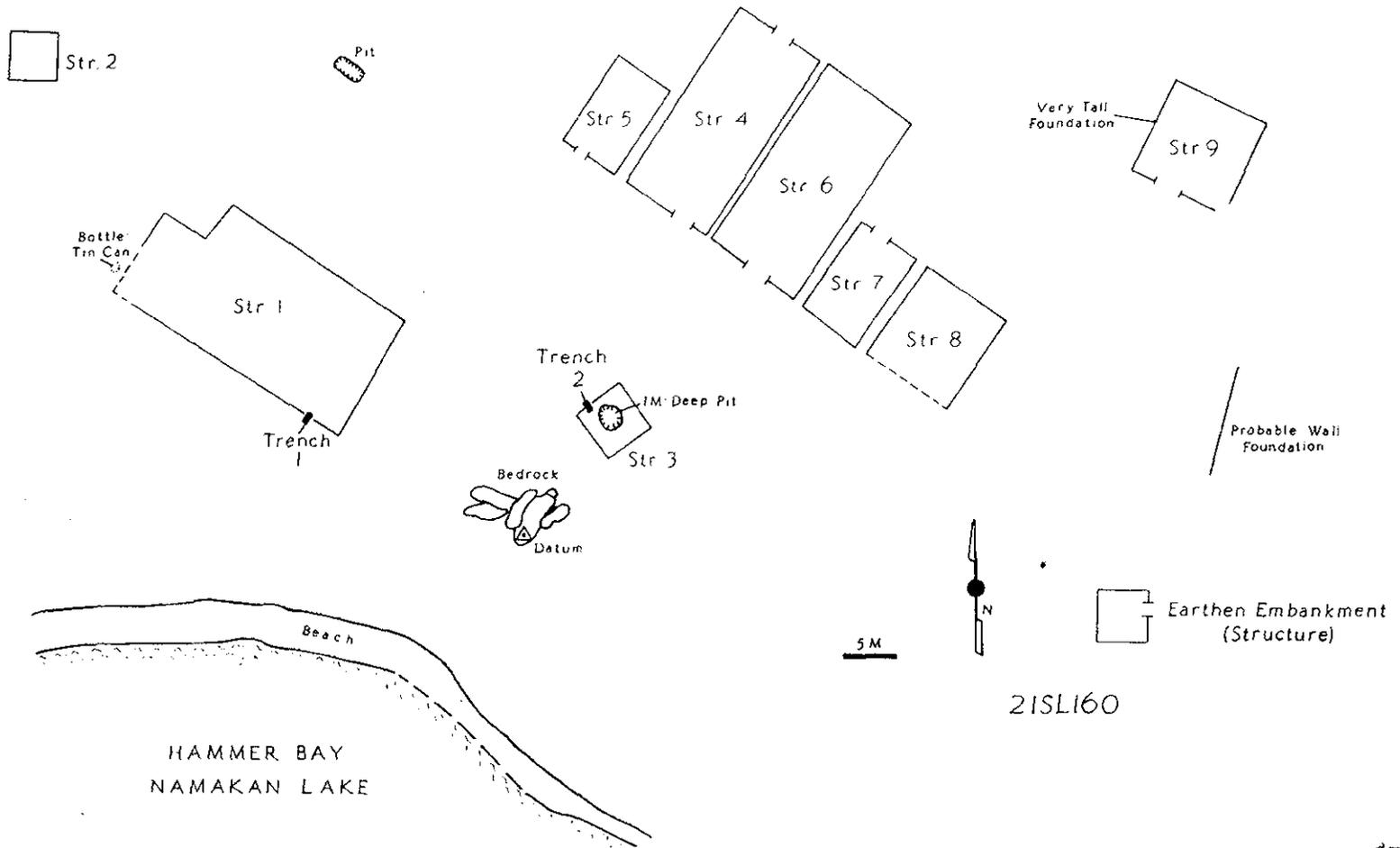
Although some disturbance of site context has been documented above, for the most part the site remains in excellent condition, and contains considerable potential for future work. No evidence of subsurface disturbance except minor erosion was documented.

Virginia & Rainy Lake Logging Camp #137 (21SL159). This large logging camp is located on the north edge of a small peninsula on the north side of the Kabetogama Peninsula on Rainy Lake. The site is located just off the west edge of Big Island and a short distance south from Kawawia Island. The legal description for this site is SE $\frac{1}{4}$, SW $\frac{1}{4}$, NE $\frac{1}{4}$, NE $\frac{1}{4}$ Section 22 T 70N R20W. Gibbon had previously recorded an historic site at this same location (36-3); and had identified the site as potentially representing an Historic Chippewa village (Gibbon 1977:218). Gibbon indicated that evidence of 24 structures occurred, but we recorded earthen embankments for only nine structures (Figure 9).

Based upon locational data from the V and RL camp list for St. Louis County (Peralla 1967) and the nature of site size and layout, the site represents the remains of an early twentieth century logging camp rather than an Indian village. Camp #137 was in operation from March 1928-March 1929. A total of 3,653,360 board feet of lumber were cut and processed through this camp, which is one of the later V & RL camps in Voyageurs National Park. The foundations of nine structures are clearly outlined by rectangular, earthen mound enclosures at the site (Figure 10). The structures are encompassed within an area ca 50 x 85 m, with total site size unknown. Field methods were limited to site mapping. No shovel tests or test pits were excavated, although one glass bottle was collected from the surface of the site.

Most of the nine structures at the site are aligned on a north/south-east/west axis, and are positioned in two rows (Table 2). Structures 1-4 are parallel to each other, are 1-2 m apart and are aligned approximately north-south. Structures 7-9 are also parallel and occur in a second row, also oriented north-south. Structures 5 and 6 are oriented east-west and face the first row of structures. In addition there is a depression 10 m south of the second row of structures which may represent an outhouse.

The sizes of these structures vary from 4 x 6 to 11 x 36 m. The mounded earthen embankments at the site were quite clear, and were ca 40-70 cm high. Within a few of the structures, milled lumber boards were partially intact. In the southwest area of the point is a large clearing which was certainly a component of the lumber camp. No structures were located in this clearing. Considerable historic artifact debris was scattered across the site area, mostly in the form of metal cans and scrap. Several small accumulations of cans were recorded in the area between structures 4, 5 and 7.



APPENDIX 5

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Figure 12. Virginia and Rainy Lake Camp #35, visible at clearing along Hammer Bay.

Table 2. Visible structures, Virginia & Rainy Lake Camp #137.

Structure #1	Size*	Orientation	Comments
1	17 x 9m	NW/SE	door at both ends
2	13 x 9m	NW/SE	door at both ends
3	13 x 8m	NW/SE	door at both ends
4	17 x 9m	NW/SE	door at both ends
5	11 x 36m	NE/SW	horse barn?
6	ca 4 x 6m	NW/SE	embankments eroded and not clear on north and west walls
7	9 x 6m	NW/SE	no apparent door openings
8	9 x 6m	NW/SE	no apparent door openings
9	6 x 7m	NW/SE	no apparent door openings

* size of structures is based upon well preserved earthen embankments at each of the former structural locations.

The single artifact collected from the site is a complete, clear glass pint bottle. This liquor flask is machine-made as evidenced by the combination of mold seams on the base, neck and finish portions of the vessel. The bottle exhibits a "brandy" style finish.

When combined with the other Virginia & Rainy Lake lumber camps in the Park, this site has considerable research and interpretive potential. Camp #137 is in excellent condition, and in situ subsurface cultural deposits are certainly present.

Virginia & Rainy Lake Logging Camp #35 (21SL60). This extremely well preserved logging camp is located in Hammer Bay of Namakan Lake. Located a short distance west of the National Park Service's Sand Bar Point campground, the site has not suffered from disturbance factors seen at several of the other logging camps, and remains in nearly pristine condition. The site faces south into Hammer Bay and is well protected from wave action from the lake since it is set in several meters from the shore (Figure 11). Dense forest growth masks the structural remains from view. These combined factors have apparently protected the site from surface collection as evidenced by the presence of unbroken glass bottles and other artifacts on the surface of the ground.

Camp #35 is one of the older Virginia and Rainy Lake logging camps in St. Louis County, operating from August 1914 to September 1915. An impressive amount of logs containing 9,607,910 board feet were cut by workers from this camp. Evidence of nine complete structural foundations and a portion of a tenth was recorded during site mapping, in addition to the presence of an irregularly shaped clearing. The area of the site encompassing the structural remains is ca. 125 x 50, while the site area including the clearing is considerably larger (Figure 12).

Structure #10. This structure was marked only by the presence of a single 10 m long linear earthen embankment. No other embankments were visible in the area. Since no excavations were undertaken in this area, the shape and extent of this structure remains unknown.

Field methods at V & RL logging camp #35 consisted of mapping, selective surface collection of artifacts, and limited test excavation. Mapping was difficult at the site due to dense forest cover. Mapping was accomplished with a Brunton compass and tape. Several artifacts were exposed on the surface of the site, in and around the mounded earthen embankments. Metal scrap was most numerous, but glass bottles were also present. One complete bottle was collected from an area adjacent to the west wall of structure 1. This is a complete, clear glass quart liquor bottle. The clear glass has developed a pale purple tint, probably due to the presence of magnesium in the "batch" used to produce the bottle. The bottle is machine-made, as evidenced by the combination of seams and the presence of off-center suction valve marks on the base. The embossed number "85" is present on the heel of the bottle, and the maker's mark "B" is embossed at the center of the base. The bottle has a "brandy" type finish. The bottle was probably made by the Brockway Machine Bottle Co., which operated under that name between 1907-1933 at Brockwayville, Pennsylvania (Toulouse 1971:58-59).

No shovel testing was undertaken at the site, but two small test pits were excavated to determine the structure of the earthen embankments. A few artifacts were located during this testing. A .50 x 1 m test pit was excavated across a mounded embankment of structure 1. At a depth of ca. 30 cm, partially rotted boards were encountered. It appeared that these boards represented decomposed floorboards and wall from the structure. Stratigraphy from the test unit revealed that the boards were placed upon the original ground surface, and that the mound was built up against them. Artifacts from this test unit were limited to a wire nail and scraps of wire.

A second test unit was excavated across the northeast embankment of structure #3. This unit was excavated to a depth of ca 45 cm. Similar to test unit 1, rotted wood boards were encountered near the bottom of the excavation. Structure #3 was unusual in that a deep (1 m) depression is present in the center of the structure. This depression was partially filled with leaves and other loose organic material. We raked the leaves out of the depression, and found several artifacts in the loose sand at the bottom of the depression. The depression may represent an artifact collector's "pot" hole, but this interpretation is uncertain. It is not the result of recent digging, since it has filled in with leaves and other materials. It may represent a logging era feature.

No artifacts were recovered from the small test pit at structure 1, but several objects were found in trench 1 and while exposing the depression at structure 3. Glass and metal artifacts were found in trench 1 at structure 3. These included: a wire nail, 4 wire fragments, 3/4" nut, horseshoe nail, milkglass lid insert for a canning jar and a flat glass (window pane?) fragment. Metal was the only media represented in artifacts from the structure 3 depression: a small iron cap, iron ring, pulley, a wire nail fragment, a cast iron stove fragment, and several flat metal fragments.

The total size of Virginia & Rainy Lake logging camp #35 is not known, but an area 125 x 50 m encompasses all 10 structures. Certainly the total area of the camp would have been considerably larger. Unlike many of the other logging camp locations, considerable flat area was available for the layout of this camp, yet most of the structures were tightly clustered, just as they were at camps where the total area available for construction was considerably smaller. The camp appears to have been carefully planned, with the compass orientation closely adhered to except for the two smallest structures at the site. The relatively early age of this camp combined with its well preserved condition give the site considerable research potential.

APPENDIX 6: TERMS USED IN LOGGING

This glossary of logging terms was published in *Logging: The Principles and General Methods of Operation in the United States* by Ralph Clement Bryant, Manufacturers' Association Professor of Lumbering, Yale University (New York: John Wiley and Sons, Inc., 1913, 1923).

[Letters in parentheses following definitions indicate the forest regions (see Fig. 1) in which the terms as defined are used.

(Gen.) = General = In all forest regions of the United States.
(C. H. F.) = Central Hardwood Forest.
(N. F.) = Northern Forest.
(App.) = Appalachian Forest.
(L. S.) = Lake States Forest.
(N. W.) = North Woods.
(S. F.) = Southern Forest.
(R. M. F.) = Rocky Mountain Forest.
(P. C. F.) = Pacific Coast Forest.

[In a few instances very local terms are ascribed to a State instead of to a forest region.]

Alder grab. The stem of an alder, or other small tree, which is bent over and plugged into a hole bored in a boom stick, or secured in some other way, to hold a boom or logs inshore. (N. F.)

Alligator, n. 1. A boat used in handling floating logs. It can be moved overland from one body of water to another by its own power, usually applied through drum and cable. (N. W., L. S.)

2. A device, often made from the fork of a tree, on which the front end of a log is placed to facilitate skidding on swampy ground. (S. F.)

Anchor line. A line attached to a small buoy and to one fluke of an anchor used in towing a raft of logs. It is employed to free the anchor when fast to rocks or snags. (N. F.)

Apron, n. 1. A platform projecting downstream from the sluiceway of a dam to launch well into the stream logs which pass through the sluiceway. (Gen.)

2. A platform built of timbers at the foot of a slide, which guides in the desired direction logs leaving the slide. (Gen.)

Ark, n. See Wanigan.

Back line. See Haul back.

Ballhooter, n. One who rolls logs down a hillside. (App.)

Bank, v. See Bank up, to.

Bank, n. 1. See Landing.

2. The logs cut or skidded in one day above the required amount and held over by the saw crew or skidders, to be reported when the required daily number is not reached. (N. F.)

¹ From Terms Used in Forestry and Logging, Bul. 61, U. S. Bureau of Forestry, Washington, 1905.

Banking ground. *See* Landing.
Bank up, to. To pile up logs on a landing. (Gen.)
 Syn.: bank.
Barker, n. One who peels bark in gathering tanbark. (Gen.)
 Syn.: peeler, spudder.
Barking iron. *See* Spud.
Bark mark. A symbol chopped into the side of a log to indicate its ownership; when used with the end mark it serves as an additional means of identification. (Gen.) *See* Mark.
 Syn.: side mark. (N. F.)
Bark marker. One who cuts the bark mark on logs. (Gen.)
Barn boss. One who has charge of the stables in a logging camp. (Gen.)
 Syn.: feeder. (N. W.)
Batten, n. A log less than 11 inches in diameter at the small end. (Maine.)
Battery, n. Two or more donkey engines for dragging logs, set at intervals on a long skid road. (P. C. F.)
Beaver, n. *See* Swamper.
Becket, n. A large hook used in loading logs on cars by means of tackle. (P. C. F.)
Bed a tree, to. To level up the path in which a tree is to fall, so that it may not be shattered. (P. C. F.)
Bicycle, n. A traveling block, used on a cable in steam skidding. (S. F.)
Bigness scale. *See* Full scale.
Big Wheels. *See* Logging wheels.
Binder, n. A springy pole used to tighten a binding chain. (Gen.)
 Syn.: jim binder.
Binding chain. A chain used to bind together a load of logs. (Gen.)
 Syn.: wrapper chain. (N. F.)
Binding Logs. Logs placed on the top of the chain binding a load, in order to take up the slack. (Gen.)
Birl, n. To cause a floating log to rotate rapidly by treading upon it. (Gen.)
Bitch chain. A short, heavy chain with hook and ring, used to fasten the lower end of a gin pole to a sled or car when loading logs. (N. F.)
Blaze, v. To mark, by cutting into trees, the course of a boundary, road, trail or the like. (Gen.)
 Syn.: spot. (N. W.)
Block, n. *See* Brail.
Blow down. *See* Windfall.
Blue jay. *See* Road monkey.
Bluing, n. The result of fungus attack, which turns the sapwood of certain trees blue. (Gen.)
Bob, n. *See* Dray.
Bobber, n. *See* Deadhead.
Bob logs, to. To transport logs on a bob or dray. (N. F.)

Body wood. Cord wood cut from those portions of the stem of trees which are clear of branches. (N. F.)
Bolster, n. *See* Bunk.
Boom, n. Logs or timbers fastened together end to end and used to hold floating logs. The term sometimes includes the logs inclosed, as a boom of logs. (Gen.)
Boomage, n. Toll for use of a boom. (Gen.)
Boom buoy. *See* Boom stay.
Boom chain. A short chain which fastens boom sticks end to end. (Gen.)
Boom company. A corporation engaged in handling floating logs, and owning booms and booming privileges. (N. F.)
Boom pin. A wooden plug used to fasten to boom sticks the chain, rope, or withe which holds them together. (Gen.)
Boom rat. One who works on a boom. (N. F.)
Boom stay. A heavy weight used to anchor booms in deep water; its position is indicated by a pole or float attached to it. (N. F.)
 Syn.: boom buoy.
Boom stick. A timber which forms part of a boom. (Gen.)
Bottle butted. *See* Swell butted.
Bottom sill. *See* Mudsill.
Brail, v. To fasten logs in brails.
Brail, n. A section of a log raft, six of which make an average tow. (L. S.)
 Syn.: block. (S. F.)
Brake sled. A logging sled so constructed that, when the pole team holds back, a heavy iron on the side of each runner of the forward sled is forced into the roadbed. (N. F.)
Brand, n. *See* Mark.
Break out, to. 1. To start a sled whose runners are frozen to the ground. (N. W., L. S.)
 2. To open a logging road after heavy snowfall. (N. W., L. S.)
Breastwork log. *See* Fender skid.
Briar, n. A crosscut saw. (Gen.)
Bridle, n. A device for controlling the speed of logs on a skid road. It consists of a short rope with two hooks at one end, which are driven into the first log of the turn; at the other end is a clamp which runs over the cable. (P. C. F.)
Bridle man. One who follows a turn of logs down the skid road and tends the "bridle." (P. C. F.)
Broadleaf, a. *See* Hardwood.
Brow skid. The chief beam in a frame to which tackle for loading logs on cars is fastened. (P. C. F.)
 Syn.: draw skid, lead log.
Brush a road, to. To cover with brush the mudholes and swampy places in a logging road, to make it solid. (N. F.)

Brush snow fence. A snowbreak to protect a logging road; used most commonly on wide marshes. It consists of brush which is set upright in the ground before it freezes. (N. F.)

Brutting crew. A crew which rolls logs down slopes too steep for teams. (App.)

Buck, v. 1. To saw felled trees into logs. (P. C. F.)

2. To bring or carry, as to buck water or wood. (Gen.)

Bucker, n. 1. One who saws felled trees into logs. (P. C. F.)

Syn.: cross cutter.

2. One who brings or carries. See *Bück*.

Buckwheat, v. See *Hang up, to*.

Buckwheater, n. A novice at lumbering. (Gen.)

Bull chain. 1. A very heavy chain, to which a number of short chains, with hooks on one end and dogs on the other, are attached. It is used to draw logs from the mill pond up the gangway. (Gen.)

2. See *Jack chain*.

Bull cook. See *Chore boy*.

Bull donkey. A large donkey engine which, by drum and cable, drags logs from the place where they are yarded to a landing. (P. C. F.)

Bully, n. A common name for the foreman or boss of a logging camp. (N. F.)

Bummer, n. A small truck with two low wheels and a long pole, used in skidding logs. (N. F., S. F.)

Syn.: drag cart, skidder.

Bunch load, to. To encircle several logs with a chain and load them at once, by steam or horse power. (N. F.)

Bunch logs, to. To collect logs in one place for loading. (Gen.)

Bunk, v. To place upon the bunks, as to "bunk a log." (Gen.)

Bunk, n. 1. The heavy timber upon which the logs rest on a logging sled. (N. F.)

Syn.: bolster.

2. The cross beam on a log car or truck, on which the logs rest. (Gen.)

3. A log car or truck. (S. F., P. C. F.)

Bunk chain. See *Toggle chain*.

Bunk hook. The hook attached to the end of the bunk on a logging car, which may be raised to hold the logs in place or lowered to release them. (Gen.)

Bunk load. A load of logs not over one log deep; *i.e.*, in which every log rests on the bunks. (Gen.)

Bunk spikes. Sharp spikes set upright in the bunks of a logging sled to hold the logs in place. (N. F.)

Bush a road, to. To mark the route of a logging road across a marsh or the ice by setting up bushes. (N. F.)

Butt, n. The base of a tree, or the big end of a log. (Gen.)

Butt cut. 1. The first log above the stump. (Gen.)

Syn.: butt log. (Gen.)

2. In gathering tanbark, the section of bark taken from the butt of a tree before felling it for further peeling. (N. F.)

Butt hook. The hook by which the cable is attached to the tackle on the logs. (P. C. F.)

Butt log. See *Butt cut*.

Butt off, to. 1. To cut a piece from the end of a log on account of a defect. (Gen.)

Syn.: long butt, to. (P. C. F., App.)

2. To square the end of a log. (N. F.)

Buttress, n. A wall or abutment built along a stream to prevent the logs in a drive from cutting the bank or jamming. (Gen.)

Butt team. In a logging team of four or more, the pair nearest the load. (Gen.)

Camp inspector. A lazy lumberjack, who goes from one logging camp to another, working only a short time in each. (N. F.)

Cannon a log, to. In loading logs by steam or horse power, to send up a log so that it swings crosswise, instead of parallel to the load. (N. F.)

Cant dog. See *Cant hook*.

Cant hook. A tool like a peavey, but having a toe ring and lip at the end instead of a pike. See *Peavey*. (Gen.)

Syn.: cant dog.

Cap, n. A cone of sheet iron or steel, with a hole in the end through which a chain passes, which is fitted over the end of a log before snaking it, to prevent catching on stumps, roots or other obstacles, in steam skidding. (S. F.)

Catamaran, n. A small raft carrying a windlass and grapple, used to recover sunken logs. (Gen.)

Syn.: sinker boat (Gen.), monitor, pontoon (P. C. F.)

Catch boom. A boom fastened across stream to catch and hold floating logs. (Gen.)

Catface, n. A partly healed over fire scar on the stem of a tree. (P. C. F.)

Catpiece, n. A small stick in which holes are made at regular intervals, placed on the top of uprights firmly set in floating booms. The uprights are fitted to enter the holes in the catpiece, so as to narrow or widen the space between the booms at the entrance to a sluiceway or sorting jack. The catpiece is held by the uprights high enough above water to allow logs to float freely under it. (N. W., L. S.)

Cattyman, n. An expert river driver. (N. F.)

Center jam. A jam formed on an obstacle in the middle of a stream, and which does not reach either shore. (Gen.)

Syn.: stream jam.

Chain grapples. See Grapples.
Chain tender. See Sled tender.
Check, n. A longitudinal crack in timber caused by too rapid seasoning. (Gen.)
 Syn.: season check.
Cheese block. See Chock block.
Chock block. A small wedge or block used to prevent a log from rolling. (Gen.)
 Syn.: cheese block. (P. C. F.)
Choker, n. A noose of wire rope by which a log is dragged. (P. C. F.)
Choker man. The member of a yarding crew who fastens the choker on the logs. (P. C. F.)
Chopper, n. See Faller.
Chore boy. One who cleans up the sleeping quarters and stable in a logging camp, cuts firewood, builds fires and carries water. (Gen.)
 Syn.: bull cook, flunkey, shanty boss.
Chunk, v. To clear the ground, with engine or horses, of obstructions which cannot be removed by hand. (P. C. F.)
Chunk up, to. To collect and pile for burning the slash left after logging. (N. W., L. S.)
Churn butted. See Swell butted.
Chute, n. See Slide.
Coal off, to. To cut a forest clean for charcoal wood. (N. F.)
Commissary, n. A general store for supplying lumbermen. (App., S. F.)
 See Van.
Conk, n. 1. The decay in the wood of trees caused by a fungus. (N. F., P. C. F.)
 2. The visible fruiting organ of a tree fungus. (N. F., P. C. F.)
Conky, a. Affected by conk. (N. F., P. C. F.)
Cook camp. The building used as kitchen and dining room in a logging camp. (Gen.)
 Syn.: cook house, cook shanty.
Cooke, n. Assistant cook and dishwasher in a logging camp. (Gen.)
Cook house. See Cook camp.
Cook shanty. See Cook camp.
Corkscrew, n. A geared logging locomotive. (P. C. F.)
 Syn.: stem-winder. (App.)
Corner binds. Four stout chains, used on logging sleds, to bind the two outside logs of the lower tier to the bunks, and thus give a firm bottom to the load. (N. F.)
Corner man. In building a camp or barn of logs, one who notches the logs so that they will fit closely and make a square corner. (N. F.)
Coupling grab. See Grapples.

Crab, n. A small raft bearing a windlass and anchor, used to move log rafts upstream or across a lake. (N. F., S. F.)
Cradle, n. A framework of timbers in which ocean-going rafts of logs are built. (P. C. F.)
Cradle knolls. Small knolls which require grading in the construction of logging roads. (N. W., L. S.)
Crazy chain. The short chain used to hold up that tongue of a sprinkler sled which is not in use. (N. F.)
Crib, n. Specifically, a raft of logs; loosely applied to a boom of logs. (N. F.)
Crib logs, to. To surround floating logs with a boom and draw them by a windlass on a raft (a *crab*), or to tow them with a steamboat. (N. W., L. S.)
Cross chains. Chains connecting the front and rear sleds of a logging sled. (N. F.)
Cross cutter. See Bucker.
Cross haul. The cleared space in which a team moves in cross hauling. (N. F.)
Cross haul, to. To load cars or sleds with logs by horse power and crotch or loading chain. (Gen.)
Crotch, v. To cut notches on opposite sides of a log near the end, into which dogs are fastened. (P. C. F.)
Crotch, n. See Dray.
Crotch chain. A tackle for loading logs on sleds, cars or skidways by cross hauling. (Gen.)
Crotch tongue. Two pieces of wood, in the form of a V, joining the front and rear sleds of a logging sled. (N. W., L. S.)
Cruise, v. To estimate the amount and value of standing timber. (Gen.)
 Syn.: estimate, value.
Cruiser, n. One who cruises. (Gen.)
 Syn.: estimator, land looker, valuer.
Cull, n. Logs which are rejected, or parts of logs deducted in measurement on account of defects. (Gen.)
Cut, n. A season's output of logs. (Gen.)
Cut a log, to. To move one end of a log forward or backward, so that the log will roll in the desired direction. (Gen.)
Cut-off. An artificial channel by which the course of a stream is straightened to facilitate log driving. (N. F.)
Deacon seat. The bench in front of the sleeping bunks in a logging camp. (N. F.)
Deadener, n. A heavy log or timber, with spikes set in the butt end, so fastened in a log slide that the logs passing under it come in contact with the spikes and have their speed retarded. (Gen.)

Deadhead, n. A sunken or partly sunken log. (Gen.)
 Syn.: sinker (Gen.), bobber (N. F.)

Deadman, n. A fallen tree on the shore, or a timber to which the hawser of a boom is attached. (N. F., P. C. F.)

Deadwater. See Stillwater.

Decker, n. One who rolls logs upon a skidway or log deck. (Gen.)

Decking chain. See Loading chain.

Deck up, to. To pile logs upon a skidway. (Gen.)

Deer foot. A V-shaped iron catch on the side of a logging car, in which the binding chain is fastened. (Gen.)

Dehorn, v. To saw off the ends of logs bearing the owner's mark and put on a new mark. (Kentucky.)

Dingle, n. The roofed-over space between the kitchen and the sleeping quarters in a logging camp, commonly used as a storeroom. (N. W., L. S.)

Dinkey, n. A small logging locomotive. (App., S. F.)

Dog, n. A short, heavy piece of steel, bent and pointed at one end and with an eye or ring at the other. It is used for many purposes in logging, and is sometimes so shaped that a blow directly against the line of draft will loosen it. (Gen.)
 Syn.: tail hook. (P. C. F.)

Dog boat. See Rigging sled.

Dogger, n. One who attaches the dogs or hooks to a log before it is steam skidded. (S. F., P. C. F.)

Dog hook. 1. The strong hook on the end of a dogwarp. (N. F.)
 2. A hook on the end of a haul-up chain of a size to permit its being hooked into a link of the chain when the latter is looped around a log or other object. (P. C. F.)

Dogs, n. See Skidding tongs.

Dogwarp, n. A rope with a strong hook on the end, which is used in breaking dangerous jams on falls and rapids and in moving logs from other difficult positions. (N. F.)

Dog wedge. An iron wedge with a ring in the butt, which is driven into the end of a log and a chain hitched in the ring for skidding the log by horse power; also used in gathering up logs on a drive by running a rope through the rings and pulling a number of logs at a time through marshes or partially submerged meadows to the channel. (N. F.)

Dolly, n. See Upright roller.

Dolphin, n. A cluster of piles to which a boom is secured. (P. C. F.)

Donkey, n. A portable steam engine, equipped with drum and cable, used in steam logging. See Road donkey; Yarding donkey; Bull donkey; Spool donkey. (P. C. F.)

Donkey sled. The heavy sled-like frame upon which a donkey engine is fastened. (P. C. F.)

Dote, n. The general term used by lumbermen to denote decay or rot in timber. (Gen.)

Doty, a. Decayed. (Gen.)
 Syn.: dozy.

Double couplers. Two coupling grabs joined by a short cable, used for fastening logs together. (P. C. F.)
 Syn.: four paws.

Double header. A place from which it is possible to haul a full load of logs to the landing, and where partial loads are topped out or finished to the full hauling capacity of teams. (N. W., L. S.)

Down-hill clevis. A brake on a logging sled, consisting of a clevis encircling the runner, to the bottom of which a heavy square piece of iron is welded. (N. F.)

Dozy, a. See Doty.

Drag cart. See Bummer.

Drag in, to. See Dray in, to.

Drag road. See Dray road; Gutter road.

Drag sled. See Dray.

Draw hook. See Gooseneck.

Draw skid. See Brow skid.

Dray, n. A single sled used in dragging logs. One end of the log rests upon the sled. (N. F.)
 Syn.: bob, crotch, drag sled, go-devil, lizard, scoot, skidding sled, sloop, travois.

Dray in, to. To drag logs from the place where they are cut directly to the skidway or landing. (N. F.)
 Syn.: drag in, to.

Dray road. A narrow road, cut wide enough to allow the passage of a team and dray. (N. F.)
 Syn.: drag road.

Drive, v. To float logs or timbers from the forest to the mill or shipping point. (Gen.)
 Syn.: float.

Drive, n. 1. A body of logs or timbers in process of being floated from the forest to the mill or shipping point. (Gen.)
 2. That part of logging which consists in floating logs or timbers. (Gen.)

Drum logs, to. To haul logs by drum and cable out of a hollow or cove. (App.)

Dry-ki, n. Trees killed by flooding. (N. F.)

Dry pick, to. As applied to a jam, to remove logs singly while the water is cut off. (N. F.)

Dry roll, to. In sacking the rear, to roll stranded logs into the bed of the stream from which the water has been cut off preparatory to flooding. (N. F.)

Dry rot. Decay in timber without apparent moisture. (Gen.)

Dry slide. See Slide.

Dry sloop, to. To sloop logs on bare ground when the slope is so steep that it would be dangerous to sloop on snow. (N. F.)

Dudler, n. See Dudley.

Dudley, n. An engine for hauling logs, which propels itself and drags its load by revolving a large spool around which are several turns of a cable fixed at each end of the track. (P. C. F.)
Syn.: dudler.

Duffle, n. The personal belongings of a woodsman or lumberjack which he takes into the woods. (Gen.)
Syn.: dunnage. (N. W.)

Dump hook. A levered chain grab hook attached to the evener to which a team is hitched in loading logs. A movement of the lever releases the hook from the logging chain without stopping the team. (N. F.)

Dump logs, to. To roll logs over a bluff, or from a logging car or sled into the water. (Gen.)

Dunnage, n. See Duffle.

Dust a dam, to. To fill up with earth or gravel the cracks or small holes between planks in the gate of a splash dam. (N. W.)

Dutchman, n. A short stick placed transversely between the outer logs of a load to divert the load toward the middle and so keep any logs from falling off. (N. F.)

End mark. See Mark.

Estimate, v. See Cruise.

Estimator, n. See Cruiser.

Face log. See Head log.

Faller, n. One who fells trees. (Gen.) See Head faller; Second faller.
Syn.: sawyer (Gen.), chopper (App.)

Falling ax. An ax with a long helve and a long, narrow bit, designed especially for felling trees. (Gen.)

Falling wedge. A wedge used to throw a tree in the desired direction, by driving it into the saw kerf. (Gen.)

Feeder, n. See Barn boss.

Fender boom. See Sheer boom.

Fender skid. A skid placed on the lower side of a skidding trail on a slope to hold the log on the trail while being skidded. (Gen.)
Syn.: breastwork log, glancer, sheer skid.

Fid hook. A slender, flat hook used to keep another hook from slipping on a chain. (N. W., L. S.)

Filer, n. One who files the crosscut saws in the woods. (Gen.)
Syn.: saw fitter.

Fitter, n. 1. One who notches the tree for felling and after it is felled marks the log lengths into which it is to be cut. (N. F.)

2. One who cuts limbs from felled trees and rings and slits the bark preparatory to peeling tanbark. (N. F.)

Float, v. See Drive.

Float road. A channel cleared in a swamp and used to float cypress logs from the woods to the boom at the river or mill. (S. F.)

Flood, v. See Splash.

Flood dam. See Splash dam.

Flume, n. To transport logs or timbers by a flume. (Gen.)
Syn.: sluice.

Flume, n. An inclined trough in which water runs, used in transporting logs or timbers. (Gen.)
Syn.: sluice, water slide, wet slide.

Flunkey, n. 1. An assistant, usually either to the engineer of a donkey engine or to the cook in a logging camp. (P. C. F.)
2. See Chore boy.

Flying drive. A drive the main portion of which is put through with the utmost dispatch, without stopping to pick rear. (N. F.)

Fly rollway. A skidway or landing on a steep slope, from which the logs are released at once by removing the brace which holds them. (N. F.)

Fore-and-aft road. A skid road made of logs placed parallel to its direction, making the road resemble a chute. (P. C. F.)
Syn.: stringer road.

Four paws. See Double couplers.

Frog, n. 1. The junction of two branches of a flume. (P. C. F.)
2. A timber placed at the mouth of a slide to direct the discharge of the logs. (Gen.) Syn.: throw out.

Full scale. Measurement of logs, in which no reduction is made for defects. (Gen.)
Syn.: bigness scale. (N. F.)

Gangway, n. The incline plane up which logs are moved from the water into a sawmill. (Gen.)
Syn.: jack ladder, log jack, log way, slip.

Gap stick. The pole placed across the entrance of a sorting jack to close it, when not in use. (Gen.)

Gee throw. A heavy, wooden lever, with a curved iron point, used to break out logging sleds. (N. F.)
Syn.: starting bar.

Gin pole. A pole secured by guy ropes, to the top of which tackle for loading logs is fastened. (Gen.)

Glancer, n. See Fender skid.

Glancing boom. See Sheer boom.

Glisse skids. Freshly peeled skids up which logs are slid instead of rolled when being loaded. (N. F.)
Syn.: slip skids.

Go-back road. A road upon which unloaded logging sleds can return to the skidways for reloading, without meeting the loaded sleds en route to the landing. (N. F.)

Syn.: short road.

Go-devil. *See* Dray.

Gooseneck, n. 1. A wooden bar used to couple two logging trucks. (Gen.)

Syn.: rooster. (P. C. F.)

2. The point of draft on a logging sled; it consists of a curved iron hook bolted to the roll. (N. F.)

Syn.: draw hook.

3. A curved iron driven into the bottom of a slide to check the speed of descending logs. (App.)

Goosepen. A large hole burned in a standing tree. (P. C. F.)

Grab hook. A hook having a narrow throat, adapted to grasp any link of a chain. (Gen.)

Grab link. *See* Slip grab.

Grabs, n. *See* Skidding tongs.

Grab skipper. A short iron pry or hammer, used to remove the skidding tongs from a log. (App., S. F.)

Grapples, n. 1. Two small iron dogs joined by a short chain, and used to couple logs end to end when skidding on mountains, so that several logs may be skidded by one horse at the same time. (N. F.)

Syn.: chain grapples, coupling grab. (P. C. F.)

2. *See* Skidding tongs.

Gravel a dam, to. To cover with gravel or earth the upstream side of the timber work of a dam, to make it water tight. (N. F.)

Greaser, n. *See* Road monkey.

Grips, n. *See* Skidding tongs.

Ground loader. *See* Send-up man.

Grouser, n. A large and long stick of squared timber sharpened at the lower end and placed in the bow of a steam logging boat; it takes the place of an anchor in shallow water, and can be raised or lowered by steam power. (N. W., L. S.)

Guard a hill, to. To keep a logging road on a steep decline in condition for use. (N. F.)

Gun, v. To aim a tree in felling it. In the case of very large, brittle trees, such as redwood, a sighting device (gunning stick) is used. (P. C. F.)

Syn.: point, swing. (Gen.)

Gunning stick. *See* Gun.

Gutterman. *See* Swamper.

Gutter road. The path followed in skidding logs. (Gen.)

Syn.: drag road, runway, skidding trail, snaking trail.

Handbarrow. Two strong, light poles held in position by rungs, upon which bark or wood is carried by two men. (N. W., L. S.)

Syn.: ranking bar.

Hand pike. A piked lever, usually from 6 to 8 feet long, for handling floating logs. (Gen.)

Hand skidder. One who accompanies a log as it is being dragged and places short skids beneath it. (P. C. F.)

Hang the boom, to. To put the boom in place. (Gen.)

Hang up, to. 1. To fell a tree so that it catches against another instead of falling to the ground. (Gen.)

Syn.: lodge (Gen.), buckwheat (App.)

2. As applied to river driving, to discontinue; thus a drive may be "hung up" for lack of water or for some other reason.

Hardwood, a. As applied to trees and logs, broadleaved, belonging to the dicotyledons. (Gen.)

Syn.: broadleaf.

Hardwood, n. A broadleaved, or dicotyledonous, tree. (Gen.)

Haul, n. In logging, the distance and route over which teams must go between two given points, as between the yard or skidway and the landing. (Gen.)

Haul back. A small wire rope, traveling between the donkey engine and a pulley set near the logs to be dragged, used to return the cable. (P. C. F.)

Syn.: back line, pull back, trip line.

Haul up. A light chain and hook by which a horse may be hitched to a cable in order to move it where desired. (P. C. F.)

Hay road. *See* Tote road.

Hay wire outfit. A contemptuous term for loggers with poor logging equipment. (N. F.)

Head block. The log placed under the front end of the skids in a skidway to raise them to the desired height. (N. F.)

Head driver. An expert river driver who, during the drive, is stationed at a point where a jam is feared. Head drivers usually work in pairs. (N. F.)

Syn.: log watch (N. F.), jam cracker (P. C. F.)

Head faller. The chief of a crew of fallers. (P. C. F.)

Head log. 1. The front bottom log on a skidway. (N. F.)

Syn.: face log.

2. The front log in a turn. (P. C. F.)

Syn.: lead log.

Head push. *See* Straw boss.

Headquarters, n. In logging, the distributing point for supplies, equipment and mail; not usually the executive or administrative center. (Gen.)

Head tree. In steam skidding, the tree to which the cable upon which the traveler runs is attached. (S. F.)

Headworks, n. A platform or raft, with windlass or capstan, which is attached to the front of a log raft or boom of logs, for warping, kedging or winding it through lakes and still water, by hand or horse power. (N. W., L. S.)

Helper, n. See Second faller.

Hoist, n. See Loading tripod.

Holding boom. See Storage boom.

Hook tender. The foreman of a yarding crew; specifically, one who directs the attaching of the cable to a turn of logs. (P. C. F.)

Horse dam. A temporary dam made by placing large logs across a stream, in order to raise the water behind it, so as to float the rear. (N. F.)

Horse logs, to. In river driving, to drag stranded logs back to the stream by the use of peaveys. (N. F.)

Hovel, n. A stable for logging teams. (N. W., L. S.)

Ice a road, to. To sprinkle water on a logging road so that a coating of ice may form, thus facilitating the hauling of logs. (N. F.)

Ice guards. Heavy timbers fastened fan shaped about a cluster of boom piles at an angle of approximately 30 degrees to the surface of the water. They prevent the destruction of the boom by ice, through forcing it to mount the guards and be broken up. (N. F.)

Jack chain. An endless spiked chain, which moves logs from one point to another, usually from the mill pond into the sawmill. (Gen.)
Syn.: bull chain. (P. C. F.)

Jack ladder. See Gangway.

Jackpot, n. 1. A contemptuous expression applied to an unskillful piece of work in logging. (N. F.)
2. An irregular pile of logs. (App.)

Jam, n. A stoppage or congestion of logs in a stream, due to an obstruction or to low water. (Gen.)

Jam cracker. See Head driver.

Jammer, n. An improved form of gin, mounted on a movable framework, and used to load logs on sleds and cars by horse power. (N. F.)

Jam, to break a. To start in motion logs which have jammed. (Gen.)

Jay hawk, to. To strip one 4-foot length of bark from a tanbark oak, leaving the tree standing. (P. C. F.)

Jiboo, v. To remove a dog from a log. (N. W., L. S.)

Jigger, v. To pull a log by horse power over a level place in a slide. (Gen.)
Syn.: lazy haul, to.

Jim binder. See Binder.

Jobber, n. A logging contractor or subcontractor. (Gen.)

Jobber's sun. A term applied to the moon in a jobber's or contractor's logging camp, on account of the early and late hours of commencing and ending work. (N. W., L. S.)

Jumper, n. A sled shod with wood, used for hauling supplies over bare ground into a logging camp. (N. F.)
Syn.: tote sled.

Katydid, n. See Logging wheels.

Key log. In river driving, a log which is so caught or wedged that a jam is formed and held. (Gen.)

Kifbig, n. A short, stout pole used as a lever or brace to direct the fall of a tree. (N. W.)

Knot, v. See Limb.

Knot bumper. See Limber.

Knotter, n. See Limber.

Laker, n. A log driver expert at handling logs on lakes. (N. F.)

Landing, n. 1. A place to which logs are hauled or skidded preparatory to transportation by water or rail. A *rough and tumble landing* is one in which no attempt is made to pile the logs regularly. (Gen.)

Syn.: bank, banking ground, log dump, rollway, yard.

2. A platform, usually at the foot of a skid road, where logs are collected and loaded on cars. A *lightning landing* is one having such an incline that the logs may roll upon the cars without assistance. (Gen.)

Landing man. One who unloads logging sleds at the landing. (N. F.)

Landing, to break a. To roll a pile of logs from a landing or bank into the water. (Gen.)

Land looker. See Cruiser.

Lap, n., or Lapwood, n. Tops left in the woods in logging. (Gen.)

Lash pole. A cross pole which holds logs together in a raft. (Gen.)

Lazy haul, to. See Jigger.

Lead, n. A snatch block with a hook or loop for fastening it to convenient stationary objects, used for guiding the cable by which logs are dragged. (P. C. F.)

Lead line. A wire rope, with an eye at each end, used to anchor the snatch block in setting a lead. (P. C. F.)

Lead log. See Brow skid; Head log.

Lightning landing. See Landing.

Limb, v. To remove the limbs from a felled tree.

Syn.: knot. (P. C. F.)

Limber, n. One who cuts the limbs from felled trees. (Gen.)

Syn.: knotter (P. C. F.), knot bumper (App.).

Line horse. The horse which drags the cable from the yarding engine to the log to which the cable is to be attached. (P. C. F.)

Lizard, n. See Dray.

Loader, n. 1. One who loads logs on sleds or cars. (Gen.)

2. See Steam loader.

Loading chain. A long chain used in loading or piling logs with horses. (N. F.)
 Syn.: decking chain.

Loading jack. A platformed framework upon which logs are hoisted from the water for loading upon cars. (N. F.)

Loading tripod. Three long timbers joined at their tops in the shape of a tripod, for holding a pulley block in proper position to load logs on cars from a lake or stream. (L. S.)
 Syn.: hoist.

Lock down. A strip of tough wood, with holes in the ends, which is laid across a raft of logs. Rafting pins are driven through the holes into the logs, thus holding the raft together. (N. F.)

Lodge, to. See Hang up, to.

Logan, n. See Pokelogan.

Log deck. The platform upon a loading jack. (Gen.)

Log dump. See Landing.

Log fixer. See Rosser.

Logger, n. One engaged in logging.

Logging sled. The heavy double sled used to haul logs from the skidway or yard to the landing. (N. F.)
 Syn.: twin sleds, two sleds, wagon sled.

Logging-sled road. A road, leading from the skidway to the landing. (N. F.)

Logging wheels. A pair of wheels, usually about 10 feet in diameter, for transporting logs. (Gen.)
 Syn.: big wheels, katydid, timber wheels.

Log jack. See Gangway.

Log scale. The contents of a log, or of a number of logs considered collectively. (Gen.)

Log, to. To cut logs and deliver them at a place from which they can be transported by water or rail, or, less frequently, at the mill. (Gen.)

Log wath. See Head driver.

Logway, n. See Gangway.

Long butt, to. See Butt off, to.

Loose-tongued sloop. See Swing dingle.

Lubber lift, to. To raise the end of a log by means of a pry, and through the use of weight instead of strength. (N. F.)

Lug hooks. A pair of tongs attached to the middle of a short bar, and used by two men to carry small logs. (Gen.)

Lumber, v. To log, or to manufacture logs into lumber, or both. (Gen.)

Lumberjack, n. One who works in a logging camp. (Gen.)

Lumberman, n. One engaged in lumbering. (Gen.)

Mark, n. A letter or sign indicating ownership, which is stamped on the ends of logs. (Gen.) See Bark mark.
 Syn.: brand, end mark.

Mark caller. In sorting logs, one who stands at the lower end of the sorting jack and calls the different marks, so that the logs may be guided into the proper channels or pockets. (Gen.)

Marker, n. One who puts the mark on the ends of logs. (Gen.)

Market, n. A log 19 inches in diameter at the small end and 13 feet long. (New York.)
 Syn.: standard.

Marking hammer. A hammer bearing a raised device, which is stamped on logs, to indicate ownership. (Gen.)
 Syn.: marking iron.

Marking iron. See Marking hammer.

Match, v. See Mate.

Mate, v. To place together in a raft logs of similar size. (Gen.)
 Syn.: match.

Mill pond. The pond near a sawmill in which logs to be sawn are held. (Gen.)

Monitor. See Catamaran.

Moss, v. To fill with moss the crevices between the logs in a logging camp. (N. F.)

Mud, v. To fill with soft clay the crevices between the logs in a logging camp. (N. F.)

Mudboat, n. A low sled with wide runners, used for hauling logs in swamps. (S. F., N. F.)

Mudsill, n. The bed piece or bottom timber of a dam which is placed across the stream, usually resting on rocks or in mud. (Gen.)
 Syn.: bottom sill.

Nick, n. See Undercut.

Nose, v. To round off the end of a log in order to make it drag or slip more easily. (Gen.)
 Syn.: snipe.

Notch, v. To make an undercut in a tree preparatory to felling it. (Gen.)
 Syn.: undercut.

Notch, n. See Undercut.

Peaker, n. 1. A load of logs narrowing sharply toward the top, and thus shaped like an inverted V. (Gen.)
 2. The top log of a load. (Gen.)

Peavey, n. A stout lever, from 5 to 7 feet long, fitted at the larger end with a metal socket and pike and a curved steel hook which works on a bolt; used in handling logs, especially in driving. A peavey differs from a cant hook in having a pike instead of a toe ring and lip at the end. (Gen.)

Pecky, a. A term applied to an unsoundness most common in bald cypress. (S. F.)
 Syn.: peggy.

Peeler, *n.* See Barker.

Peggy, *a.* See Pecky.

Pickaroon, *n.* A piked pole fitted with a curved hook, used in holding boats to jams in driving, and for pulling logs from brush and eddies out into the current. (Gen.)

Pick the rear, *to.* See Sack the rear, *to.*

Pier dam. A pier built from the shore, usually slanting downstream, to narrow and deepen the channel, to guide logs past an obstruction, or to throw all the water on one side of an island. (N. F.)

Syn.: wing dam.

Pig, *n.* See Rigging sled.

Pig tail. An iron device driven into trees or stumps to support a wire or small rope. (P. C. F.)

Pike pole. A piked pole, from 12 to 20 feet long, used in river driving. (Gen.)

Pitch pocket. A cavity in wood filled with resin. (P. C. F., R. M. F., S. F.)

Pitch streak. A seam or shake filled with resin. (Gen.)

Plug and knock down. A device for fastening boom sticks together, in the absence of chains. It consists of a withe secured by wooden plugs in holes bored in the booms. (N. F.)

Pocket boom. A boom in which logs are held after they are sorted. (Gen.)

Point, *v.* See Gun.

Pokelogan, *n.* A bay or pocket into which logs may float off during a drive. (N. W., L. S.)

Syn.: logan.

Pond man. One who collects logs in the mill pond and floats them to the gangway. (Gen.)

Pontoon. See Catamaran.

Prize lags. Logs which come to the sorting jack without marks denoting ownership. (N. F.)

Pull back. See Haul back.

Pullboat. A flatboat, carrying a steam skidder or a donkey, used in logging cypress. (S. F.)

Pull the briar, *to.* To use a crosscut saw. (N. F.)

Put in, *to.* In logging, to deliver logs at the landing. (Gen.)

Quickwater, *n.* That part of a stream which has fall enough to create a decided current. (Gen.)

Ant.: stillwater.

Rafter dam. A dam in which long timbers are set on the upstream side at an angle of from 20 to 40 degrees to the water surface. The pressure of the water against the timbers holds the dam solidly against the stream bed. (N. F.)

Syn.: self-loading dam, slant dam.

Ram pike. A tree broken off by wind and with a splintered end on the portion left standing. (N. F.)

Rank, *v.* To haul and pile regularly, as, to *rank* bark or cord wood. (Gen.)

Ranking bar. See Handbarrow.

Ranking jumper. A wood-shod sled upon which tanbark is hauled. (N. F.)

Rave, *n.* A piece of iron or wood which secures the beam to the runners of a logging sled. (N. W., L. S.)

Rear, *n.* The upstream end of a drive; the logs may be either stranded or floating. "Floating rear" comprises those logs which may be floated back into the current; "dry rear," those which must be dragged or rolled back. (Gen.)

Receiving boom. See Storage boom.

Ride, *n.* The side of a log upon which it rests when being dragged. (Gen.)

Ride a log, *to.* To stand on a floating log. (Gen.)

Rigging, *n.* The cables, blocks and hooks used in skidding logs by steam power. (Gen.)

Rigging sled. A sled used to haul hooks and blocks on a skid road. (P. C. F.)

Syn.: dog boat, pig.

Rigging slinger. 1. A member of a yarding crew, whose chief duty is to place chokers or grabs on logs. (P. C. F.)

2. One who attaches the rigging to trees, in steam skidding. (S. F.)

Ring, *n.* A section of tanbark, usually 4 feet long. (N. F.)

Ring rot. Decay in a log, which follows the annual rings more or less closely. (Gen.)

Rise, *n.* The difference in diameter, or taper, between two points in a log. (Gen.)

River boss. The foreman in charge of a log drive. (N. F.)

River driver. One who works on a log drive. (Gen.)

River rat. A log driver whose work is chiefly on the river; contrasted with Laker. (N. F.)

Road donkey. A donkey engine mounted on a heavy sled, which drags logs along a skid road by winding a cable on a drum. It has a second drum for the haul back. (P. C. F.)

Road gang. That portion of the crew of a logging camp who cut out logging roads and keep them in repair. (N. F.)

Road monkey. One whose duty is to keep a logging road in proper condition. (N. W., L. S.)

Syn.: blue jay, greaser. (P. C. F.)

Roll, *n.* The crossbar of a logging sled into which the tongue is set. (N. W., L. S.)

Syn.: roller.

Roller, *n.* See Roll; Upright roller.

Rolling dam. A dam for raising the water in a shallow stream. It has no sluiceways, but a smooth top of timber over which, under a sufficient head of water, logs may slide or roll. (Gen.)

Roll the boom, to. To roll a boom of logs along the shore of a lake against which it is held by wind, by the use of a cable operated by a steamboat or kedge. The cable is attached to the outer side of the boom, hauled up, then attached again, thus propelling the boom by revolving it against the shore when it would be impossible to tow it. (N. W., L. S.)

Rollway, n. See Landing.

Rooster, n. See Gooseneck.

Rosser, n. One who barks and smooths the ride of a log in order that it may slide more easily. (N. F.)
Syn.: log fixer (P. C. F.), slipper, scalper (App.).

Rough and tumble landing. See Landing.

Round timber. Pine trees which have not been turpented. (S. F.)

Round turn. A space at the head of a logging-sled road, in which the sled may be turned round without unhitching the team. (N. F.)

Runner chain. A chain bound loosely around the forward end of the runners of a logging sled as a brake. (N. W., L. S.)

Runner dog. A curved iron attached to a runner of the hind sled of a logging sled, which holds the loaded sled on steep hills by being forced into the bed of the road by any backward movement. (N. F.)

Runway. See Gutter road.

Rutter, n. A form of plow for cutting ruts in a logging road for the runners of the sleds to run in. (N. W., L. S.)

Sack the rear, to. To follow a drive and roll in logs which have lodged or grounded. (Gen.)
Syn.: pick the rear, to.

Sack the slide, to. To return to a slide logs which have jumped out. (Gen.)

Saddle, n. The depression cut in a transverse skid in a skid road to guide the logs which pass over it. (P. C. F.)

Saddiebag, n. As applied to a boom, to catch on an obstruction and double around it. (Gen.)

Sampson, n. An appliance for loosening or starting logs by horse power. It usually consists of a strong, heavy timber and a chain terminating in a heavy swamp hook. The timber is placed upright beside the piece to be moved, the chain fastened around it, and the hook inserted low down on the opposite side. Leverage is then applied by a team hitched to the upper end of the upright timber. (N. F.)

Sampson a tree, to. To direct the fall of a tree by means of a lever and pole. (N. F.)

Sap stain. Discoloration of the sapwood. (Gen.)

Saw fitter. See Filer.

Sawyer, n. See Faller.

Scale book. A book especially designed for recording the contents of scaled logs. (Gen.)

Scaler, n. One who determines the volume of logs. (Gen.)

Scalper, n. See Rosser.

Scoot, n. See Dray.

Season check. See Check.

Second faller. The subordinate in a crew of fallers. (P. C. F.)
Syn.: helper. (N. F.)

Self-loading dam. See Rafter dam.

Send-up man. That member of a loading crew who guides the logs up the skids. (Gen.)
Syn.: ground loader. (N. F.)

Send up, to. In loading, to raise logs up skids with cant hooks, or by steam or horse power. (Gen.)

Setting, n. The temporary station of a portable sawmill, a yarding engine, or other machine used in logging. (Gen.)

Shake, n. A crack in timber, due to frost or wind. (Gen.)
Syn.: windshake.

Shanty boat. See Wanigan.

Shanty boss. See Chore boy.

Sheer boom. A boom so secured that it guides floating logs in the desired direction. (N. F.)
Syn.: fender boom, glancing boom.

Sheer skid. See Fender skid.

Shoot a jam, to. To loosen a log jam with dynamite. (Gen.)

Shore hold. The attachment of the hawser of a raft of logs to an object on the shore. (N. W., L. S.)

Short road. See Go-back road.

Shot holes. Holes made in wood by boring insects. (App.)

Side jam. A jam which has formed on one side of a stream, usually where the logs are forced to the shore at a bend by the current, or where the water is shallow or there are partially submerged rocks. (N. F.)

Side mark. See Bark mark.

Side winner. A tree knocked down unexpectedly by the falling of another. (Gen.)

Signal man. One who transmits orders from the foreman of a yarding crew to the engineer of the yarding donkey. (P. C. F.)

Single out, to. To float logs, usually cypress, one at a time, from the woods to the float road. (S. F.)

Sinker, n. See Deadhead.

Sinker boat. See Catamaran.

Skid, v. 1. To draw logs from the stump to the skidway, landing or mill. (Gen.)
Syn.: snake, twitch.

2. As applied to a road, to reinforce by placing logs or poles across it. (Gen.)
- Skid, n.** A log or pole, commonly used in pairs, upon which logs are handled or piled (Gen.); or the log or pole laid transversely in a skid road (P. C. F.).
- Skidder, n.** 1. One who skids logs. (Gen.)
2. A steam engine, usually operating from a railroad track, which skids logs by means of a cable. (Gen.)
Syn.: steam skidder.
3. The foreman of a crew which constructs skid roads. (P. C. F.)
4. See Bummer.
- Skidding chain.** A heavy chain used in skidding logs. (Gen.)
- Skidding hooks.** See Skidding tongs.
- Skidding sled.** See Dray.
- Skidding tongs.** A pair of hooks attached by links to a ring and used for skidding logs. (Gen.)
Syn.: grips, grapples, grabs, skidding hooks.
- Skidding trail.** See Gutter road.
- Skid grease.** A heavy oil applied to skids to lessen the friction of logs dragged over them. (P. C. F.)
- Skid road.** 1. A road or trail leading from the stump to the skidway or landing. (Gen.)
Syn.: travois road. (N. F.)
2. A road over which logs are dragged, having heavy transverse skids partially sunk in the ground, usually at intervals of about 5 feet. (P. C. F.)
- Skid up, to.** 1. To level or reinforce a logging road by the use of skids. (Gen.)
2. To collect logs and pile them on a skidway. (Gen.)
- Skidway, n.** Two skids laid parallel at right angles to a road, usually raised above the ground at the end nearest the road. Logs are usually piled upon a skidway as they are brought from the stump for loading upon sleds, wagons or cars. (Gen.)
- Skidway, to break a.** To roll piled logs off a skidway. (Gen.)
- Sky hooker.** See Top loader.
- Slack water.** In river driving, the temporary slackening of the current caused by the formation of a jam. (Gen.)
- Slant dam.** See Rafter dam.
- Slash, n.** 1. The debris left after logging, wind or fire. (Gen.)
Syn.: slashing.
2. Forest land which has been logged off and upon which the limbs and tops remain, or which is deep in debris as the result of fire or wind. (Gen.)
- Slashing, n.** See Slash.

- Sled tender.** 1. One who assists in loading and unloading logs or skidding with dray. (N. F.)
Syn.: chain tender.
2. A member of the hauling crew who accompanies the turn of logs to the landing, unhooks the grabs, and sees that they are returned to the yarding engine. (P. C. F.)
- Slide, n.** A trough built of logs or timber, used to transport logs down a slope. (Gen.)
Syn.: chute, dry slide, slip.
- Slide tender.** One who keeps a slide in repair. (Gen.)
- Slip, n.** 1. See Slide.
2. See Gangway.
- Slip grab.** A pear-shaped link attached by a swivel to a skidding evenor or whiffletree, through which the skidding chain is passed. The chain runs freely when the slip grab is held sideways, but catches when the grab is straight. (N. F.)
Syn.: grab link.
- Slipper, n.** See Rosser.
- Slip skids.** See Glisse skids.
- Sloop, n.** See Dray.
- Sloop logs, to.** To haul logs down steep slopes on a dray or sloop equipped with a tongue. (N. F.)
- Slough pig.** Usually a second-rate river driver who is assigned to picking logs out of sloughs in advance of the rear. (N. F.)
- Sluice, v.** 1. See Flume.
2. To float logs through the sluiceway of a splash dam. (N. F.)
3. See Splash.
- Sluice, n.** See Flume.
- Sluice gate.** The gate closing a sluiceway in a splash dam. (Gen.)
- Sluiceway, n.** The opening in a splash dam through which logs pass. (Gen.)
- Snake, v.** See Skid.
- Snaking trail.** See Gutter road.
- Snatch team.** See Tow team.
- Snib, v.** In river driving, to be carried away purposely, but ostensibly by accident, on the first portion of a jam that moves; to ride away from work under guise of being accidentally carried off. (N. W., L. S.)
- Snipe, v.** See Nose.
- Sniper, n.** One who noses logs before they are skidded. (Gen.)
- Snow a road, to.** To cover bare spots in a logging road with snow to facilitate the passage of sleds. (N. F.)
- Snow slide.** A temporary slide on a steep slope, made by dragging a large log through deep snow which is soft or thawing; when frozen solidly, it may be used to slide logs to a point where they can be reached by sleds. (N. W.)

Snub, v. To check, usually by means of a snub line, the speed of logging sleds or logs on steep slopes, or of a log raft. (Gen.)

Softwood, a. As applied to trees and logs, needle-leaved, coniferous. (Gen.)

Softwood, n. A needle-leaved, or coniferous, tree. (Gen.)

Solid jam, r. In river driving, a jam formed solidly and extending from bank to bank of a stream. (N. F.)

2. A drive is said to be "in a solid jam" when the stream is full of logs from the point to which the rear is cleared to the mill, sorting jack or storage boom. (N. F.)

Sorting boom. A strong boom used to guide logs into the sorting jack, to both sides of which it is usually attached. (Gen.)

Sorting gap. See Sorting jack.

Sorting jack. A raft, secured in a stream, through an opening in which logs pass to be sorted by their marks and diverted into pocket booms or the downstream channel. (Gen.)

Syn.: sorting gap.

Spanish windlass. A device for moving heavy objects in logging. It consists of a rope or chain, within a turn of which a lever is inserted and power gained by twisting. (N. F.)

Syn.: twister.

Spiked skid. A skid in which spikes are inserted in order to keep logs from sliding back when being loaded or piled. (Gen.)

Splash, v. To drive logs by releasing a head of water confined by a splash dam. (Gen.)

Syn.: flood, sluice.

Splash boards. Boards placed temporarily on top of a rolling dam to heighten the dam, and thus to increase the head of water available for river driving. (N. F.)

Splash dam. A dam built to store a head of water for driving logs. (Gen.)

Syn.: flood dam. (Gen.)

Split roof. A roof of a logging camp or barn made by laying strips split from straight-grained timber. The strips run from the ridge pole to the eaves, and break the joints with other strips, as in a shingle roof. (N. F.)

Spool donkey. A donkey engine for winding cable, equipped with a spool or capstan, instead of a drum. (P. C. F.)

Spool tender. One who guides the cable on a spool donkey. (P. C. F.)

Spot, v. See Blaze.

Spring board. A short board, shod at one end with an iron calk, which is inserted in a notch cut in a tree, on which the faller stands while felling the tree. (P. C. F., S. F.)

Spring pole, r. A springy pole attached to the tongue of a logging sled and passing over the roll and under the beam, for holding the weight of the tongue off the horses' necks. (N. F.)

2. A device for steadying a crosscut saw, so that one man can use it instead of two. (P. C. F.)

Sprinkler, n. A large wooden tank from which water is sprinkled over logging roads during freezing weather in order to ice the surface. (N. W., L. S.)

Syn.: tank.

Sprinkler sleds. The sleds upon which the sprinkler is mounted. They consist of two sleds whose runners turn up at each end, fastened together by cross chains, and each having a pole, in order that the sprinkler may be hauled in either direction without turning around. (N. F.)

Spud, n. A tool for removing bark. (Gen.)

Syn.: barking iron.

Spudder, n. See Barker.

Stag, v. To cut off trousers at the knee, or boots at the ankle. (N. F., P. C. F.)

Standard, n. See Market.

Starting bar. See Gee throw.

Stay boom. A boom fastened to a main boom and attached upstream to the shore to give added strength to the main boom. (Gen.)

Steam hauler. A geared locomotive used to haul loaded logging sleds over an ice road. It is equipped with a spiked metal belt which runs over sprocket wheels replacing the driving wheels, and is guided by a sled, turned by a steering wheel, upon which the front end rests. (N. F.)

Steam jammer. See Steam loader.

Steam loader. A machine operated by steam and used for loading logs upon cars. (Gen.)

Syn.: loader, steam jammer.

Steam skidder. See Skidder.

Stem winder. See Corkscrew.

Stillwater. That part of a stream having such slight fall that no current is apparent. Ant.: quickwater. (Gen.)

Syn.: deadwater.

Stock logs, to. To deliver boom logs from stump to mill or railroad. (S. F.)

Storage boom. A strong boom used to hold logs in storage at a sawmill. (Gen.)

Syn.: holding boom, receiving boom.

Straw boss, n. A subforeman in a logging camp. (N. W., L. S.)

Syn.: head push.

Stream jam. See Center jam.

Stringer road. See Fore-and-aft road.

Stumpage, n. The value of timber as it stands uncut in the woods; or, in a general sense, the standing timber itself. (Gen.)

Swamp, v. To clear the ground of underbrush, fallen trees and other obstructions preparatory to constructing a logging road or opening out a gutter road. (Gen.)

Swamper, n. One who swamps. (Gen.)

Syn.: beaver, guttenman. (N. F.)

Swamp hook. A large, single hook on the end of a chain, used in handling logs, most commonly in skidding. (Gen.)

Sway bar. 1. A strong bar or pole, two of which couple and hold in position the front and rear sleds of a logging sled. (N. F.)

2. The bar used to couple two logging cars. (Gen.)

Swell butted. As applied to a tree, greatly enlarged at the base. (Gen.)

Syn.: bottle butted, churn butted.

Swing, v. See Gun.

Swing dingle. A single sled with wood-shod runners and a tongue with lateral play, used in hauling logs down steep slopes on bare ground. (N. F.)

Syn.: loose-tongued sloop.

Swing team. In a logging team of six, the pair between the leaders and the butt team. (P. C. F.)

Tail chain. A heavy chain bound around the trailing end of logs, as a brake, in slooping on steep slopes. (N. W.)

Taildown, to. To roll logs on a skidway to a point on the skids where they can be quickly reached by the loading crew. (N. F.)

Tail hold. 1. A means of obtaining increased power in moving a log by tackle. The cable is passed through a block attached to the log and the end fastened to a stationary object, so that hauling on the other end gives twice the power which would be attained by direct attachment of the cable to the log. (P. C. F.)

2. The attachment of the rear end of a donkey sled, usually to a tree or stump. (P. C. F.)

Tail hook. See Dog.

Tally board. A thin, smooth board used by a scaler to record the number or volume of logs. (Gen.)

Tally man. One who records or tallies the measurements of logs as they are called by the scaler. (N. F.)

Tank, n. See Sprinkler.

Tank conductor. One who has charge of the crew which operates a sprinkler or tank, and who regulates the flow of water, in icing logging roads. (N. F.)

Tank heater. A sheet-iron cylinder extending through a tank or sprinkler, in which a fire is kept to prevent the water in the tank from freezing while icing logging roads in extremely cold weather. (N. F.)

Tanking. The act of hauling water in a tank, to ice a logging road. (N. F.)

Tee, n. A strip of iron about 6 inches long with a hole in the center, to which a short chain is attached; it is passed through a hole in a gate plank, turned crosswise, and so used to hold the plank when tripped in a splash dam. (N. W.)

Throw, v. See Wedge a tree, to.

Throw line. See Trip line.

Throw out. See Frog.

Tide, n. A freshet. In the Appalachian region logs are rolled into a stream and a "tide" awaited to carry them to the boom. (App.)

Timber wheels. See Logging wheels.

Toe ring. The heavy ring or ferrule on the end of a cant hook. It has a lip on the lower edge to prevent slipping when a log is grasped. (Gen.)

Toggle chain. A short chain with a ring at one end and a toggle hook and ring at the other, fastened to the sway bar or bunk of a logging sled, and used to regulate the length of a binding chain. (N. F.)

Syn.: bunk chain.

Toggle hook. A grab hook with a long shank, used on a toggle chain. (N. F.)

Tonging, v. Handling logs with skidding tongs. (N. F.)

Top chains. Chains used to secure the upper tiers of a load of logs after the capacity of the regular binding chains has been filled. (Gen.)

Top load. A load of logs piled more than one tier high, as distinguished from a bunk load. (Gen.)

Top loader. That member of a loading crew who stands on the top of a load and places logs as they are sent up. (Gen.)

Syn.: sky hooker. (N. F.)

Tote, v. To haul supplies to a logging camp. (N. F.)

Tote road. A road used for hauling supplies to a logging camp. (N. F.)

Syn.: hay road.

Tote sled. See Jumper.

Tow team. An extra team stationed at an incline in a logging road to assist the regular teams in ascending with loaded sleds. (N. F.)

Syn.: snatch team.

Trailers, n. Several logging sleds hitched behind one another and pulled by from 4 to 8 horses driven by one man, thus saving teamster's wages. (N. F.)

Tram, n. See Tramway.

Tramway, n. A light or temporary railroad for the transportation of logs, often with wooden rails and operated by horse power. (Gen.)

Syn.: tram.

Travois, n. See Dray.

Travois road. See Skid road.

Trip, v. See Wedge a tree, to.

Trip, n. See Turn.

Trip a dam, to. To remove the plank which closes a splash dam. (N. F.)

Trip line. 1. A light rope attached to a dog hook, used to free the latter when employed in breaking a jam, a skidway or a load. (N. F.)

Syn.: throw line.

2. See Haul back.

Tripsill, n. A timber placed across the bottom of the sluiceway in a splash dam, against which rest the planks by which the dam is closed. (Gen.)

Trough roof. A roof on a logging camp or barn, made of small logs split lengthwise, hollowed into troughs and laid from ridge pole to eaves. The joints of the lower tier are covered by inverted troughs. (N. F.)

Turkey, n. A bag containing a lumberjack's outfit. To "histe the turkey" is to take one's personal belongings and leave camp. (N. W., L. S.)

Turn, n. 1. A single trip and return made by one team in hauling logs; e.g., a four-turn road is a road the length of which will permit of only four round trips per day. (N. F.)

Syn.: trip. (Gen.)

2. Two or more logs coupled together end to end for hauling. (P. C. F.)

Turnout, n. A short side road from a logging-sled road, to allow loaded sleds to pass. (N. W., L. S.)

Twin sleds. See Logging sled.

Twister, n. See Spanish windlass.

Twitch, v. See Skid.

Two sleds. See Logging sled.

Undercut, v. See Notch.

Undercut, n. The notch cut in a tree to determine the direction in which the tree is to fall, and to prevent splitting. (Gen.)

Syn.: notch (Gen.), nick (S. F.).

Undercutter, n. A skilled woodsman who chops the undercut in trees so that they shall fall in the proper direction. (Gen.)

Union drive. A drive of logs belonging to several owners, who share the expense pro rata. (N. F.)

Upright roller. A flanged roller placed upright at a bend in a skid road to direct the cable. (P. C. F.)

Syn.: roller, dolly.

Value, v. See Cruise.

Valuer, n. See Cruiser.

Van, n. The small store in a logging camp in which clothing, tobacco and medicine are kept to supply the crew. (N. W., L. S.) See Commissary.

Wagon sled. See Logging sled.

Wanigan, n. A houseboat used as sleeping quarters or as kitchen and dining room by river drivers. (N. W., L. S.)

Syn.: ark (N. F.), shanty boat (S. F.).

Water ladder. Pole guides up and down which a barrel slides in filling a sprinkler by horse power. (N. W., L. S.)

Water slide. See Flume.

Wedge a tree, to. To topple over with wedges a tree that is being felled. (Gen.)

Syn.: throw, trip.

Wet slide. See Flume.

Whiffletree neckyoke. A heavy logging neckyoke, to the ends of which short whiffletrees are attached by rings. From the ends of the whiffletrees wide straps run to the breeching, thus giving the team added power in holding back loads on steep slopes. (N. F.)

White water man. A log driver who is expert in breaking jams on rapids or falls. (N. F.)

Widow maker. A broken limb hanging loose in the top of a tree, which in its fall may injure a man below (N. F.), or a breaking cable (P. C. F.)

Wigwam, to make a. In felling trees, to lodge several in such a way that they support each other. (N. F.)

Windfall, n. An area upon which the trees have been thrown by wind; also, a single tree thrown by wind. (Gen.)

Syn.: blow down, wind slash. (N. F.)

Windshake, n. See Shake.

Wind slash. See Windfall.

Wing dam. See Pier dam.

Wing jam. A jam which is formed against an obstacle in the stream and slants upstream until the upper end rests solidly against one shore, with an open channel for the passage of logs on the opposite side. (N. F.)

Woodpecker, n. A poor chopper. (Gen.)

Wrapper chain. See Binding chain.

Yard, n. See Landing.

Yarding donkey. A donkey engine mounted upon a heavy sled, used in yarding logs by drum and cable. (P. C. F.)

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