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Logging and landscape change on the North Shore of Burrard Inlet, British Columbia: 1860's to 1930's

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Logging constituted the first industry on the North Shore of Burrard Inlet and remained an important part of the local economy until its decline in the early 1930's. Between the 1860's and the 1930's enormous changes were made in West Coast logging technology, and lumbermen had an increasingly visible impact on the forest landscape as they employed industrial technology in the woods. Over the decades the spatial pattern of the lumber industry on the North Shore changed significantly: lumber operations moved away from the water's edge into the steep slopes of the North Shore Mountains.

This thesis offers a study of early forest exploitation in this Coast Mountain environment. It examines how innovations in logging transport technology affected the spatial pattern and the environmental impact of the industry. Changing market conditions for lumber and shingle products are included in the discussion. In many ways the North Shore of Burrard Inlet was a microcosm of logging technology on the West Coast. Company records, historical maps and photographs, surveyor's field notes, reports of the Forest Branch and the Water Rights Branch and various correspondence files provided the majority of the primary data. Remains of logging operations were located during numerous hikes in the North Shore Mountains.

From the 1860's to the 1890's human and animal power was used in the woods and lumber operations had a relatively small impact on the forest ecosystem. After the turn of the century steam power was adopted in the North Shore forests and lumbermen began to change the appearance of the land. By the 1920's several capital-intensive, large scale operations had emerged which employed logging railroads, trucks, and high-lead-yarding. They pushed into steep, hitherto inaccessible slopes and left barren, slash-covered clear cuts, prone to forest fires. Cutting regulations were virtually nonexistent and the devastated hill sides were left to natural regeneration.

The public grew increasingly concerned over logging operations in Vancouver's water supply areas and the Greater Vancouver Water District was incorporated in 1924 to protect these watersheds. It gradually bought out all lumber companies; by the early 1930's the Capilano, Lynn and Seymour catchment areas were closed watersheds.
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Chapter 1: Establishing a Context

Burrard Inlet is the southernmost coastal inlet on British Columbia’s deeply indented mainland coast. Across the inlet lies the city of Vancouver with a population of over 400,000 people. From the northern shore of this deep-water basin that is today a leading port, steep mountains rise to elevations above 1600 meters. On the lower flanks are the municipalities of North and West Vancouver, today functional suburbs of metropolitan Vancouver. Above, ridges and abrupt cliffs separate river valleys where mountain creeks have cut deep gulleys into precipitous granitic slopes (figures 1.1, 1.2). Repeated glaciation has widened these valleys and sculptured cirques at high elevations, where small lakes have formed. Thick deposits of clay, silt and gravel, a legacy of glaciation, cover much of the bedrock and are prone to washouts and landslides in this high energy environment. Modern roads, a gondola and chair lifts provide easy access for hikers and skiers. The upper reaches of the Capilano and Seymour Rivers are closed watersheds, supplying domestic water for the Greater Vancouver District.

Mean annual precipitation on the North Shore of Burrard Inlet ranges from 1500 mm near sea level to over 3500 mm in the alpine area. Most of the precipitation falls as rain, with peak incidence in late fall and winter. As a result of frequent mid-latitude cyclonic storms the rainfall intensity is often very high, with maximum amounts of 25 cm in a 24 hour period. Snow accumulations at higher elevations produce complex river regimes, marked by peak discharges during winter rains and spring snowmelt.

The lower reaches of the North Shore Mountains generally fall within the coastal western hemlock biogeoclimatic zone, the wettest and most productive forest zone of British Columbia. Common species are western hemlock, western red cedar, amabilis fir, and Douglas fir (fig. 1.3).
fig. 1.1 the north shore of Burrard Inlet

Legend:
--- River

1 cm = 2 km
Fig. 1-2 The rugged terrain of the North Shore Mountains
fig. 1.3 Biogeoclimatic zones on the north shore of Burrard Inlet

- Alpine zone
- Mountain hemlock zone
- Coastal western hemlock zone

1000 m

- Tsuga heterophylla - Western hemlock
- Thuja plicata - Western red cedar
- Abies amabilis - Amabilis fir
- Tsuga heterophylla - Mountain hemlock
- Chamaecyparis nootkatensis - Yellow cedar
- Shrubs, Lichens, herbs

1500 m

- Pseudotsuga menziesii - Douglas fir
- Abies amabilis - Amabilis fir
Red cedar and western hemlock are shade tolerant species and reach heights of about 60 meters. The shade intolerant Douglas fir grows taller, up to 70 and 80 meters. It has a straight, cylindrical stem with few knots and a high crown; red cedar has a low crown and strong butt swell. The coastal subalpine zone of mountain hemlock, yellow cedar and western hemlock begins at elevations of 800 to 1000 meters. Mountain hemlock is the dominant species. Western hemlock grows well in this zone but usually does not occur in greater numbers than mountain hemlock. Above 1600 m these subalpine species give way to alpine tundra, characterized by low growing shrubs, herbs and lichens.

High precipitation and moderate to cool temperatures create podsolic soils, that are well drained but infertile because clay, organic matter, iron and aluminum are leached from the topsoil. The soils of the coastal western hemlock biogeoclimatic zone are of the ferro-humic type, marked by the accumulation of organic matter in the sub-soil. Slow creep in this steep terrain hinders soil development and morainic deposits are prone to erosion.

The North Shore Mountains are part of the Coast Mountain Range, a continuous mountain chain running along the mainland coast for over 1,600 kilometers. Throughout, the topography is rugged, but maximum elevations vary considerably. Some of the highest peaks are in the southern and northern section of the range. Conditions for forest growth are most favourable in southern parts of the Coastal Mountains. To the north, the frost-free season is shorter and precipitation increases. About half the annual precipitation falls as snow. The altitudinal range of the coastal hemlock zone

1 A. L. Farley, atlas of British Columbia (Vancouver: the University of British Columbia Press, 1979), p. 36.
3 In the north Mount Fairweather, the highest mountain in British Columbia, reaches 4,663 m and in the south Mount Waddington is 4,016 m high.
shrinks in consequence, from 1000 meters on favourable sites in the south, to
300 m in the north.

In the 18th century a substantial native population, divided into
six linguistic families, occupied the coast of the province. In 1780, over 80,000
Indians lived in the area that is today British Columbia. The majority of them
were concentrated in the coastal areas. The Coast Salish people lived in the
south. Members of the Squamish and the Musqueam Indian Bands occupied
several sheltered village sites on Burrard Inlet. They utilized trees for houses,
canoes and totem poles and wove the bark of red cedar into clothing, but their
impact on the vegetation cover was minimal.

Europeans entered this realm in the 1770’s, when explorers
charted the coast line and began trading with the Indians. Captain George
Vancouver explored Burrard Inlet in June 1792 and described it in his diary:

The shores of this channel... may be considered, on the southern side,
of a moderate height, and though rocky, well covered with trees of a large growth,
principally of the pine tribe. On the northern side, the rugged snowy barrier...
rose very abruptly, and was only protected from the wash of the sea by a very
narrow border of low land.

The fur trade soon became important: the Hudson’s Bay Company established
Fort Langley in 1827 and Fort Victoria in 1843 but their presence hardly
changed the appearance of the coastal landscape.

Then, in the 1860’s, two sawmills were established on Burrard
Inlet: a mill on the north shore at a site later known as "Moodyville", and
Stamp’s mill on the south shore (fig. 1.4).

4 Wilson Duff, The Indian History of British Columbia (Victoria: British Columbia
5 George Vancouver, Voyage of Discovery to the North Pacific Ocean, vol 1 (London:
1798), p.xi.
fig. 1.4  moodyville and hastings mill

Legend:
- sawmill

Moodyville Mill
Hastings Mill

1 cm = 2 km
Burrard Inlet provided a sheltered deep water port and the timber growing along its shores was of outstanding quality. The industry was quickly successful and both mills concentrated on the export market. Small settlements were established around them and by 1868 about 300 men worked in the lumber industry along the shores of Burrard Inlet. Some of them were directly employed by the mills; others were independent contractors who supplied them with timber. Jeremiah Rogers, for example, logged the forests of Kitsilano, English Bay and False Creek and sold the logs to Stamp’s Mill (later called Hastings Mill).

The 1860’s marked the beginning of commercial exploitation of the Burrard Inlet forests. Large-scale, planned logging operations started to change the appearance of the forest. Between 1867 and 1868 the Moodyville sawmill cut 5,832,000 feet of lumber and 800,000 shingles for markets in Australia, South America and England. In the same year the Hastings Mill cut 4,101,000 feet of lumber, 100,000 shingles and 2,000 spars.\(^6\)

In 1884 Burrard Inlet had fewer than one thousand residents, but the extension of the CPR line from Port Moody to Vancouver in 1887 stimulated population growth and improved Vancouver’s relative location as an export point. Migrants from Eastern Canada, Great Britain, the United States and the Orient were drawn to the city. By 1891 its population had risen to 13,709.\(^7\) By 1901 it was 27,000 and in 1911 it exceeded 100,000. In 25 years a major urban center had risen on the shores of Burrard Inlet. On the North Shore, connected to Vancouver only by ferry, there were over 8,000 people in 1911.


\(^7\) N. MacDonald, "The Canadian Pacific Railway and Vancouver’s Development to 1900", *BC Studies*, no. 35 (1977), p. 9.
As population grew, so interest in the coastal forests of British Columbia soared. By the turn of the century vast areas of the North American continent had been logged over and Eastern Canadian and American capitalists scrambled to secure the future of the lumber industry in the virgin forests of the Pacific North West. Between 1890 and 1910 American lumbermen cruised almost all accessible forest land in British Columbia. As a lumber trade journal observed in 1906:

> Literally the woods are full of United States timber cruisers. All along the coast to the north of Vancouver where there is unstaked timber numerous cruisers from Puget sound are at work. They represent United States capital, which is seeking timber in this province...

Prairie settlement, new transcontinental railroads and the anticipated construction of the Panama Canal fostered continued exploitation.

The lack of adequate forest policy and regulation facilitated timber alienation in British Columbia. Here it is important to distinguish between permanent and temporary alienations. Although direct, permanent sales of timber land were initiated in 1859 by Governor Douglas when timber was considered so abundant as to be of little commercial value, this form of alienation was relatively unimportant in the province. When the government began to realize that the real value of much of British Columbia's land was not in agriculture but in the forest, the sale of timberland was restricted. A provincial statute of 1884 declared that "no land chiefly valuable for timber shall be disposed of by public or private sale".

Temporary alienations have been far more significant, although the means by which they were implemented have varied widely as the government sought flexibility in its tenure arrangements to cope with fluctuations in the economic condition of the lumber industry. Four basic forms

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8 Lumberman and Contractor, September 1906, p. 9.
9 BC Stat. 1884, c.16, s.59.
of temporary alienation existed prior to World War I: Leases; licenses (general and special); handlogger's licenses; and timber sales licenses. All were based on the principle of disposing of timber separately from the land. The Crown retained the ownership of the land but granted the right to exploit the timber on it to private parties. The leasing system, introduced by Land Ordinance in 1865, was designed to encourage the establishment of sawmills in the province.\(^{10}\) Leases had no size limits and were subject to "such rent, terms and provisions as should seem expedient to the Lieutenant-Governor in Council". In the Land Act of 1888 lease conditions were specified in terms that revealed the administrators' aim to encourage investment in the manufacturing industry by length and security of the arrangement. Leases were granted for periods of up to 30 years (later reduced to 21 years), at an annual rent of 10 cents per acre. In return the lessee was required to construct a sawmill capable of cutting at least 1,000 F.B.M. per 12 hour day for each 400 acres included in his lease. In 1905 the leasing system was abolished by a provision of the Land Act because it no longer met the needs of the lumber industry.\(^{11}\)

A new tenure system was required to serve the growing number of small, independent logging operators in the province. General Timber licenses, introduced by the Timber Act of 1884, did not require the operation of a sawmill. To prevent speculation the terms of these licenses were very restrictive. Initially, they conferred a right to hold a specified area of the forest for only four years and they could be cancelled if the holder did not log. The annual rental was $10 and timber dues amounted to 15 cents per tree; in addition the government collected 20 cents per one thousand board feet of timber. The maximum extent of a license was 1,000 acres. Four years later


\(^{11}\) A total of about 688,000 acres had been alienated under the lease system.
general licenses were changed into special timber licenses, which were even more restrictive. They were not transferable and valid for five years only; they had to be renewed every year, and they were limited to 1,000 acres in extent. Fees were fixed at $50. In 1901 these timber licenses were further limited to 640 acres and the annual fee was increased to $100.

With the growth of the forest industry in the early twentieth century, small logging operators demanded more security of their timber supply. Interested in increasing its revenue from the forest resource, in 1905 the government enacted legislation that made all special timber licenses transferable and renewable each year for 21 years. Thus a license became a commodity which could be traded without restrictions for two decades. This encouraged timber speculation.\textsuperscript{12} So did abolition of restrictions on the number of licenses held by individuals. License contracts no longer required that the timber be cut, which further enhanced speculation. The annual license fee was $140 west of the Cascades and $115 east of the Cascades.

Hand loggers licenses were authorized in 1888. These licenses were issued to individuals and allowed them to log anywhere on Crown lands for an annual fee of ten dollars. Initially the method of logging was not restricted and the license could not be transferred.\textsuperscript{13} A provision inserted in the "Land Act" in 1906 forbade the use of steam machinery by handloggers and limited them to using axes, wedges, falling and bucking saws and Gilchrist Jacks.\textsuperscript{14} Harvesting methods, however, remained unregulated and as one critic

\textsuperscript{13} F. J. Fulton, Final Report of the Commission of Inquiry on Timber and Forestry, 1909-10 (Victoria: King's Printer, 1910).
of this form of licensing observed "debris could be left in any condition that suit[ed] the operator".\footnote{F. J. Fulton, opus cit.}

The timber sales license, the fourth type of temporary alienation, was created by the first Forest Act of 1912 and served as the main form of timber alienation until 1945. All timber sale licenses were offered on a competitive basis. The timber was cruised by forestry staff and put up for public auction. The Forest Branch established a minimum acceptable price above which competitors could bid. This "upset price" was based on the Forest Branch's estimate of the value of timber after subtracting costs of harvesting and transport. Soon this system of allocation served the dominant firms and was not very competitive.\footnote{S. Gray, "Forest Policy and Administration in British Columbia 1912-28", MA Thesis Simon Fraser University, 1982.} For the first time harvest regulations, such as removal of slash after logging, were included in the timber sales contracts. But for all their impressiveness on paper they were hardly enforced in the woods and harvesting without provision for sustained yield continued.\footnote{D. Haley, "An economic appraisal of sustained yield forest management in British Columbia," Ph.D. University of British Columbia 1966, p. 205.}

The early lumbermen of the coastal forest faced the challenge of steep slopes and big trees. Logging methods used elsewhere in North America had to be adapted to West Coast circumstances. Fallers and buckers needed special tools. The West Coast falling axe, developed in the Redwood forests of California, was adopted during the 1880's. Unlike eastern falling axes it was double-bitted, narrow-bladed and had a 106 cm (42") handle to get at the undercuts in big trees.\footnote{M. Shakespeare, opus cit. p. 28.} The crosscut saw became widely used during the same decade; it had to be lubricated with kerosene to prevent it from getting stuck in the pitch. The springboard (also called jump board or chopping board) was invented in the Pacific North West to avoid the thick, pitchy butts of
western red cedar. It would have been needless work to cut the thick butts, because the sawmills could not handle them. Felling was carried out with relatively primitive techniques for decades and did not become mechanized until after World War II, with the adoption of power saws developed in Germany.

Initially the big logs were towed along greased skidroads by teams of oxen. In the 1890's horses replaced oxen. Early skidroads penetrated the forest only for short distances away from the shoreline, but some operations eventually hauled logs over distances exceeding four kilometers with teams of horses or oxen. The lumbermen had to be very selective and only straight trees of high quality were taken.

The steam donkey engine, invented in the California Redwood forests in 1881, gradually replaced skidding with oxen or horses. Yarding with donkey engines was commonplace after the turn of the century, but some small companies and individual operators continued to use horses until the 1920's.\textsuperscript{19} The ground-lead-yardsing system dragged the logs along the ground and was limited to relatively flat terrain with little underbrush; 100 meters was often the maximum hauling distance. Logs were frequently caught on stumps, snapping cables and endangering the lives of the lumbermen. The haulback line was returned to the felling crew by the line horse. With the adoption of the double drum after the turn of the century the line horse was no longer needed in the woods.\textsuperscript{20}

High-lead-yardsing with a spar tree was common after 1915 and rapidly increased the efficiency of yarding (fig. 1.5).\textsuperscript{21}

\textsuperscript{19} Yarding refers to log transport with a cable machine from the forest to the landing, where the logs are collected for loading and hauling.

\textsuperscript{20} Western Lumberman August 1921, p. 76.

\textsuperscript{21} According to the Western Lumberman it was first used in Puget Sound in 1912. Ibid.
fig 1.5 high-lead-yarding

- **Spar tree**
- **Guy line**
- **Main line**
- **Main line**
- **Haul-back line**
- **Donkey engine**
It was a cable system which lifted the logs partially off the ground. A 36 to 60 meter tall spar tree was chosen at the center of a setting (area to be logged), limbed and topped by a high-rigger and guyed with six to nine lines to give it rigidity. A high-lead-block was hung from the top of the spar tree to hold the main line. This hauling line was passed from the drum of a donkey engine through to the high lead block and out to the logs to be yarded. Logs at a distance of up to 250 meters could be yarded this way.\textsuperscript{22} The complicated cable setting required clear-cutting, otherwise the suspended logs would catch on standing trees.

Logging railways became the most important mode of transportation for many larger companies during the years between 1900 and 1935.\textsuperscript{23} Three types of geared steam locomotives were commonly used: the Shay, the Heisler and the Climax. The Shay locomotive was invented in Michigan in 1880; the Climax was first produced in Pennsylvania in 1891; and the Heisler locomotive was built in 1894 by the Stearns Manufacturing Company, Erie, Pennsylvania. These machines differed in design, but all were well adapted to steep grades and sharp curves.\textsuperscript{24} The logging mainline typically had a grade of two to three percent, while the spur line grades were often five to six percent.\textsuperscript{25} Penetrating many kilometers inland, logging railways were used in conjunction with steam donkeys that yarded logs to the rail lines to extend the reach of logging operations enormously. Before 1930 truck logging was not common in British Columbia, but several companies

\textsuperscript{22} Western Lumberman, April 1919, p. 40.
\textsuperscript{25} R. D. Turner, opus cit. p. 5.
experimented with it successfully.\textsuperscript{26} It made even steeper and more remote stands of timber accessible.

The spatial pattern of the coastal lumber industry shifted with these new technologies. Timber leases granted during the last decades of the 19th century had been located near tide water and at the mouths of rivers on the Southern Coast, at Chemainus and Sayward on Vancouver Island. Early forest policy encouraged areal concentration of timber leases and licenses in easily accessible areas, because operators were free to take up tenure arrangements anywhere on Crown land.\textsuperscript{27} After 1900 the lumber industry was still concentrated along the southern mainland coast and along the east coast of Vancouver Island, but logging railways began to push many kilometers inland. By 1916 twenty one logging railways existed in British Columbia and extensive rail systems were constructed in the Powell River area, near Sayward, Chemainus and in the Cowichan Valley. In 1924, less than a decade later, 74 logging railways were in use. During the 1920's and 1930's logging operations became increasingly widespread along the North Coast and on the Queen Charlotte Islands; logs were towed over 800 km to be processed in the Vancouver area. Sawmilling and logging had become increasingly separated and Vancouver emerged as a processing center.\textsuperscript{28}

Railroads, steam donkeys and trucks required far more capital than earlier, small scale logging ventures. With available capital concentrated in the hands of Eastern Canadian and American "lumber barons", small

\textsuperscript{26} The Duplex truck, produced in Michigan, was the most successful and most widely used logging truck of the time.
\textsuperscript{27} W. G. Hardwick, \textit{Geography of the Forest Industry of Coastal British Columbia} (Occasional Papers in Geography, no. 5, 1963). This pattern of concentration changed with the introduction of sustained yield management in 1945.
\textsuperscript{28} A. L. Farley, \textit{Atlas of British Columbia} (Vancouver: the University of British Columbia Press, 1979), p. 64.
enterprises, typical of the early logging era, found it increasingly difficult to compete. As the *Western Lumberman* recognized in 1909,

*More and more every year are the loggers being forced back from the coast line to secure their timber, and as a consequence the number of these steam logging roads will rapidly increase where there are extensive limits to be logged... The day of the big logger, the man with hundreds of thousands of dollars behind him is here, and with his coming the small man is gradually passing away...*

By the 1920's the lumber industry was dominated by heavily capitalized firms, which coexisted with numerous independent operators. This trend towards large, integrated firms was noticeable all across Canada after the end of World War I.

These new and powerful technologies accelerated the rate of forest exploitation, leaving vast clear-cuts in the coastal forests. The ecological changes following clear cutting were considerable. Erosion, washouts and forest fires were immediate consequences of logging. Often the species composition was altered and valuable Douglas fir could not regenerate successfully. Douglas fir grows on well-drained mineral soils and requires much light. Enormous amounts of organic material covered the ground after clear cutting and created unfavourable conditions for Douglas fir. Few seeds reached the center of clear cuts because not enough seed trees were left standing. After a forest fire Douglas fir was often outcompeted by red alder. It can fix nitrogen and thus establishes itself quickly on soils deprived of nutrients.

No reforestation or site preparation was undertaken after logging and vast cut-over areas were left to natural regeneration. Forest service officials generally held the belief that artificial reforestation was needless, "when natural reforestation, costing practically nothing, [was] .... doing the job

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29 *Western Lumberman*, August 1909, p. 12.
far more efficiently than any artificial facilities could do it." The prevention of forest fires was considered sufficient to achieve successful regeneration. The cost of reforestation was estimated to amount to $20 per acre during the 1920's; with some 60,000 acres logged annually, the cost would have been $1,200,000, "a rather impressive figure." T. D. Pattullo, Minister of Lands in 1925, was convinced that "competent world opinion" favoured natural regeneration because it brought better results and was less costly. He stressed that "Nature has been most lavish in her treatment of us. She has not only given us magnificent forests capable of supporting a very fine industry, but our forests are of tree species that are easily reproduced." His optimistic predictions proved wrong: the second growth forest of coastal British Columbia is frequently stocked with less valuable species and today western hemlock is the predominant species on the coast.

The existing literature on the complex history of forest exploitation in coastal British Columbia tends to treat the subject in a general manner. Several books and articles deal with British Columbia's forest history in an anecdotal style and focus on the experiences of a few prominent individuals. Other popular histories deal with technological changes in the lumber industry, but do not examine spatial patterns or environmental impact. Some of these general histories are informative and cover the subject well, such as MacKay's _The Lumberjacks_. A second cluster of work has been produced by the Historical Railway Association which sponsored several books on logging railways, providing general information about camps, equipment and company

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31 British Columbia Lumberman, July 1924, p. 29.
32 Ibid.
33 British Columbia Lumberman, February 1925, p. 42.
34 For example: J. Morton, _The enterprising Mr. Moody, the bumptious Captain Stamp_ (Vancouver: J.J. Douglas Ltd., 1977).
histories. A third body of literature deals with the policy framework. These studies tend to be more analytical than popular histories, but they, too, put little emphasis on spatial aspects. Overall, the lack of carefully constructed case studies in the literature on British Columbia's forest history is striking.

This thesis offers a study of early forest exploitation in one small part of the Coast Mountains. It attempts to trace the past of a particular place and to understand the changing evaluation and use of its natural resources. Yet in many respects the history of logging on the North Shore of Burrard Inlet exemplifies the overall technological evolution of West Coast logging and associated changes in spatial pattern and environmental impact of the industry. Logging operations moved further away from the water's edge and into increasingly steep terrain.

Initially the mills on Burrard Inlet supplied a Pacific Rim market with spars and hewn lumber. After the arrival of the CPR local and prairie markets opened up and small operations emerged, many of which cut shingle bolts. The years 1905 to 1912 were a period of strong expansion in the forest industry. This timber boom ended with the depression of 1913. Extremely unstable economic conditions followed during World War I. Some companies, however, profited from war-fuelled demand and a tendency towards larger operations was noticeable in British Columbia. Three relatively capital intensive operations emerged on the North Shore of Burrard Inlet, which concentrated on the production of saw logs and lumber.

Yet in some ways logging on Vancouver's North Shore differed from that in other parts of the coast, because this area was in the "backyard"

of a growing urban center. With population growth on the North Shore and on
the south side of Burrard Inlet much lumber was needed locally. The
emergence of a local market dropped transport costs considerably and was a
strong incentive to log the North Shore mountains. The logged-off forest land
close to the shores of Burrard Inlet was turned into residential land. The
lumbermen had to turn to steeper slopes for timber, at a greater distance from
the waterfront.

North Shore lumber companies were often among the first in the
province to experiment with new technologies. The McNair-Fraser Lumber
Company in West Vancouver, for example, was the only company in British
Columbia which utilized a "Walking Dudley". This machine was basically a
donkey engine on rails which hauled itself up and down the steep slopes on
steel cables. In 1917 Cedars Limited, which operated in the headwaters of the
Lynn Valley, was the first British Columbian lumber company to utilize motor
trucks successfully. The Deep Cove Lumber Company also adopted this mode
of transportation in 1919, well before it became widespread in British
Columbia during the 1930's.

Some North Shore logging companies were also clever real estate
agents, marketing both their land and their lumber products. Lumbering
coeexisted with residential, commercial and industrial development and did not
form the exclusive economic base of the North Shore. Many individuals held
permits to cut shingle bolts while they had other sources of income as well.38
Thus fluctuations in the industry and its eventual decline did not entail
settlement abandonment, a pattern typical of other resource based towns.

The greatest difference between the North Shore Mountains and
other coastal areas however was in the growing concern for watershed

38 It is impossible to document the history of these individual shingle bolt cutters because few records exist.
protection. In the late 1880's Vancouver began to draw its domestic water supply from the Capilano River. In the next decade the city purchased the waterworks from the "Vancouver Waterworks Company" and expanded the system. In 1908 new supply mains were constructed from Seymour Creek. But the city failed to acquire control of the watersheds and could not afford to buy the land once it had been alienated by lumber companies. As a result, and as ideas from the American Progressive Conservation Movement gained currency in British Columbia in the early twentieth century, watershed protection became a central issue on the North Shore of Burrard Inlet. Concerned about the environmental impact of logging on their water supply, residents found themselves in frequent confrontation with the logging companies. By the early 1930's the Capilano and Seymour watersheds were under the control of the Greater Vancouver Water District and all logging was stopped. The City of North Vancouver controlled the Lynn watershed which was sealed off from the public as well.

The logged-off hillsides of the North Shore Mountains were left to natural regeneration. At present these slopes are once again covered with lush forest and from a distance various shades of green are the only evidence of former logging activities. Selective logging on a sustained yield basis is carried out in the watersheds of the Capilano and Seymour Rivers to maintain water quality. Recreational use has become increasingly important on the North Shore of Burrard Inlet and currently the lower Seymour watershed is managed for multiple use purposes, while the Lynn Headwaters area has become a regional park.
Chapter 2: The Moodyville Operation and Early Shingle Outfits.

Pioneer lumbermen in British Columbia had easy access to vast areas of valuable timberland. They could seek out the best timber in the most accessible locations and were given extremely generous terms of tenure by the government. Yet it was difficult for them to establish a successful sawmill: they neither had large local nor steady foreign markets for their lumber.

Before the arrival of the CPR in Vancouver in 1887, western lumbermen depended on small, unstable local markets and distant markets around the Pacific rim. These markets determined the type of lumber products: spars and high grade Douglas fir lumber constituted the main export items. Constrained by their dependence on a technology of oxen and axes as well as by markets, early lumbermen logged selectively. Transfer costs were too high to consider the export of low grade lumber.

The lumber industry on the North Shore of Burrard Inlet started in the 1860's, facing these market problems and lack of capital. The first mill on the North Shore was established in 1863 by the T.W. Graham Company, which had acquired 480 acres of timber located between present-day Lonsdale Street and the mouth of Lynn Creek. Burrard Inlet was an ideal site for a sawmill, because it had a sheltered deep water port, gentle slopes and easily accessible stands of valuable timber.

In the eyes of Chief Commissioner of Lands and Works, Colonel R. C. Moody, the mill was also an asset because it would encourage land clearing and provide employment for settlers. As he described the North Shore and the Graham mill in 1863,
....the district is densely wooded, the operation amounts to partial clearings and employment of labour on wages. These two circumstances will have the effect of causing such partial clearings to be settled upon and cultivated by the very parties whose labour will now be paid for by the mill. Through this process as a commencement, we may look for a settlement of the district, and without such commencement it may be many years before there would be sufficient inducement for anyone to occupy the land in that neighborhood.38

Driven by a water wheel on a flume from Lynn Creek, the mill was in operation by June 1863, and had a capacity of 40,000 feet of lumber per day.40 Its cut was sold at local markets in Victoria, Nanaimo and New Westminster.41 According to an advertisement in the British Columbian of July 1863 the company was prepared to "furnish fir, cedar, spruce lumber also tongued and grooved flooring to be delivered at the mill, New Westminster or Victoria, at prices lower than Puget Sound lumber".42 But income failed to meet costs. Lack of capital and strong competition in the local market from New Westminster mills forced the owners to sell out after only 6 months of operation. In December 1863 the mill was sold to John Oscar Smith, a grocer from New Westminster. Through 1864 Victoria was the main market for lumber from Smith's mill although he sent a cargo of 227,500 feet of lumber and 16,000 spars to Adelaide, Australia.43 On January 19, 1865 he sold the business to S.P. Moody, an American from Maine, for $6,900.44

Moody realized the importance of Pacific Rim markets. His first load of lumber went to Sydney, Australia and was followed by two shipments to Mexico.45 In 1866 he entered a partnership with William Dietz, a miner,
and Hugh Nelson, a businessman. The business of the new "Moody, Dietz and Nelson Company" picked up rapidly and soon more timber grants were needed. In 1866 the company applied to Governor Seymour for 5000 acres of timberland on the North Shore. Carefully responding to the government's concern to encourage settlement and agriculture Moody wrote:

...Your memorialists own the first and only sawmill on Burrard Inlet, where after a delay of two years, and at a considerable expense, we have succeeded in establishing a good foreign trade in lumber and spars...The timber on the land originally preempted...will be exhausted for all practical purposes in two months from this date.... Your memorialists further beg to state... that the land on which this heavy timber grows, is for the present unfitted for agricultural purposes, it is therefore impossible for your memorialists to interfere in any way with the rights of actual or intending settlers....

Moody was granted a lease of 5000 acres located close to the mill and to the shore. Later it was reduced to 2,636 acres, because some of the area leased was on Indian Reserve land and some was set aside for grazing. Figure 2.1 indicates all the timber leases acquired by the Moodyville operation on the North Shore over the years. Some of the early leases were turned into company preemptions and are marked as such on the map.

Many good trees could be felled directly into the water, a common practice during the early years of the lumber industry. This method was limited to a narrow band, perhaps 200 meters in width, back from the shoreline and only the best trees were taken (fig. 2.2). Many choice trees were wasted, because they frequently got stuck on shallow beaches or were shattered if tipped from a bluff. Back from the water's edge a skid ran through the timberholding.

by barkers. Additional Manuscript 237, Major Mathews Collection, Vancouver City Archives.

46 Colonial Correspondence. Moody to Governor Seymour 1866. File 67, Provincial Archives of British Columbia.

47 Timber lease 65. Forestry Records Division, Victoria.


49 T. W. Bell, Additional Manuscript 144, file 3. Vancouver City Archives. Bell came to Burrard Inlet in 1871.
fig. 21
Timber leases of the Moodyville Co.

Legend:
- Company's preemption
- Leased in 1870
- Leased in 1875

N

1 cm = 2 km
Fig. 2.2  Hand-logging at Moodyville (Vancouver City Archives)
Trees were felled by axe onto a bedding of small timber to reduce the impact of the fall. After the trees had been limbed and bucked, oxen dragged the logs on gently sloping skids. A greaser, equipped with a pail and a wide brush, went ahead of the ox-teams and greased each cross-timber with dogfish oil. It was produced locally by Indians, who sold it to the logging operations around Burrard Inlet. Soon a commercial dogfish operation was set up at Burrard Inlet which employed some 50 men, half of them Indians. Dogfish oil fetched a price of 40 cents per gallon at Burrard Inlet and about 60 cents in the Puget Sound area.

Such logging as Moody undertook on this tract during the 1860's was very selective and many trees were left standing. Some were too big for the mill to handle, others had too many knots and branches in the stemwood. Even though these early lumbermen were not concerned with forest ecology, they unknowingly left seed trees which would help the establishment of a new crop. The successful regeneration of the forest after bull team logging is well documented in Island County, Washington. Evidence about second growth is difficult to find for the Moodyville operation, because much of its logged land near the shore line was taken over by settlers as soon as the company's 21-year leases expired. But contemporary photographs indicate that although there was a small logging camp on the shore close to the mill, its impact on the forest landscape was minimal compared to that of later, more mechanized logging operations.

In 1868 the company constructed a steam powered mill close to the original mill (fig. 2.3).

50 M. Logan, Additional Manuscript 138b, Major Mathews Collection, Vancouver City Archives.
51 Daily British Colonist, May 19, 1871.
It was equipped with circular saws, a planing machine, a lathe splitting machine and a lathe and had a cutting capacity of 50,000 feet per 12 hour day. The combined output of the two mills was 90,000 feet of lumber per day. Some 200 men were employed by the company. The new mill and good export business accelerated the cutting of timber and in June 1870 Moody, Dietz and Nelson acquired 11,410 acres of timber. About half of these limits were located on the North Shore of Burrard Inlet, east and west of the Capilano River and east of the Seymour River. The remaining leases were scattered on the South Shore of Burrard Inlet, at Port Moody, north of Squamish River, Thunder Bay (Jervis Inlet) and at Malaspina Strait.

Another 10,162 acres were granted to the company in 1875. By that time it controlled a total of 24,688 acres of timberland. The new lease consisted of 13 parcels of forest land; only three were located on the North Shore of Burrard Inlet. 1,460 acres were in Lynn Valley, 500 acres on the lower reaches of Seymour Creek and 385 acres at Deep Cove. The remaining limits were at Jervis Inlet (Deserted Bay, Princess Royal Reach, Vancouver Bay, Scotch Fir Point), Sechelt (Porpoise Bay, Narrows Arm) and east of Malaspina Strait (see table 2.1 for detail on timber leases).

The timber grant west of Lynn Creek was the focus of the company's logging activities on the North Shore during the 1870's. The company took great care to construct a durable skid: logs 1.5 meters in length were laid across the cleared path; the center part of the log trail was hollowed out, creating an opening 60 cm wide and 7 to 10 cm deep. A piece of hardwood was then inserted, usually birch, and spiked down. This time consuming and costly method of skid construction was worthwhile, because hardwood was

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53 Timber Lease number 53 (January 11 1875), Forestry Records Division, Victoria.
54 This parcel of timber lease 53 is commonly referred to as timber limit #12.
more resistant to abrasion by heavy logs and thus the skid lasted longer. The logs were yarded to the main skid by teams of four to six oxen, whence teams of eight to ten animals hauled them as far as four kilometers, sometimes even further. While the greaser lubricated most parts of the skid with dogfish oil, he occasionally sprinkled sand on steeper grades to prevent the logs from gaining too much momentum.

A small timber limit to the west of this operation was cut over by the Moodyville company at the same time. A survey made some three decades later indicated that the impact of these early lumbermen was still limited and a dense second growth forest of hemlock, willow, fir and cedar was established. Parts of the limit, however, were burnt over and there the soil was found to be poor and gravelly.

According to the *Daily British Colonist* of Victoria "300 men found employment in one way or another in connection with this [Moodyville] establishment" in 1876. Between January and April of 1876 it shipped 4,118,481 feet of lumber to Australia, South America, China and Japan. The Moodyville Sawmill Company operated two logging camps on the North Shore in 1881 and employed 50 handloggers; 30 were Indians who logged at Jervis Inlet. The logs were towed to Burrard Inlet for up to 120 miles by the company's boat "Etta White". Several handloggers operated at Deep Cove, living in mobile camps on log floats. It is not confirmed whether the company

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55 M. Logan, Additional Manuscript 138b, Major Mathews Collection, Vancouver City Archives.
56 These animals were treated very well by the ox-teamsters and had names such as Spot, Sherry, Brandy, Whisky and Port. T. W. Bell, Additional Manuscript 144, file 3. Vancouver City Archives.
57 Ibid.
58 Survey of District Lot 2026, October 18, 1901. Surveyor's notes, Surveys and Lands Branch Victoria.
59 *Daily British Colonist*, April 18, 1876.
60 Ibid.
built a skid into the Deep Cove limit, but it seems unlikely considering the steepness of the terrain.

By 1884 the Moodyville company "was the most extensive of its kind in the province", with a capacity of 100,000 feet of lumber a day; annual output was about 18,000,000 board feet. The power of the combined water and steam power mill was equivalent to 1,000 horses. Approximately 100 men worked in the mill for monthly wages of $50 - $125. Another 100 men worked in the logging camps. As a report in the *Daily British Colonist* revealed, the best of timber had already been culled from local leases on Burrard Inlet:

*The timber limits are now becoming scarce and logs have to be towed in booms from a distance to the mills. In time the company expect that the ground already culled will have to be gone over again and the best of the standing timber cut.*

Even though rich stands of virgin timber grew on the mountain sides of the North Shore, they were beyond reach for early lumbermen. In that year the Moodyville Sawmill Company acquired 1,947 acres of easily accessible timberland east of Malaspina Strait.

By 1888 twenty five sawmills operated in British Columbia. They leased a total of 135,063 acres of timberland and together produced 140,000,000 feet of timber. Over twenty percent of this (29,182,960 feet) came from Moodyville. The Moodyville sawmill and Hastings Mill were said to be cutting "actively during the season, the demand, both local and export, being good." In all 35 shiploads of lumber were shipped from Burrard Inlet. Some 8,000,000 feet went to South America, 4,157,684 feet to China, almost 16,000,000 feet to Australia and 146,869 feet to Japan. The balance of

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63 Ibid.
64 Ibid.
65 Timber lease number 54 (November 28 1884), Forestry Records Division, Victoria.
67 *Canada Lumberman*, March 1889, p. 6.
897,460 feet was taken by local dealers. Hastings Mill across the inlet cut a total of 14,048,844 feet and sent out 17 vessels to export markets.

New machinery added to the Moodyville mill at the end of the decade increased its cutting capacity to 105,000 feet of lumber per day. The company operated four logging camps and received logs from two camps run by contractors, employing over 200 lumbermen.

During these years the Moodyville Sawmill Company leased another 2,233 acres of timber east of Malaspina Strait and acquired three additional leases, 7,591 acres, in the vicinity of Sayward, Squamish, St. Vincent Bay (Jervis Inlet) and east of Cordero Channel.

Easily accessible timber on gentle slopes was becoming increasingly scarce and the company ventured further north to obtain its timber. While timber limits were sought further away from the mill site, timber of outstanding quality was still cut along the lower reaches of the Capilano River and the spatial pattern of the company’s logging operations did not change. Trees were still felled into the water where possible and skids rarely exceeded four kilometers in length. Heavy logs were transported over long distances by water, but lumbermen still could not tap the timber on steep mountain slopes.

By 1891 the sawmill, powered by 12 boilers, was one of the most modern steam operations at the time. The company added another 640 acres of timber limits near Sechelt to its timber supply. When the operation was sold to English capitalists for $1,000,000, 120 men worked in the mill, there were another 100 in logging camps, and 30 who were employed as longshoremen.

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68 Ibid.
69 Timber Leases 56 (January 16, 1889), timber lease 57 (February 12, 1889), Timber Lease 02 (October 7, 1889), Forestry Records Division, Victoria. Timber Lease 55 (January 10, 1888) and Timber Lease 51 (March 16 1888). Forestry Records Division, Victoria.
70 World, September 29, 1888.
The property included the Moodyville estate, consisting of 9,348 acres of freehold land, the sawmill, a hotel and 31,448 acres of timber limits expiring between 1896 and 1910.\textsuperscript{71}

Despite the size of the operation its impact on the forest was still limited. A picture of the North Shore in 1890 shows that large trees were growing at the water's edge. There were some scattered houses but the area was still densely forested (fig. 2.4). It is not certain when the company ceased to log on the North Shore, but it appears to have been during the early 1890's. The Capilano camp, for example, was closed down in September 1892.\textsuperscript{72} At that time the company was contemplating the employment of "steam loggers" on its remaining limits along the coast, because one machine could do the work of ten oxen.\textsuperscript{73}

There were nine sawmills in Vancouver in 1891; the Hastings and Moodyville mills were the largest operations. The Moodyville company continued to rely on the Pacific rim markets. In 1896, for example, it exported a total of 16,038,930 feet of lumber to South America, Australia and China. The value of these shipments amounted to $127,116.\textsuperscript{74} The new mills, by contrast, tended to supply the growing local market with manufactured wood products.\textsuperscript{75}

\textsuperscript{71} Memorandum and Articles of Association of the Moodyville Lands and Sawmill Company, Limited, incorporated on June 20, 1891. PABC GR 1583 Box 21 For. 68.
\textsuperscript{72} Advertiser, September 28, 1892.
\textsuperscript{73} World, November 14, 1892.
\textsuperscript{74} R. E. Gosnell, The Yearbook of British Columbia (Victoria: 1897), p. 242.
Fig. 2.4 The North Shore of Burrard Inlet in 1890
(Vancouver Public Library)
Towards the end of the 19th century both market destinations and forest products began to change. As large numbers of immigrants began to settle the Canadian Prairies, the Canada Lumberman noted that "Eastern shipments now form[ed] quite an item in the local trade. Cedar shingles especially [were] in demand from the East." But the Moodyville sawmill never made the transition from Pacific Rim markets to rail exports and shingle production. New Westminster mills were the main suppliers. Still, shingle operations did exploit North Shore timber. A small company, the Spicer Shingle Mill, Company Limited began cutting shingle bolts in the area in 1895. Because Lynn Creek with widely fluctuating water levels could not be used for log running, Spicer built a flume to bring down cedar bolts to tidewater. It ran from present-day Dempsey Street to the mudflats beside Moodyville from where the bolts were taken across the Inlet to the company's mill at False Creek, which had a daily cutting capacity of 30,000 feet.

In 1897 Spicer sold his North Shore limits to the Hastings Shingle and Manufacturing Company. Late in 1898 this company constructed a camp on 2nd Street, west of Lonsdale Avenue, to cut burnt cedar after the big forest fire of September that year. The camp on the banks of Mee Creek consisted of several shacks and a barn for the horses. Three loggers from Nova Scotia were in charge of it; in total ten men worked at the camp. The horses hauled out the shingle bolts on sleds. Robert and James McNair, the company owners, extended the flume up Lynn Creek. The shingle bolts were taken across Burrard Inlet to their mill on the south shore. In 1899 the company bought timber limit #12 west of Lynn Creek from the Moodyville Sawmill Company.

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76 Canada Lumberman, March 1889, p. 6.
77 The company was dissolved in July 1900.
78 A shingle bolt is a short section of a log from which shingles are manufactured.
which contained much valuable cedar although it had been cut over during the late 1870’s.

The logging activities of these early shingle companies were carried out on a small scale and with relatively primitive technology. The spatial pattern of lumbering had not changed significantly; they mainly logged on timberland previously owned by the Moodyville Sawmill Company and did not penetrate steeper terrain than the pioneer lumbermen. Yet they differed from the pioneer operation because they used a flume to carry shingle bolts and they cut lumber considered worthless by earlier lumbermen. Neither company operated very efficiently because they had to transport the shingle bolts across the inlet to their mills. It was not until the early twentieth century that a new spatial pattern of the shingle industry emerged on the North Shore: the movement of the mill to the timber and the penetration of steeper terrain.
Table 2.1 Timber Leases of the Moodyville Operation

<table>
<thead>
<tr>
<th>Lease No. &amp; Date</th>
<th>Location</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>65: Jan. 1866</td>
<td>North Shore</td>
<td>5,000</td>
</tr>
<tr>
<td>52: June 1870</td>
<td>N./S. Shore</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Port Moody</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Squamish River</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Malaspina</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Jervis Inlet</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td><em><strong>TOTAL</strong></em></td>
<td>11,410.5</td>
</tr>
<tr>
<td>53: Jan. 1875</td>
<td>1. Seymour River</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>2. Deep Cove</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td>3. Narrows Arm</td>
<td>580</td>
</tr>
<tr>
<td></td>
<td>4. Narrows Arm</td>
<td>351</td>
</tr>
<tr>
<td></td>
<td>5. Jervis Inlet</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>6. Princess Royal Reach</td>
<td>447</td>
</tr>
<tr>
<td></td>
<td>7. Van. Bay</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>8. Scotch Fir Point</td>
<td>625</td>
</tr>
<tr>
<td></td>
<td>9. Jervis Inlet</td>
<td>801</td>
</tr>
<tr>
<td></td>
<td>10. no lease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Gower Pnt.</td>
<td>1,065</td>
</tr>
<tr>
<td></td>
<td>12. Lynn Creek</td>
<td>1,460</td>
</tr>
<tr>
<td></td>
<td>13. Malaspina</td>
<td>3,510</td>
</tr>
<tr>
<td></td>
<td>14. Porpoise Bay</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td><em><strong>TOTAL</strong></em></td>
<td>10,162</td>
</tr>
<tr>
<td>54: Nov. 1884</td>
<td>Malaspina</td>
<td>1,947</td>
</tr>
<tr>
<td>50: Feb. 1886</td>
<td>lots &quot;J&quot;, &quot;K&quot;</td>
<td>7,825</td>
</tr>
<tr>
<td>55: Jan. 1888</td>
<td>Malaspina</td>
<td>1,433</td>
</tr>
<tr>
<td>51: March 1888</td>
<td>Malaspina</td>
<td>800</td>
</tr>
<tr>
<td>56: Jan. 1889</td>
<td>Sayward</td>
<td>2,699</td>
</tr>
<tr>
<td>57: Feb. 1889</td>
<td>lots 679-681</td>
<td>2,872</td>
</tr>
<tr>
<td>02: Oct. 1889</td>
<td>lots 767, 769 &amp; 44</td>
<td>2,050</td>
</tr>
<tr>
<td>63: Feb. 1891</td>
<td>Sechelt</td>
<td>640</td>
</tr>
<tr>
<td>74: Jan. 1892</td>
<td>Malaspina</td>
<td>826</td>
</tr>
<tr>
<td>58: July 1892</td>
<td>lot 1531</td>
<td>840</td>
</tr>
</tbody>
</table>
Chapter 3: North Shore Shingle Companies and Small Combination Enterprises

After the turn of the century British Columbia's forest industry was boosted by the rapidly growing shingle sector. In 1886 the government's revenue from the forest resource amounted to $3,768. By 1905 it totalled $578,748. In part this dramatic increase was explained by the growth of the lumber industry in the interior and the development of the shingle sector.\(^{81}\)

This rapid growth of the shingle sector was aided considerably by the ingenuity of local shingle machine producers. They designed machines capable of producing high quality shingles which secured British Columbia an important market share in the Eastern United States.\(^{82}\) Horizontal sawing machines developed in the East were modified and the "upright" shingle machine became the successful local design.\(^{83}\) Western red cedar was the predominant species used in the shingle sector, due to its durability, relative strength and straight grain which facilitates splitting. British Columbia shingles quickly gained a high reputation and people in the industry spoke of the product with pride:

*The excellence of our manufacture has not only obtained for British Columbia the trade throughout Canada, but has gained for them the preference in the U.S.*\(^{84}\)

British Columbia produced an increasing portion of Canada's shingles after 1890, and the number of mills in the province rose from 9 to 93 between 1891 and 1916. By 1908 British Columbia accounted for half of the country's production, and in 1921, for 80 percent.\(^{85}\) Over 90 percent of the shingle production came from the South Coast.

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\(^{83}\) Letson and Burpee Limited and the Schaake Machine Works, Limited were most important innovators and producers of upright shingle machines. Ibid.

\(^{84}\) H. N. Whitford and R. D. Craig, opus cit., p. 166.

The pattern of forest exploitation on the North Shore of Burrard Inlet changed significantly after the turn of the century. The industry was no longer dominated by one large, integrated sawmill: new small companies pushed into steeper terrain. They were spawned by the expanding shingle market and the low capital requirements of the shingle industry and encouraged by the easy availability of timber licenses. These small companies were extremely vulnerable to natural disasters, especially forest fires, as well as market fluctuations. Overproduction was a chronic problem in the shingle sector and caused shingle prices to fluctuate widely. Typically these were short lived companies which operated for a few years and then vanished. Shingle bolts were cut all year round, except during times of high snowfall or economic depression. These companies did not invest heavily in logging technology. Steam donkeys generally constituted the most mechanized pieces of equipment in the woods. Traditional methods of transporting shingle bolts by flume or horse persisted until the early 1920's.

Shingles were produced in two types of mills: those cutting shingles only and combination mills with both shingle and lumber production. Because both types existed on the North Shore, a clear distinction between lumber and shingle operations is not always possible. Combination mills with little capital (less than $50,000) are included in the shingle section, because they possess the corporate characteristics typical of small shingle operations at the beginning of this century. Early 20th century operations were concentrated along the lower reaches of the Capilano River, Lynn Creek, the Seymour River and at Deep Cove (fig. 3.1).

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In the Capilano area shingle cutting continued for relatively few years; in the Lynn Creek Valley it was a relatively important local business for two decades; and exploitation in the Seymour area was piecemeal and is poorly documented. Little is known about the Deep Cove area, except that the Robert McNair Shingle Company, Limited was operating a shingle bolt flume at the beginning of this century on District lot 800. Between 1916 and 1920 three lumber and shingle companies operated in West Vancouver, but all had ceased production by the early 1920's. Many individuals were cutting shingles on a very small scale, but because documentation of their activities is extremely limited and sketchy, they are not included in this study.

Companies and enterprises:

The red cedar stands of the Capilano Valley offered high quality timber, but were difficult to reach because two narrow canyons, cut into granitic bedrock during isostatic rebound after glaciation, bottle up the valley. An early report described the Capilano Valley as

...heavily timbered with the huge trees peculiar to the British Columbia Coast, Douglas fir, cedar, hemlock, spruce, balsam and white fir being in abundance. The Douglas fir and cedar grow to an enormous size; one cedar in particular was...found to be 64 feet in circumference, 4 feet from the ground.

American lumbermen visiting Vancouver after the turn of the century had observed that the Capilano area contained some of the "finest cedar they ever saw" but they refused to invest in it because it was too expensive to haul out the lumber. The whole idea, they concluded, was a "balloon proposition". It was a group of Vancouver business men and

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87 The Robert McNair Shingle Company, Limited. Additional Manuscript 593, Vancouver City Archives. See also Lumberman and Contractor, May 1906, p. 19.
lumbermen, associated with several companies, who eventually built a shingle bolt flume from Sister’s Creek through the two canyons to Burrard Inlet.89

The Burrard Inlet Flume and Boom Company, Limited initiated construction.90 Surveys for the flume route began the same month. It descended the West bank of the Capilano, a distance of about 7.2 km from Sister’s Creek, to the second canyon, the present site of Cleveland Dam.91 By June 1905 the Burrard Inlet Flume and Boom Company’s flume section was completed.

At the same time Dr. Carroll, a physician from North Vancouver, constructed the second flume section from the Second Canyon to Burrard Inlet. He undertook this project with two partners, Messrs. K. Holgate and W. T. Farrell. Dr. Carroll owned extensive timber tracts along the lower part of the Capilano River and employed Indians from the Capilano band to construct the flume. Both parties, Dr. Carroll and the Burrard Inlet Flume and Boom Company, had agreed to complete the difficult part through the second canyon together and had formed the Capilano Flume Syndicate. After completion both parties were to share the flume.

The lumber for both flume sections was supplied by the Capilano Lumber Company, incorporated in 1902 by Vancouver lumbermen McPhearson, W. Farrell, A.T. Tregent and G. Wilson. They leased 2,840 acres of timber limits for a 20 year period from the Capilano Park Company, at a price of $15,000.92 The limits of the Capilano Lumber Company, expanding

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89 These companies included the Burrard Inlet Flume and Boom Company, Limited, the Capilano Lumber Company, the Capilano Flume Syndicate, the Capilano Flume and Boom Company and Dr. J. T. Carroll.
90 The Burrard Inlet Flume and Boom Company was incorporated in 1902 with a nominal capital of $50,000. Company Records PABC QE 809, roll 5.
91 A railway was never considered by the company. According to Mr. Woods, one of the company owners, the limits did not contain enough timber to warrant a railway at an estimated cost of $175,000. Province, July 10, 1902.
92 This company was formed in 1892 with the intention of transforming the Capilano area into a park with hotels and various tourist attractions. It held 4,626 acres of timberland in
upstream from the Vancouver waterworks dam for 8 km, contained some 110 million feet of clear cedar and 25 million feet of fir.93 The owners constructed a small saw mill near the waterworks dam with a cutting capacity of 6,000 feet of lumber daily (see fig. 3.1).94 The mill cut lumber for the Capilano flume from this central location, which greatly reduced transport costs. The Capilano Lumber Company also sold lumber and shingle bolts to mills at False Creek. Until the flume was finished the operation transported its lumber products on a wagon road parallel to the city's water main on the east side of the Capilano River. In the years 1904/05 the small operation made a profit of $35,000. The company intended to construct a mill with a capacity of 25,000 feet of lumber and to establish a large camp near the mill by 1906. The owners had already made arrangements with a Puget Sound lumber firm to purchase their lumber products.95 These plans, however, were never realized and by 1907 the mill still had a daily capacity of only 6,000 feet.96

The flume was completed in February 1906 and was almost 14 km long. Work had been carried out during the previous summer with three gangs of men constructing different sections. The Capilano Flume Syndicate planned to transport its own shingle bolts as well as those cut by loggers holding small limits scattered along the Capilano River. Since one of the Capilano Lumber Company's owners, W. T. Farrell, was also a partner in the Capilano Flume Syndicate, it is almost certain that the lumber company did not have to pay to use the flume. A contemporary trade journal announced: "they [the Capilano Flume Syndicate] will be able to handle an enormous amount of ... work and

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93 Ibid.
94 BC Sessional Papers, 1904.
95 Lumberman and Contractor, November 1905, p. 20.
bring down safely to salt water the vast areas of timber for a distance of ten miles from the [salt] water held by private parties.\textsuperscript{97}

In the spring of 1906 the Capilano Flume Syndicate was dissolved. The Burrard Inlet Flume and Boom Company merged with Messrs. Carroll, Houlgate and Farrell to form the Capilano Flume and Boom Company. The Burrard Inlet Flume and Boom Company brought District Lot 792, a water record of 250 inches from the west fork of Sister's Creek, timber licenses 5633 and 5634, and its flume section to this new partnership.\textsuperscript{98} Messrs. Carroll, Houlgate and Farrell transferred their flume section to the new company and it was incorporated with a total capital of $100,000.\textsuperscript{99} By this time the entire bed of the Capilano River was in private hands and some $250,000 was tied up in timber limits and in the flume.\textsuperscript{100} By May 1906 the Capilano Flume and Boom Company was "bringing down bolts from the high reaches of the Capilano," and was said to be "one of the chief sources of supply for bolts."\textsuperscript{101} Figure 3.2 shows a pile of shingle bolts by the flume ready to be floated to tidewater. In November 1906 the company was dissolved. It could not be determined from the company records what lead to the termination of the company.

\textsuperscript{97} \textit{Lumberman and Contractor}, August 1905, p. 25.
\textsuperscript{98} The Burrard Inlet Flume and Boom Company's flume section ran from lot 1784 to lot 604.
\textsuperscript{99} PABC Company Records, Capilano Flume and Boom Company. B 4433, File no. 1473.
\textsuperscript{100} \textit{Lumberman and Contractor}, May 1905, p. 11.
\textsuperscript{101} \textit{Lumberman and Contractor}, May 1906, p. 7.
Fig. 3.2 Pile of shingle bolts by Capilano flume.
(UBC Special Collections)
At the same time American interests began to enter the Capilano Valley and other areas of the province. The timber legislation of 1905 sparked a boom in timber speculation, and by 1907, some 75 percent of all British Columbia timber licenses were in American hands. In 1906 the Capilano Lumber Company sold 200,000,000 feet of timber on lots 874 and 875 to Bellingham capitalists for $36,500.\textsuperscript{102} The Bellingham company announced ambitious plans to cut lumber on a large scale. Thus far, they claimed, "systematic logging" had never been carried out in the Capilano area, and only small amounts of cedar "of the very finest quality" had been cut.\textsuperscript{103} The American owners ostensibly planned to spend $1.5 million on a railway and a mill. Suddenly the timber in the Capilano Valley was going to be accessible and lumbermen with small holdings began to speculate on the railway. The \textit{Lumberman and Contractor} predicted that:

\begin{quote}
Logging camps along the headwaters of the Capilano promise to become quite numerous, if the plans of those who own small holdings of fine timber there materialize... they too are making plans to get out timber, which, at the present state of the lumber market, promises to bring better prices than have ever prevailed in the history of the West\textsuperscript{104}
\end{quote}

The lumber camps of the Bellingham company were to be established in the following spring. A sawmill plant was ordered from the American east coast for $25,000.\textsuperscript{105} No time was to be wasted and the syndicate intended to have all the lumber cut before the 10-year lease expired. The company already had plans for the Capilano Valley after logging: it could simply be colonized for farming.

The plans of the Bellingham company were never realized. It sold its holdings to an Everett syndicate in 1907, which paid $125,000 in cash.\textsuperscript{106}

\begin{footnotes}
\item[102] \textit{Lumberman and Contractor}, December 1906, p. 11.
\item[103] \textit{Ibid}, p. 12.
\item[104] \textit{Lumberman and Contractor}, December 1906, p. 30.
\item[105] \textit{Lumberman and Contractor}, February 1907, p. 13.
\item[106] \textit{Lumberman and Contractor}, October 1907, p. 7.
\end{footnotes}
In the fall and winter of 1907 the lumber industry was hit by a severe depression. Lumber prices had been boosted after the 1906 earthquake in San Francisco, but this economic high in the industry was short-lived. The A.B. Nickey family from Chicago took advantage of low timber prices and acquired timber on District lots 874 and 875, as well as timber rights for lots 1284 - 1295 from the Capilano Park Company. The total price for these 4000 acres of valuable timber only amounted to $87,500.

The Nickey family had previously been involved in the lumber industry of the mid-western states and now turned to the vast timber resources of the Pacific North West. They incorporated the Capilano Timber Company, Limited, with a capital of $300,000 in August 1908. Business men from Indiana and Tacoma, Washington held shares in the company. Only a single share was held by a native of British Columbia, the company's attorney in Vancouver. The head office was in Chicago. The company remained inactive until 1917, when the price of red cedar increased and the right technology was available to exploit the timber on a large scale with a logging railway.

Vancouver's most important watershed was controlled by foreign owners who held timber licenses under speculation, anxiously awaiting better market conditions.

Timber limits in the Lynn Valley area were largely in Canadian hands and speculation was not as evident as in the Capilano Valley. The Hastings Shingle Manufacturing Company had been cutting shingle bolts in the area since 1897. Rice Lake served as a storage area for bolts, which were carried to tide water by a V-shaped wet flume. In 1903 the company

108 The activities of the Capilano Timber Company are discussed in detail in the following chapter.
109 A wet flume was usually a V-shaped trough [sometimes box-shaped], partly filled with running water, designed to carry bolts, logs, lumber or poles.
constructed a lumber and shingle mill on the North Shore, later known as the "Upper Mill" (located at present-day Mill Street). The sawn lumber was flumed over 7.2 km to Moodyville, whence it was towed to Vancouver. The Hastings Shingle Manufacturing Company also constructed a "Lower Mill" at the present junction of Lynn Valley Road and Mountain Highway to cut shingles (see fig. 3.1).

The company continued to cut cedar bolts from burnt trees on Timber Lease number 12. George McInnes, who worked for the Hastings Shingle Manufacturing Company in 1906, remembered that "they were taking trees from a big old burn. The trees were all dead with no bark on them, but sound as a dollar except for the odd worm hole." During the same year another fire raged in the Lynn Valley area. The mills and the camp were saved, but shingle bolts valued at $6,000 were destroyed.

The main camp was located near the "Lower Mill" at Hastings Creek and consisted of bunkhouses, stables and the houses of early settlers. By 1906 two hundred men were employed at the camp. Unlike the temporary, isolated logging camps along the coast, where women were rarely seen, the lumbermen and mill workers started to bring in their families. Julius Fromme, mill-manager of the Hastings Shingle Manufacturing Company, recognized the importance of the growing real estate business. He had pre-empted District lot number 2023 in 1899 with permission of the company, which held a timber license on the land. Fromme subdivided the land into 60 blocks and sold it to

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111 Various fires broke out when the Moodyville Sawmill Company logged the area in the late 1870's and the fire of 1898 did substantial damage.
115 Julius Fromme was originally from Nova Scotia and spent three years travelling across the continent, working in the woods. Once in British Columbia, he cut railway ties for the CPR construction and finally decided to stay in Lynn Valley.
company workers. Thus logging and real estate transactions were closely linked because of the proximity of Vancouver, and "cultivation [was] fast following at the heels of the woodsmen".\textsuperscript{116}

A second logging camp was at Rice Lake and employed about 60 men. The Hastings Shingle Manufacturing Company held various timber rights along the Seymour River. A main skid ran on the east side of the stream to an elevation of about 900 meters to tap valuable stands of yellow cedar. A third camp was located there, but little is known of it. More than likely, horses and steam donkeys were used to move the logs down the mountain side, but it is not certain how they were brought to tidewater.

In 1906 the Hastings Shingle Manufacturing Company announced its plans to tear down the "Upper Mill". Julius Fromme and Thomas Allan decided to take over the mill and it was agreed that they should run it on a two-months-trial basis. Two months later, on January 2, 1907 Thomas Allan and Julius Fromme, partners in the new "Lynn Valley Lumber Company", agreed to acquire "the sawmill and the property therein for $10,000" from the Hastings Shingle Manufacturing Company.\textsuperscript{117} The purchase included one 9x10 yarding donkey engine, with 500 feet of "wire", and four city blocks (lots 119, 120, 153, 154 of District Lot 2169).\textsuperscript{118}

\textsuperscript{116} *Express*, May 11, 1906, p. 1.
\textsuperscript{117} PABC Lynn Valley Lumber Company Records.
\textsuperscript{118} Ibid.
Fig. 3.3  Lynn Valley Lumber Company's Mill (North Shore Archives)
The Lynn Valley Lumber Company's mill had a daily cutting capacity of 10,000 feet and produced 700,000 feet in 1907.\textsuperscript{119} The company's timber limits were located west and north of the mill (District Lots 801, 803, 869, 881, 2028), on the lower slopes of Lynn Ridge and in the south-western corner of what is today Lynn Headwaters Park. Over the following years Fromme overhauled the mill and expanded its capacity: he added a factory to the original sawmill, established dry kilns and "systematized the business generally".\textsuperscript{120} By 1911 the capacity of the sawmill was 25,000 to 30,000 feet of lumber per day. The output of the mill and the number of employees fluctuated with local demand. During busy times the mill employed 40 to 60 men, producing lumber, flooring, frames and cedar shingles. The saw- and shingle mill was operated by steam and the factory by electricity.

The investment in the new mill was worthwhile and the company supplied new residents with building materials. But in 1913 the Lynn Valley Lumber Company felt the economic crunch of the pre-World War I depression and the sawmill remained idle.\textsuperscript{121} Despite the continued depression in the lumber industry the shingle plant was running day and night in 1914 to cope with the increased demand for shingles "occasioned by the many new dwellings in course of erection in the outlying districts".\textsuperscript{122} In February 1915 the company shipped 1,600,000 shingles to New York in a Robert Dollar line vessel.\textsuperscript{123} By 1916 the company employed 26 workers and the mill produced 100,000 shingles per 12 hour day.\textsuperscript{124} In 1918 the output was up to 125,000 shingles and a night gang worked at the shingle plant to meet the demand.\textsuperscript{125}

\begin{itemize}
\item \textsuperscript{120} \textit{The Express}, Easter Development edition 1911.
\item \textsuperscript{121} \textit{Western Lumberman}, November 1913, p. 60.
\item \textsuperscript{122} \textit{Western Lumberman}, March 1914, p. 40.
\item \textsuperscript{123} \textit{Western Lumberman}, February 1915, p.
\item \textsuperscript{124} \textit{ABC Lumber Trade Directory} 1916/17.
\item \textsuperscript{125} \textit{Western Lumberman}, September 1918, p.37.
\end{itemize}
The company still employed 26 workers. In 1920 the post-war boom was levelling out and the daily output was reduced to 50,000 shingles with 10 men working at the mill and 16 in the woods.\textsuperscript{126} By 1923 the operation started to wind down and the number of employees was decreased significantly: 6 men worked at the mill and only 4 in the woods.

Although the company started out by producing both lumber and shingles, red cedar shingles apparently dominated production in the years after World War I. Reports on company production in the \textit{Western Lumberman} and the \textit{ABC Lumber and Trade Directory} focus exclusively on shingle production. This was mainly due to the company’s timber supply: according to Harold Fromme the prime timber was taken out by 1915-16.\textsuperscript{127} Thus the Lynn Valley Lumber Company had little saw timber and was limited to producing shingles. Later on the company cut second growth and used up scrap lying in the woods from earlier, wasteful logging.

The Lynn Valley Lumber Company was a small family enterprise with a total capital of $25,000 and exemplifies the numerous small sawmill and shingle operations that were scattered along the coast of Southern British Columbia at the beginning of this century. A small operation like this was very vulnerable to economic changes and natural disasters. Despite two severe forest fires in 1910 and 1920, the Lynn Valley Lumber Company stayed in business for almost 20 years and eventually had to close because it ran out of timber. In 1926, after failing for two consecutive years to send returns, notices and documents required by the Companies Act, the company was struck off the register and dissolved.

The price for shingles began to climb during World War I. and the Cypress Lumber Company, the Nasmyth Lumber Company and the Vedder

\textsuperscript{126} \textit{ABC Lumber Trade Directory}, 1920.
\textsuperscript{127} Personal interview with Harold Fromme, son of Julius Fromme, January 13, 1986.
River Shingle Company began to operate in West Vancouver. By 1916 good harvests in the prairies and higher wheat prices revived the depressed forest industry of British Columbia. The province's (current) value of shingle production almost doubled within three years: it jumped from $3,500,000 in 1915 to $6,900,000 in 1917.\footnote{Report of the Forest Branch 1918, p. 8.}

The Cypress Lumber Company was incorporated on October 5, 1916, with a capital of $10,000.\footnote{PAPC Company Records Cypress Lumber Company, Limited, no. 3198, B 5142.} The small enterprise built a shingle mill at Dundareve Station and employed 12 men.\footnote{ABC Lumber Trade Directory, 1918.} The timber limits near the mill were soon exhausted and the company acquired 3,000 acres near the top of Hollyburn Mountain. These limits contained 75 percent red cedar of "unusual quality".\footnote{Western Lumberman, February 1918, p. 42.} The new timber limits on Hollyburn mountain confronted the company with the problem of transporting the logs from the steep mountain side to the mill. Initially it constructed a dry log chute down at the steepest section of its holdings. The chute was about 1,170 meters long and the bolts had to be hauled for another kilometer to the mill. This system proved ineffective because the chute was so steep that many bolts bounced out, and the additional haul to the mill was too expensive. The Cypress Lumber Company replaced the dry flume with a wet flume, which delivered the bolts right to the mill (see fig. 3.1).

Financial difficulties forced the small company to sell out to the Nasmyth Lumber Company in the summer of 1918.\footnote{Western Lumberman, August 1918, p. 32.} This operation had exhausted its East Burnaby timber limits after 10 years of logging there and was looking for new timber limits. It became increasingly difficult to acquire easily accessible timber rights on the southern coast and Mr. Nasmyth,
company manager, bought limits near the Pacific Great Eastern Railway line, about 48 km from tidewater at Squamish.\textsuperscript{133} There he planned to erect a mill with a capacity of 40,000 feet. He constructed an additional sawmill in West Vancouver, at an elevation of 720 meters on Hollyburn Mountain. He used machinery from the old plant in Burnaby.\textsuperscript{134} The company planned to manufacture red cedar, yellow cedar, fir and hemlock products. In May 1919 the mill began to cut planks for a new flume.\textsuperscript{135} Even though the Cypress Lumber Company had constructed a new flume, it did not meet the needs of the new owners. They built a flume which could carry both shingle bolts and sawn lumber. The new flume was a little over two 3.2 km in length, linking the mountain sawmill with the shingle mill at the P.G.E. railway line at Dundareve station. From there the sawn lumber could be loaded on railcars and the bolts were processed at the shingle mill. The daily capacity of the sawmill on the mountainside was 35,000 feet of lumber daily and the shingle mill could produce 75,000 shingles per day.\textsuperscript{136}

West Vancouver residents were opposed to the flume because it crossed Marine Drive and was considered an "unsightly object."\textsuperscript{137} Public opposition was not the only handicap of the company: the shingle mill burnt down in January 1920 at a loss of $10,000.\textsuperscript{138} It was quickly rebuilt and operated again by March 1920. Insufficient water supply for the flume presented a further problem for the company and it had to close down in October 1920.\textsuperscript{139}

\textsuperscript{133} Western Lumberman, June 1918, p. 39.
\textsuperscript{134} Western Lumberman, August 1918, p. 32.
\textsuperscript{135} Pacific Coast Lumberman, June 1919, p. 66.
\textsuperscript{136} ABC Lumber Trade Directory, 1920, p. 70.
\textsuperscript{137} Western Lumberman, April 1919, p. 35. The writer of the article suggested wryly "why not try camouflage - some returned soldier might solve the difficulty."
\textsuperscript{138} Western Lumberman, January 1920, p. 46.
\textsuperscript{139} The abandoned bunkhouses near the mountain mill on Hollyburn ridge were used by skiers during the 1920's. They followed the old flume trail to the top. BC Outdoors, May 1984, p. 32.
In 1916 the Vedder River Shingle Company began to construct a large shingle mill in West Vancouver, with a capacity of 75,000 shingles per day.\textsuperscript{140} The eight acre mill site was located north of the Hollyburn Ferry landing. The shingle mill contained six Letson and Burpee Upright Shingle Machines; dry kilns and storage sheds were located beside it. The mill was powered by steam, but had electrical lighting. The company leased 1,600 acres of timberland along Brothers Creek and Cypress Creek, containing 100,000,000 feet of timber.\textsuperscript{141} Red cedar was cut into shingle bolts by 10 Letson and Burpee Upright machines and floated to the mill on a 1.6 km long flume (see fig. 3.1).\textsuperscript{142} The elevation difference between the timber limits and the mill was 270 meters. According to the owner, Robert Shields, the mill site was especially valuable because Lawson Creek passed through the property and could be dammed to form a shingle bolt collection pond at the end of the flume.\textsuperscript{143}

After Shields had invested $60,000 in timber licenses, equipment and buildings, fire and snow endangered the success of the operation.\textsuperscript{144} By early 1918 only 6 of the original 10 machines were operating. They were located high on Cypress Creek and snow caused them problems.\textsuperscript{145} In December 1919 the night shift at the mill was given up because deep snow made it difficult to keep up the bolt supply. On June 28, 1918, a bushfire got dangerously close to the mill and flume. A crew of 25 fire fighters fought the fire until morning and got in under control.\textsuperscript{146}

\textsuperscript{140} ABC Lumber Trade Directory 1920, p. 53.  
\textsuperscript{141} Western Lumberman, April 1917, p. 33.  
\textsuperscript{142} Western Lumberman, December 1916, p.16.  
\textsuperscript{143} Western Lumberman, January 1917, p. 37.  
\textsuperscript{144} Western Lumberman, March 1917, p. 25.  
\textsuperscript{145} Western Lumberman, February 1918, p.42.  
\textsuperscript{146} Western Lumberman, August 1918, p. 36.
By 1920 the Vedder Shingle Company employed 25 mill workers and 35 lumbermen to produce 150,000 shingles per day. The main markets of the operation were in Ontario. In 1923 the company was sold to the Lions Shingle Mills, Limited, which used high lead yarding and 4 donkey engines. No further entries were found in the *ABC Lumber Trade Directory* after 1926.

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147 *ABC Lumber Trade Directory*, 1920, p. 78.
148 *ABC Lumber Trade Directory*, 1923, p. 91.
**Flumes:**

All these North Shore companies chose to transport their shingle bolts and lumber by flume. Flumes were used in the Pacific North West, Eastern Canada, the Northern Rocky Mountains, California and the Southern Appalachians.\(^{149}\) They were well suited to transport bolts and small logs over relatively short distances ranging from two to sixteen kilometers in mountainous terrain. Whitford and Craig described flumes as "one of the cheapest means of log transport where there [was] sufficient quantity of timber to be taken out to justify the initial expenditure."\(^{150}\) The V-shaped flume was the most common type, because it required less water and was less prone to jams than square-sided forms.\(^{151}\) Flume construction frequently started near the upper elevations of a limit and progressed downward. A portable sawmill usually cut local lumber, which was floated down the flume under construction. Flumes were built quickly, had low maintenance costs and avoided empty return hauls. These advantages were offset by the need for a constant water supply and their limited carrying capacity. Flumes could not be used to carry in camp supplies and additional skid roads were needed. They were often destroyed by forest fires. Thus they never became a common mode of log transport and were eventually replaced by the motor truck.

The Capilano flume, measuring 14 kilometers, was the longest flume in British Columbia upon its completion in 1906 and one of the longest on the Pacific coast.\(^{152}\) It was V-shaped and had a cat walk beside it to provide easy access in case of jams (fig. 3.4).

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\(^{151}\) *Western Lumberman*, August 1914, p. 27.

\(^{152}\) *Lumberman and Contractor*, August 1905, p. 10.
Fig. 3.4  Flume running through Capilano Canyon (UBC Special Collections)
The flume was especially spectacular in the second canyon, suspended high above the Capilano River from steep rock walls. From the very beginning the project was surrounded by a controversy over water rights for the flume. The Burrard Inlet Flume and Boom Company applied several times to the Committee for Water Rights for a water license, but was initially unsuccessful due to the widespread idea that logging would cause drought and pollution. Eventually the company was granted a license of 250 inches under the River and Streams Act. The owners agreed to meet all requirements to conserve the purity of the water and to construct the flume under supervision of the City Engineer. Mr. Woods, spokesman of the operation, emphasized that it "only wanted the water for lumbering purposes and when this was exploited the claims would be abandoned."¹⁵³ The company planned to cut cedar only, thus "the forest would not be appreciably thinned".

The flume was never fully utilized. The Capilano Lumber Company, Dr. Carrall and a few small operators floated down shingle bolts. The flume was abandoned after few years of use and was removed during the 1920's to prevent accidents.

The Lynn Creek flume was easier to build and never became an issue of controversy. The Lynn Valley Lumber Company expanded the flume system to a total length of 16 km.¹⁵⁴ Part of the flume system was a dry flume chute, located north of Dempsey Street. Bolts stacked at the top of rock bluffs were tipped over the edge onto the dry chute. They raced down the chute to a collection pond below. It was a very hazardous system and several workers were injured or killed by bolts bouncing out of the flume. In May 1905 a

worker had his leg smashed by a shingle bolt at the end of the chute. In September 1906 a teamster was hit by a bolt which killed him instantly.

The flume was badly damaged during heavy fall rains in November 1911. The Lynn Valley Lumber Company did not repair the damage; residents considered the flume a "menace to the Valley" because they had to cross it frequently. Although more advanced methods of transport were available, the company chose to haul lumber and shingle bolts with horses along skid trails. A little steam donkey was used to move heavy timber to the main skid, from where it was dragged to the millsite by teams of horses (fig. 3.5).

Wet-flumes were only useful if a reliable source of water was available. The failure of two West Vancouver operations, the Cypress and Nasmyth Lumber Companies, was closely linked to a lack of water for their flume system. The Cypress Lumber Company constructed a two mile flume from Hollyburn Mountain, starting at an elevation of 579 meters above sea level. In the steep section 7.5 cm of water reduced the speed of the bolts to 24 kilometers per hour. In more level sections 12 to 15 cm of water were needed to keep the bolts floating. Even though the North Shore Mountains are a very wet region, the company faced a serious problem of water shortage. None of the nearby streams was big enough to supply sufficient amounts of water for the flume.

155 Lumberman and Contractor, May 1905, p.
156 Express, September 21, 1906, p. 1.
157 Express, March 3, 1911, p. 5.
158 Western Lumberman, January 1912, p. 41.
Fig. 3.5 Lynn Valley Lumber Company hauling logs with horses (North Shore Archives)
In March 1918 the company applied for a water record of two cubic feet to construct a small dam at an unnamed creek. Until the dam was constructed the mill remained idle because it did not have any lumber to process. These delays ultimately contributed to the closure of the company.

The Nasmyth Lumber Company took over the operation and used 24,000 feet of lumber to construct its new flume. The 3.2 km flume linking the mountain sawmill with the shingle mill at Dundareve station had 75 cm sides, brackets every 2.4 meters and measured 1.2 meters across. A period of extremely dry weather in the summer and fall of 1919 caused a severe water shortage for the wet flume. The water supply dried up, even though Nasmyth had constructed several small dams in anticipation of a drought. The company could not recover from these financial losses and folded up its operation in October. In 1923 the company was listed as being in liquidation. Thus neither operation reaped a profit from the timber on Hollyburn mountain, because they had not planned their logging operation well and had chosen the wrong mode of transport. These companies did not have sufficient capital to carry on after a natural disaster had struck.

159 Western Lumberman, March 1918, p. 33.
160 Pacific Coast Lumberman, August 1919, p. 44.
161 Pacific Coast Lumberman, October 1919, p. 36.
162 ABC Lumber Trade Directory, 1923.
Impact on the landscape:

Shingle operations on the North Shore employed relatively simple technology, yet they gradually moved into steeper terrain to cut cedar bolts. The severity of their impact on the landscape depended on the accessibility and steepness of the terrain they logged. Timber limit #12, on the lower flanks of the Coast Mountains, was within easy reach of early lumbermen and was almost clear-felled by the early 1900's. The Moodyville loggers had removed the timber selectively with oxen, later with horses and mules. They abandoned the limit some time during the 1880's and "this wilderness was allowed to recuperate from the disfiguration caused by the logger". But natural regeneration was soon disrupted by the woodsmen of the Hastings Shingle Manufacturing Company who cut about 100 cords of shingle bolts per day and left "nothing but charred stumps and spraggling twigs" in their wake. By May 1906 they had cut a "swath" almost 5 km wide and over 6 km long.

Less accessible forests at higher elevations were logged for the first time by shingle companies. Even though their activities were relatively localized, they altered the forest landscape considerably. A picture of Lynn Ridge in the 1910's shows irregular, bare patches on the lower slopes, evidence of the activities of the Lynn Valley Lumber Company. Without high lead yarding many trees were left standing; different shades of grey indicate that the forest was cut in several stages. Flumes and skidroads criss-crossed the North Shore forests and left their mark on the landscape.

It appears that the shingle cutters in the Capilano Valley, the least accessible area at the time, had the smallest impact on the forest ecosystem. The Capilano flume epitomized the contemporary belief in progress and quest for profit: no terrain was too steep and rugged for lumbermen to reach.

164 Ibid.
Commercial exploitation had finally entered this secluded valley. The selective handlogging methods of those early years, however, did not devastate the landscape and the forest on either side of the flume seemed undamaged. To one contemporary observer "the dense primeval forests of fir, cedar, hemlock, spruce and balsam" along the Capilano appeared as though they "[had] not been cut down or interfered with." An examination by the Forest Branch in 1923 showed that reproduction was very satisfactory in areas which had been "selectively logged 12 to 15 years ago for shingle bolts and ties and the forest cover [was] never entirely removed". These shingle operations represented a transition from extremely selective shoreline logging in the pioneer era to clear-cutting in the 1920's.

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165 H. M. Burwell, The Vancouver Water Supply (Vancouver: 1913), p. 3.
166 Forest Branch Report 1923. GVWD Correspondence files Vancouver City Archives, Box 64-D-2, File 2.
Chapter 4: 20th Century Lumber Operations and Large Combination Enterprises.

After 1886 British Columbia's lumber market was reoriented from almost exclusive reliance on the cargo trade to a similar dependence on Eastern markets. Despite the decline of the cargo trade there was a continuing emphasis on high quality lumber. During the early decades of the 20th century lumber production was the most important sector of British Columbia's forest industry. Lumber market conditions fluctuated as widely as did those for shingles. British Columbia lumbermen relied strongly on Canadian prairie markets and failed to build up Pacific Rim markets. This neglect had disastrous consequences when the prairie markets collapsed in 1913. Only a "thin trickle" of high grade lumber exports went to the United States, while American lumbermen flooded the Canadian prairies with low grade lumber. In 1914, for example, British Columbia shipped 40,000,000 feet of lumber to the U.S, whereas 77,000,000 feet of American lumber were sold in the Canadian prairies. \[167\]

This shortage of markets resulted in chaotic overproduction. As the Forest Branch saw it "the quality, quantity and accessibility of our provincial forests have proved an overwhelming temptation to lumbermen to enlarge their mill capacity beyond current needs." \[168\] Lumbermen operated in highly unstable economic conditions and "lumber, for the time being [became] a drug, the mills work[ed] half the time or [were] closed down, and the logging camps [were] deserted." \[169\] British Columbia's lumber industry depended on production of high grade fir, spruce, and cedar. Low grade lumber was often

\[168\] Report of the Forest Branch of the Department of Lands, 1913, p. 15.  
left to rot in the woods and the Forest Branch claimed that licensees often used only 40 percent of the timber on their limits. Wasteful logging practices were closely linked to the absence of markets for low grade lumber. The Forest Branch emphasized that the province’s timber resources could not be conserved and used efficiently unless markets for low grade lumber were established.¹⁷⁰

With the best, accessible timber gone, early 20th century lumbering on the North Shore was small scale, using animal power and steam donkeys. Lumbermen operated in increasingly difficult terrain. After World War I the demand for coastal lumber was high and North Shore logging companies used sophisticated logging equipment to get at valuable timber on steep slopes. By the 1920’s lumbering on the North Shore had become a capital intensive business and was dominated by three relatively large lumber firms. Two of these, the Capilano Timber Company and Cedars Limited, logged in the watershed areas of the Capilano and Lynn Valleys. The third operation, the Deep Cove Lumber Company, was cutting in close proximity to the Seymour watershed (fig. 4.1). Timber exploitation in the Seymour watershed itself was on a small scale, but much controversy existed over speculative, foreign ownership of timber limits. These companies employed the most advanced logging technology available at the time, which expanded the reach of their operations enormously. Their activities increased the danger of forest fires and erosion and left visible scars on the forest landscape.

The Western Corporation (later Seymour Lumber Company)

By 1907 North Vancouver had a population of about 1,500 people. One real estate company, the Western Corporation, played an important part in "opening up the dormant district of North Vancouver".\(^{171}\) The company was incorporated in 1902 with a capital of $100,000.\(^{172}\) Its business included real estate, house building, general contracting, road making and land clearing. Initially the company bought its lumber in Vancouver and towed it across the Inlet. Then, in 1906, the Western Corporation decided to construct its own sawmill on the North Shore to increase efficiency and to avoid delays in delivery. The mill was built on 17th Street, District Lot 616, with a daily capacity of 12,000 feet of lumber.\(^{173}\) Little more than a year later, in May 1907, the directors raised the company's capital to $250,000.\(^{174}\) The well known North Shore businessman J.C. Keith, who held extensive limits in the Capilano Valley, had joined the company and probably contributed considerably to the higher capitalization.\(^{175}\) The Western Corporation spoke proudly of its new sawmill:

> What was originally a small sawmill for the purpose of economically using up the big logs removed in clearing the forests and helping the building department with plenty of rough timber, is now an up to date manufacturing concern and a live industry.\(^{176}\)

The sawmill was operated almost entirely by electricity, powered by two Canadian General Electric Company Motors, one of 175 HP and one of 85 HP, and a Westinghouse Motor of 50 HP.\(^{177}\) The daily capacity was 35,000

\(^{171}\) Western Corporation Souvenir Book, 1907, PABC.
\(^{172}\) The directors were Messrs. A. F. Beasley, C. M. Sarel, R. B. Johnson and A. B. Diplock.
\(^{173}\) Lumberman and Contractor, March 1906, p. 8.
\(^{174}\) PABC Company Records, Western Corporation Limited.
\(^{175}\) J.C. Keith was manager of the Bank of British Columbia from 1886 to 1892, promoting real estate speculation.
\(^{176}\) Western Corporation Souvenir Book, 1907, PABC.
\(^{177}\) Western Lumberman, January 1908, p. 17.
feet of lumber; the logs were pulled from the mill pond along a gangway into
the mill, placed onto a saw carriage and were cut by two 56-inch saws.\textsuperscript{178} It
was one of the most modern industrial plants on the North Shore. A.B.
Diplock, one of the directors, invented a portable refuse burner for the mill,
which was later patented. Some of the logs were too large for the twin saws
and were simply split in half with blasting powder.\textsuperscript{179} In May 1907 the new
mill was almost destroyed by a forest fire which burnt 50 cords of wood
nearby.

Eighty men worked for the operation; bunkhouses, offices,
cookhouses and stables were constructed around the mill site. The workforce
consisted of Europeans, Canadians, Americans and Asians. The latter group
worked exclusively at the mill. The company employed relatively simple
transport technology in the woods. A steam donkey dragged the heavy logs to
the main skid, whence six teams of horses hauled them to the mill (fig. 4.2).
The mill output, by contrast, was carried to tidewater by one of the most
modern means of transport at the time, the BC Electric Railway. Its line ran
right up to the mill site.

\textsuperscript{178} \textit{Express}, June 28, 1907, p. 1.
\textsuperscript{179} T. Diplock, "Some recollections of early days in the sawmill business on the North
Shore." Unpublished manuscript North Shore Archives, no date. Note: Thomas Diplock
was the son of A. B. Diplock, one of the company directors.
Fig. 4.2  Diplock's logging crew beside donkey engine (North Shore Archives)
In October 1909 the Western Corporation was reorganized as the Seymour Lumber Company, with a reduced capital of $100,000. Two of the directors of the Western Corporation, A. Diplock and C. Sarel, were on the board of directors of the new company. It appears that the reorganization was related to financial difficulties. The Western Corporation's property and mill had been taken over by the BC Trust Corporation, which resold it to the Seymour Lumber Company. It purchased "four horses named Dan, Jim, Pet and Charlie, four waggons, all harness used for said horses, two donkey engines and cable, pulleys, ropes, hooks and all tools, fittings and applications forming... a logging outfit, one 50 horsepower motor and one 185 horsepower motor...". The new company bought the Western Corporation's mill at an elevation of 120 meters above sea level. In addition it acquired timber rights at elevations exceeding 600 meters on Fromme Mountain, east of Grouse Mountain. The timber rights on lot 1342 in the Lynn Headwaters area were probably obtained for speculative purposes, because this parcel of land was too far from the mill for economic exploitation with the technology at hand.

By 1911 the Seymour Lumber Company had exhausted its timber supplies near the mill and began to tap its limits on Mount Fromme. The company constructed a 3.5 meter wide plank road at a cost of $35,000 to connect the mill with the timber limits, where a portable sawmill produced rough sawn lumber. It was hauled along the steep 5.6 km plank road to the sawmill for finishing and drying. The trip proved difficult for the horses and the company simply moved the mill operation closer to its timber limits. The

180 "Seymour Lumber Company" is a somewhat misleading name, since the company had no limits in the Seymour Valley.
181 PABC Company Records, no. QE 2584, Seymour Lumber Company Limited.
182 PABC Company Records, no. QE 2584, Seymour Lumber Company Limited. The sale included: westerly acres of DL 869, the timber on DL 1342 and several lots on District Block 616 (lots 1 - 4 in block 7, lots 7 and 8 of lot 14, lots 38 - 44 and lot 73 in block 6 of DL 616.
183 PABC Company Records, no. QE 2584, Seymour Lumber Company.
company built a saw and shingle mill in the forest and a planing mill right on St. George's Avenue. Rough lumber coming down from the main mill was finished at the planing mill, whence it was delivered to various construction sites on the North Shore. The Western Lumberman reported that the company also had a "large rail trade with the Pacific North West", but did not specify what percentage of their output was exported.\textsuperscript{184} Several orders went to New Zealand and England. The operation manufactured "lumber, lath and shingles, kiln dried flooring and finishing lumber".\textsuperscript{185}

In May 1912 a bushfire destroyed the saw and shingle mill and a pile of lumber valued at $10,000. The timber limits in the vicinity of the mills were completely burnt and the total loss exceeded $50,000.\textsuperscript{186} The 120 employees could not stop the fire. The company could not recover from this disaster and folded up its operation. In November 1912 the machinery was removed from the ruins of the mills and sold to the Vancouver Machinery Depot.\textsuperscript{187} The planing mill was bought by Anderson and Pearse in 1913, who transformed it into a shingle mill.\textsuperscript{188} No further mention of the operation was found, but it is likely that it did not survive the economic depression of that year.

The Western Corporation (later Seymour Lumber Company) used steam and animal power to transport its logs. Its hauling system represents a transitional stage from crude, unmechanized methods to powerful steam logging machines. This transport system necessitated the movement of the mill to the timber and put lumber operators at a higher risk in case of forest fires, because mill and timber limits were on the same grounds. By 1912 fire

\textsuperscript{184} Western Lumberman, March 1910, p. 36.
\textsuperscript{185} PABC Company Records, no. QE 2584, Seymour Lumber Company.
\textsuperscript{186} Western Lumberman, June 1912, p. 33.
\textsuperscript{187} Western Lumberman, November 1912, p. 49.
\textsuperscript{188} Western Lumberman, July 1913, p. 53.
protection in British Columbia was considered one of the most important tasks of the new Forest Branch and a fire protection program was established.\textsuperscript{189} Neither the industry nor the government could ignore this aspect of conservation; forest fires, often caused by careless logging methods, destroyed huge amounts of valuable timber every year. The Forest Act of 1912 required a fire patrol system based on forest districts and a forest protection fund was set up. Private holders of timber land were required to pay one cent per acre.\textsuperscript{190} Despite these efforts lumber companies were often poorly prepared for forest fires and the Forest Protection Branch was still in a formative stage.


\textsuperscript{190} In 1913 the rate was increased to 1.5 cents per acre.
The McNair Timber Company (McNair-Fraser Lumber Company)

Only a few kilometers west of the Seymour Lumber Company a West Vancouver Lumber Company experimented with advanced steam logging methods. The McNair Timber Company, Limited held timber limits on the eastern side of Hollyburn Ridge, where the British Properties are now located. The company was incorporated by Robert and James McNair in 1906 with a capital of $100,000. The two brothers had left New Brunswick in 1891 and came to British Columbia. They soon became important figures in the local lumber industry.

In March 1907 the McNairs started to construct a standard gauge railway line from the foot of 16th Street to their limits. They needed more capital to finance the railway and entered a partnership with three other people in May 1907. The company was renamed the McNair-Fraser Lumber Company Limited with an increased capital of $200,000. The new shareholders were Graham Fraser from New Glasgow, Nova Scotia, Joshua Peters from Moncton, New Brunswick and Russel L. Fraser from North Vancouver.

Work on the rail grade progressed quickly and was compared to a section of the CPR by an enthusiastic writer of the Vancouver Province. It

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192 They also owned the Hastings Shingle Manufacturing Company and were logging in the Lynn Valley area.
193 PABC Company Records, no. QE 1797, McNair-Fraser Lumber Company Limited.
194 Graham Fraser was an important figure in the Nova Scotia steel industry. From 1889 to 1904 he was president and managing director of the Nova Scotia Steel and Coal Company, one of the largest industrial operations in Canada at the time. T. W. Acheson, "The National Policy and the Industrialization of the Maritimes, 1880-1910," in Atlantic Canada after Confederation, ed. P. A. Buckner and D. Frank (Fredericton: Acadiensis Press, 1985), p. 183.
195 Vancouver Province, June 2nd 1907.
was as steep as 22 percent, in particular near Hollyburn Ridge, and climbed to an elevation of 1,600 feet. The McNairs decided not to use rail cars for holding the logs. Instead the logs were to be chained together and dragged over the cross timbers, a rather crude method of log transport. The company had purchased a new 45 ton Heisler locomotive from Erie, Pennsylvania, built in November 1906. The Heisler locomotive had a center drive shaft and rode well on poor tracks, possibly the reason for the McNairs' choice of this model.\(^196\) The advent of steam logging railways on the North Shore of Burrard Inlet as elsewhere in British Columbia, changed the scale of production and environmental impact.

The company established two comfortable camps beside the railtrack for its workforce. The lower camp was located near 11th Street and consisted of a cookhouse, a dormitory and a large stable. The Upper Camp, with a large blacksmith shop, a cookhouse, a dining room and three bunk houses, was 2.5 kilometers above it.\(^197\)

On June 2nd 1907 the locomotive made its first trip to the upper limits. On the return trip the rail grade proved too steep for the locomotive and it began to skid down out of control. The crew jumped off without injury but the locomotive left the tracks on a corner and was "scattered through the woods".\(^198\) After this accident the company searched for a machine that could cope with the steep grade and did not require an alteration of the roadbed. About $45,500 had been spent on the main roadbed and the shareholders did not want any additional expenses.\(^199\)

The Willamette Iron and Steel Works of Portland, Oregon, provided the solution to the company’s problems. They had invented a logging

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\(^{197}\) *Vancouver Province*, June 2nd 1907.
\(^{198}\) Ibid.
\(^{199}\) PABC Company Records, no. QE 1797, McNair-Fraser Lumber Company Limited.
locomotive called the **Walking Dudley** "intended to overcome the difficulty of runaway locomotives and other dangers of steep grades".\textsuperscript{200} Russel L. Fraser, one of the shareholders of the McNair-Fraser Lumber Company, had seen this machine in operation by the O.K. Lumber Company at their camp in Marshland, Oregon, and decided to have one built for the West Vancouver operation.\textsuperscript{201}

The Walking Dudley was basically a cross between a steam donkey and a locomotive:

\begin{quote}
The new device is a donkey engine set up on a specially constructed steel flat car, and hauling itself up and down the grade by means of a couple of stationary cables winding and unwinding on the drums, or "bull-wheels" of the engine. The machine is designed to operate on a standard gauge railroad with grades up to 25 percent. Two one inch steel cables are laid along the track just outside of the rails and are put under tension and secured at both ends of the road.... When the track is curved the cable is held in position by wooden pins about 3 or 4 inches in diameter...\textsuperscript{202}
\end{quote}

The engine’s boiler was 190 cm in diameter and 345 cm tall. Power was transmitted via a differential to two drums on either side of the machine. The cable looped several times onto these drums. The differential allowed them to revolve at different speeds. This was necessary to equalize the pull on the cables when going around corners. It appears that the company had ceased to log until the "Walking Dudley" arrived in 1908 (fig. 4.3). Cables were laid on both sides of the railway tracks, starting at the Hollyburn Wharf and extending to the upper end of the tracks. The cable almost doubled the cost of the machine: in 1910 the locomotive was valued at $6,604, the cable was worth $5,006.\textsuperscript{203}

\textsuperscript{200} *Western Lumberman*, January 1909, p. 32.
\textsuperscript{201} *Western Lumberman*, August 1911, p. 43.
\textsuperscript{202} *Western Lumberman*, January 1909, p.43.
\textsuperscript{203} PABC Company Records, no. QE 1797, 1910, McNair-Fraser Lumber Company Limited.
Fig. 4.3 Walking Dudley hauling logs to tidewater - Camp in background. (Vancouver City Archives)
The Walking Dudley had a 4 men crew: a driver, fireman, chaser and greaser. Even though the greaser lubricated the dragging logs, friction was so great that the logs were often smoking by the time they reached the water. The Walking Dudley made 4 round trips every 10 hour shift, dragging 10 to to 16 logs each time. In a record month 1,250,000 feet of lumber were hauled to tidewater.\textsuperscript{204} In 1910 the McNair-Fraser Lumber Company employed 45 men.\textsuperscript{205} The logging outfit was completely mechanized and used 4 steam engines: a stationary yarder engine, a swing engine, a roader engine and the Walking Dudley.\textsuperscript{206} Joseph Gregson, a former employee, described the operation (see fig. 4.4):

\begin{quote}
The yarder hauled the logs from the woods. The swing engine hauled them about 350 yards from the yarder to where the roader could hook on. A turn of the logs was made up at the swing engine, and varied from 16 to 20 logs according to size. They were fastened together, one behind the other, with grabs. A set of grabs consisted of four, and were driven into each side of the log, two in the front log, two in the one behind. The roader hauled these logs about three quarters of a mile so that the Walking Dudley could hook on and take them down to the sea. The logs ... were hauled in between the rails on the ties to saltwater.\textsuperscript{207}
\end{quote}

Industrial technology was cutting through these woods and changed the appearance of the forest drastically (fig. 4.5). This crude steam locomotive marked the beginning of large scale, sophisticated logging on the North Shore of Burrard Inlet. The forest was thinned considerably with ground yarding methods and large amounts of timber were taken down to the waterfront in a single trip; the biggest load hauled by the Walking Dudley in one trip amounted to 34,700 feet.

\textsuperscript{204} Western Lumberman, April 1910, p. 19.
\textsuperscript{205} Ibid.
\textsuperscript{206} Yarders were light engines, used to haul logs to the main skid. Roaders were heavier steam donkeys and pulled several logs along the skid to the railway.
\textsuperscript{207} Correspondence Joseph Gregson to J.S. Mathews, November 9th 1963. Vancouver City Archives.
fig. 4.4  logging operation at the mcnair-fraser lumber co.
Fig. 4.5 Walking Dudley on steep slope (Vancouver Public Library)
The Walking Dudley had few mechanical failures but in August 1910 it got out of control at the wharf and slid off the end of the pier. The machine weighed over 38 tons and was difficult to raise but it was soon back in service. In early 1911 the McNairs sold the operation to a syndicate headed by Mr. F. N. Trites, a Vancouver lumber broker.\(^{208}\) It appears that the company did not survive the depression preceding World War I and it folded up its operation some time around 1914, when most of the rails and cables were salvaged. Much of the old roadbed has since been obliterated by houses. In the forest above Millstream Road, however, remains of the wooden rail platform are still visible, held together by huge spikes. Strands of thick cable lie beside it and pieces of railway track, some as long as six meters, are scattered nearby. The introduction of the Walking Dudley was an ingenious attempt to cope with the steep terrain of the Coast Mountains, but the McNair-Fraser engine remained the only one of its kind in British Columbia. In general, the device was too slow and too expensive to meet the industry's demands for increased speed and efficiency.

\(^{208}\) No information was found on the activities of the new company owners, who had kept the original company name "McNair-Fraser Lumber Company, Limited". David Rees-Thomas, "The McNair-Fraser Lumber Company." Unpublished manuscript North Shore Archives, no date.
The American owned Capilano Timber Company had held 5000 acres of timber limits under speculation since 1908. After lumber prices began to drop in 1910, the company tried to sell its holdings to the City of Vancouver, but the Civic Water Works Committee declined the offer: the price of $650,000 was considered too high. Surveyors of the Water Branch and the Forest Branch cruised the Capilano watershed in 1914. By their estimates 4,960 acres of alienated timber - which accounted for much of the Capilano Timber Company holdings - contained 136,876,000 board feet of timber, composed of 8,267,000 feet of Douglas fir, 74,797,000 feet red cedar, 30,036,000 feet hemlock and 23,776,000 feet balsam fir. An additional 1,345 acres of unalienated Crown timber was estimated to contain 25,550,000 board feet.

The American owners decided to log the watershed in 1917, when they deemed the market situation good enough to "get some return on their heavy investment of long ago". During the summer of 1917 the company acquired additional licenses, containing 100,000,000 feet of timber. World War I created a high demand for spruce to construct aeroplanes, and the price for red cedar was rising. By the company’s surveys their limits now

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209 Timber on lots 874, 875, 1284 to 1295 and Timber License 23475 (original number 4863). Company Records Capilano Timber Company 1908, Office of the Registrar of Companies, Victoria. Note: the Capilano Timber Company was quite distinct from the Capilano Lumber Company, which cut lumber for the Capilano flume in the early 20th century.


211 The project entailed an accurate determination of the watershed, profiling and contouring of the Capilano River, contouring of reservoir sites, complete cruise of the timber and establishment of rain and stream gauges. Water Rights Branch Report 1914, Department of Lands, p. 6.

212 Water Rights Branch Report 1916, Department of Lands, p. 20.

213 Western Lumberman, April 1917, p. 33.


215 Wood was the most popular material for airplane construction at the time, because it could be worked easily and had high strength to weight ratios. R.P. Hallion, "Wooden aircraft and the Great War," Journal of Forest History, October 1987, pp. 200-202.
contained 600,000,000 feet of timber; 70% of this was cedar (red and yellow),
15% fir, and 15% spruce and hemlock; most of it was of commercial value.\textsuperscript{216}

The Capilano Timber Company planned to log the valley on a
large scale and had acquired and cruised four additional timber licences
(numbers 6905, 5737, 11929 and 11930) by 1919. These licenses were located
on steep terrain to the east of Sister's Creek and on the west side of the
Capilano, in the vicinity of Crown Creek (fig. 4.6). The surveyor's notes
indicate that the licenses contained valuable timber on rugged terrain. Timber
licenses 6905 and 11930, for example, are described as follows:

\textit{Timber license 6905: The Westerly and South Westerly part of this
limit carries a heavy growth of excellent cedar, fir and hemlock. Large timbers
run practically to the East boundary, but as the ground is very steep and
rocky it will be difficult to log that part. No part of the land is suitable for
agriculture.}

\textit{Timber licence 11930: Eastern part has earth slopes and heavy
timber, principally cedar with hemlock, fir and silver fir. Near Western boundary
ground becomes steep and rocky and timber more scrubby. Some Yellow cedar
along western boundary.}\textsuperscript{217}

This forest wealth was "bottled up aggravingly close" in the
Capilano Valley and the company faced the "staggering problem" of
transporting the timber to tidewater.\textsuperscript{218} The owners decided to invest heavily
in a railway, and to construct a mill on the North Shore. According to Mr.
Johnson, company manager, this investment was only profitable because the
timber limits were so close to Vancouver: "if the limits had been situated up
the coast and towing charges had to be added to the other expenses, the
proposition...could not have been attempted".\textsuperscript{219} The Capilano Timber
Company, now capitalized at one million Dollars, contracted for the
construction of a logging railway at a cost of $250,000, paid $20,000 for the

\textsuperscript{216} Western Lumberman, February 1919, p. 40.
\textsuperscript{217} Surveyor's field notes on timber licences 6905 (surveyed in May 1919) and 11930
(surveyed in June 1919), Department of Lands.
\textsuperscript{218} Western Lumberman, February 1919, p. 40.
\textsuperscript{219} Western Lumberman, February 1919, p. 40.
railway right-of-way and $60,000 for the millsite and booming grounds.\textsuperscript{220} The mill site at the foot of Pemberton Street consisted of 14 hectares, with 200 meters of water frontage.\textsuperscript{221}

In May 1917 company workers began to construct the railgrade; the main line followed the west bank of the Capilano river, and spur lines ran into subsidiary drainage basins. One year later 8.6 km of track had been laid; by February 1919 12.8 km of track led into the valley.\textsuperscript{222} The grading proved expensive and difficult. Ten bridges were built of local timber and the most impressive of these, Houlgate trestle, was 27 meters high and 120 meters long (figures 4.7, 4.8).\textsuperscript{223}

\textsuperscript{220} Western Lumberman, April 1917, p. 33.
\textsuperscript{221} Ibid, p. 36.
\textsuperscript{222} Report of the Department of Railways, 1918 and 1919.
\textsuperscript{223} Western Lumberman, February 1919, p. 40.
fig. 4.6
Capilano timber co. timber limits

Legend:
- Timber limit boundary

1 cm = 2 km
Fig. 4.7 Construction of Houlgate Trestle
(UBC Special Collections)
Fig. 4.8 The remains of Houlgate Trestle.
Initially the railgrade was shovelled by hand, but this backbreaking manual work was soon taken over by a Marion Steam Shovel. In the early 1920's the company began to use a Hall Machinery Diesel Yarder for clearing the right of way. This machine, operated by two men, used less than 35 cents of fuel per day. One man ran the machine and the other functioned as hookman and chokerman. It could clear 30 meters of roadbed per day in difficult terrain, in conjunction with a steam shovel. Powerful machinery pushed the logging frontier deeper into the forests of the Capilano Valley.

Logging began during August 1918 and five million feet of timber had been felled by the end of September. Trade journals praised the outstanding quality of Capilano cedar:

*It can be said that in all of British Columbia there is not such a collection of cedar trees, as are to be found in the land of the Capilano Timber Company...* The cedar will be the finest in a large quantity ever put on the Vancouver market.

Two locomotives, one Heisler and one Climax, worked an efficient network of spur lines that criss-crossed the timberstands on either side of the mainline until they were logged out, and hauled Capilano logs to tidewater. Each train consisted of 10 to 12 cars and could carry 100,000 feet of timber. In all, the company owned 39 cars, more than enough to handle the average daily cut of 100,000 feet during 1918, but fully necessary if the company’s plans to double the output were to be realized. To supply its railroad the Capilano Timber Company employed high-lead-yarding (fig. 4.9). Soon there were 175 men in the woods cutting 150,000 feet a day.

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224 Pacific Coast Lumberman, November 1922, p. 71.
225 Pacific Coast Lumberman, October 1918, p. 52.
226 Pacific Coast Lumberman, October 1918, p. 23.
227 Western Lumberman, October 1917, p. 77.
228 Pacific Coast Lumberman, October 1918, p. 23.
229 The average wage per labourer at the Capilano Timber Company was 40 cents per day. Fallers earned $5.50 to $6 per day; highriggers and hooktenders held the most dangerous positions and were paid peak wages of $7.50 to $8 per day (the same amount as civil engineers).
Fig. 4.9 High-lead-yarding operation at the Capilano Timber Company, 1918. (UBC Special Collections)
By 1923 the company operated two high lead systems and one skyline system, which lifted the logs completely off the ground. By the end of that year almost all trees had been removed from over 1,600 acres of Capilano land. The upper catchment was turned into a landscape of barren clearcuts covered with slash, which posed serious fire threats. Indeed new logging technologies had created conditions for a new, especially dangerous type of forest fire: slash fires burned at high temperatures, up to 1,814 degrees Fahrenheit, and destroyed much of the organic layer in the forest soil. Without this absorbent upper layer, runoff increased and caused severe erosion on steep mountain sides. Although all logging companies in the province were required to use spark arresters on steam engines, to burn the slash near the railway line, and to have the area of their operations patrolled by watchmen, forest fires still posed the biggest threat to lumber operations in the province.

On September 4, 1920 a fire broke out on the west slope of the Capilano Valley, above Sister's Creek, and consumed two million feet of cut logs in two days, although 200 fire fighters struggled to get it under control. This fire transformed the appearance of the already scarred forest landscape and left a "black and blasted patch", covering over 400 acres, on the mountain side. E.A. Cleveland, Comptroller of Water Rights for Vancouver, grew especially concerned about fires in the Capilano watershed. In his view the topography of the valley and surface conditions in the logged-off areas "invite[d] a conflagration". The effects would be especially serious in this catchment from which the city of Vancouver drew its water supply, because

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230 ABC Lumber Trade Directory, 1926.
231 R. White, opus cit, p. 106.
233 Western Lumberman, October 1920, p. 75.
234 Pacific Coast Lumberman, August 1921, p. 24.
"no hopeful anticipations of future luxuriant forest growth may be entertained concerning... these hillsides when once devastated by a devouring fire."\textsuperscript{235}

In the summer of 1925 another large forest fire consumed 160 acres of standing timber in the upper reaches of the Capilano Valley; the loss was estimated at $13,000.\textsuperscript{236} This fire caused much controversy over forest protection in the Capilano watershed. The 160 acres in question had been taken over by the City of Vancouver from the Capilano Timber Company shortly before the fire, but the city had made no effort to protect the timber. Ironically the burnt timber ended up in the hands of the Capilano Timber Company, which undertook salvage logging.\textsuperscript{237}

The Capilano Timber Company utilized the most advanced fire fighting equipment available at the time. It consisted of a tank with a capacity of 7,000 gallons, 72 pails, four portable pumps, 12 portable Pyrene pack cases, 3,800 feet of spare hose, 48 shovels, 48 axes and 48 mattocks. Fire fighting equipment was stored in a large box by the donkey engines for immediate use. One man was in special charge of the maintenance and the distribution of the equipment, which was painted red. Speeders were kept at strategic points during the season of fire hazard. Mr. J. J. Howard was the fire boss, in charge of a force of eleven patrolmen.\textsuperscript{238} A former employee of the company recalled that 5 cm perforated water pipes, laid every 30 meters in the vicinity of active logging operations, kept the slash damp and reduced the danger of slash fires.\textsuperscript{239}

\textsuperscript{235} E.A. Cleveland, "Report to the Honourable T.D. Patullo Minister of Lands on the question of joint control of water supply to the cities and municipalities on Burrard Inlet", October 1922, p. 88.
\textsuperscript{236} Western Lumberman, August 1925, p. 19.
\textsuperscript{237} Correspondence R. C. Rodgers to E. A. Cleveland, May 5, 1927. GVWD Correspondence files, Vancouver City Archives, Box 64-D-2, File 2.
\textsuperscript{238} British Columbia Lumberman, August 1926, pp. 22-23. It was impossible to determine from the records when this system was introduced and how frequent the patrols were.
\textsuperscript{239} Personal interview with Arthur Cormier, June 28, 1988. He worked for the Capilano Timber Company as a rigging slinger for one year (1924).
Even though the environmental damages inflicted by logging were substantial, the company took great care not to pollute the water. From the very beginnings the Capilano Timber Company used the most modern septic tanks, positioned some 400 meters away from the river, and claimed that their camps ranked among the most sanitary in the province. It was important to appease the city council and at the same time modern, sanitary camps were good advertisement for the company.

Men and camp equipment could be moved quickly and efficiently by the logging railway and the company’s camps were small enclaves of civilization in the bush. The first camp was established in 1918 and consisted of eight cars on wheels, 12 meters long and 4.2 meters wide. The cars housed 120 men who slept on steel sleeping bunks. Each car had hot and cold running water and showers and was heated by steam. The whole camp was powered by Delco equipment. Even a laundry and drying room were set up. The company constructed houses for married couples to attract a good permanent workforce. It is not certain how well this experiment worked out and how many women actually lived at the camp, but it was undoubtedly an enormous change from the isolated, primitive lumber camps of earlier years. Two dining cars seated 60 men each and the kitchen could serve them within five minutes. The cook kept 50 pigs and stored his food supplies in a root cellar. L.C. Rodgers, foreman at the company for over 10 years, recalled that the food was very good: "we had everything". A typical breakfast consisted of

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240 This was confirmed by Arthur Cormier, but he never saw a health inspector actually examine the operation for the required weekly report to the Medical Health Officer of the City of Vancouver. Ibid.
241 Pacific Coast Lumberman, October 1918, p.23.
242 The dreary camp conditions of early coastal lumbermen are described vividly in M. A. Grainger’s Woodsmen of the West (Toronto: McClelland and Stewart Limited, 1964).
243 L.C. Rodgers, Personal interview number 4, p.13. C.D. Orchard Collection, Special Collections UBC.
porridge, cereal, prunes, bacon, eggs, ham and hotcakes. For lunches and dinners the cook prepared roasts, steaks, stews, pies, cakes and cookies.

In 1922 the company constructed a "ten-year" logging camp just south of Sister's Creek. The new "camp E" was to be the central point for all operations and rail lines were run on each side of the Capilano (fig. 4.10). A water wheel was installed at Sister's Creek to generate power for the camp.  Two large buildings contained 80 beds each. Clubrooms, bathrooms, dining rooms, a modern kitchen, first aid office and machine repair shop were set up in the bush. During the 1920's three camps were usually running, employing some 250 men. The company planted grass and flowers around the main camp to give it a "homelike and attractive appearance" even though "the men scoffed at it a little before the gardener completed his work".

Many press delegations and other groups visited the camps of the Capilano Timber Company (fig. 4.11). The visitors usually rode the logging train, witnessed the topping of a spar tree by famous highriggers such as "Nick Nickson", and were given a "splendidly served camp dinner." When the members of the Empire Forest Convention visited the Capilano operation in 1923 the company even went to the trouble of preparing a two mile trail through the forest, and the "magnificence of the stands greatly impressed the guests". The visitors praised the efficient operation of the company and the quality of the timber.

244 Personal interview with A. Lucas, August 25, 1925. He worked for the company from 1925 to 1929 as a mechanic and stayed at Camp E for over a year.
245 Pacific Coast Lumberman, November 1922, p. 71.
246 British Columbia Lumberman, November 1933, p. 8.
247 Pacific Coast Lumberman, November 1922, p. 71.
248 Pacific Coast Lumberman, October 1923, p. 24.
Fig. 4.10 Capilano Timber Company Camp E during winter of 1924. T-shaped building is cookhouse. (UBC Special Collections)
Fig. 4.11  Canadian Pacific passenger agents visiting Capilano Timber Company in 1920 (Vancouver Public Library)
Fig. 4.12 Capilano Timber Company Mill at foot of Pemberton Street, 1928 (Vancouver Public Library)
Until 1925 the Capilano Timber Company sold unmanufactured logs to local mills with the slogan "we log it, you manufacture it". A large portion of their cut was also exported to the Orient and the company claimed that "Capilano quality" was the standard of excellence on the Japanese log market. Not until March 1926 was construction of the company's long-planned mill well underway. Located at the foot of Pemberton Street in North Vancouver, the establishment consisted of a remanufacturing plant, a planing mill, shingle mill, dry kiln, factory, storage sheds and an "exceptionally fine export wharf for loading deep sea vessels". The North Vancouver mill began to operate on December 1, 1926 with a daily capacity of 50,000 board feet per day. By 1927 its capacity was increased to 125,000 feet and 190 men worked at the mill. It produced high grade cedar and hemlock lumber, with some exceptionally high grade fir (fig. 4.12).

According to mill manager McMahon the operation encountered stiff competition from other lumber manufacturers, such as Hammond Cedar, Thurston Flavelle, Seattle Cedar and many manufacturers from Puget Sound. The export business, however, proved profitable. In December 1928 the company shipped 1,750,000 feet of lumber, 240,000 lath, 125,000 lineal feet of piling and 11,158,000 shingles to all parts of the world. A well known lumberman from Seattle, J. F. Drescher, was hired as "sales engineer" to expand the export trade. In January 1929 eight deep sea vessels docked at the North Shore dock, loading 4,200,000 feet of logs and lumber and 8,000,000 shingles for the Orient and Australia.

251 McMahon, Personal Interview 18, C. D. Orchard Collection, Special Collections UBC, p. 3.
252 British Columbia Lumberman, December 1928, p. 42.
253 British Columbia Lumberman, April 1929, p. 44.
When the depression hit in 1929 the mill shortened its work week to 32 hours, then closed down completely. It reopened in 1931 as a shingle mill and the company was reorganized as the Sisters Creek Logging Company which cut bolts in the Capilano Valley. The company was relatively short-lived. Its failure was in part due to the economic circumstances of the depression, but more directly to pressure from the Greater Vancouver Water District. In January 1932 it gave the company an ultimatum to withdraw its machinery from the Sister's Creek area by June 1934 and to vacate the remaining watershed by October 1936.\textsuperscript{254}

In 15 years of operation the Capilano Timber Company harvested some 400,000,000 feet of high grade virgin timber, laid 80 kilometers of railway tracks and spent $9,000,000 on wages and equipment in the Vancouver area.\textsuperscript{255} Typical of the large, integrated industrial operations that used powerful machinery to harvest British Columbia timber during these years, it also left behind a clear-cut, barren wasteland of slash and stumps (fig. 4.13). The drive for efficiency had a detrimental effect on the land. The Forest Branch had investigated logging practices in the Capilano watershed in 1923 and had advised the Capilano Timber Company that "the effect of high-lead operations on the steeper slopes should be carefully watched," and to consider confining high-lead systems "to the bottom land, benches and moderate slopes...to avoid excessive erosion which would foul the water and render the steeper hillsides permanently barren."\textsuperscript{256} The company never followed these instructions and there is ample evidence of the effects of careless logging practices on the landscape.

\textsuperscript{254} \textit{Province}, October 4, 1933, p. 4.
\textsuperscript{255} \textit{Pacific Coast Lumberman}, November 1933, pp. 8-9.
\textsuperscript{256} Report by the Forest Branch on the Capilano watershed, 1923. GVWD Correspondence files, Vancouver City Archives. Box 64-D-2, File 2.
Fig. 4.13 Slash-covered clear-cut near Sisters Creek (UBC Special Collections)
Fig. 4.14 "Nature fights back: new slide at Camp A, Nov. 14, 1919. (UBC Special Collections)
Photographs titled "nature fights back" show washouts following clearcutting. Debris flows attributable to the extensive and careless logging got dangerously close to the camps (fig. 4.14). In the fall of 1921 three bridges were washed out and the city's water intake suffered damage assessed at $25,000.257

Reporting on the Capilano in 1933, the Pacific Coast Lumberman claimed optimistically that "a splendid reproduction is following the logging that has taken place", and that so long as there were no forest fires in the area in the next few years, it would be a "bountiful asset for the next generation". A young, vigorous growth of timber would take the place of a stand of overmature trees.258 The Forest Branch did not share this optimistic view. It had carried out investigations on seven sample areas logged in November 1918, November 1919, June 1920 and May 1921 and found "almost entire absence of reproduction".259 Hemlock was the only coniferous species on the cut-over areas and it grew "only in satisfactory quantity on torn-up railway grades and cuttings where the mineral soil [was] exposed". The Forest Branch stressed the importance of artificial reforestation, and assessed the cost of planting at $18 per acre. The case of the Capilano watershed epitomized the situation of forestry in the province at the time. While many foresters called for reforestation and sustained yield management, there was no money to carry out such programmes.260

The Capilano Timber Company never reforested forest land it had cut and left more than 8,000 acres of logged or burnt timber land to the

257 Western Lumberman, November 1921, p. 30.
258 Pacific Coast Lumberman, November 1933, pp. 8-9.
259 Report by the Forest Branch on the Capilano watershed, 1923. GVWD Correspondence files, Vancouver City Archives. Box 64-D-2, File 2.
260 The government expended money on reforestation for the first time in 1930/31: a total of $14,999 for all of British Columbia. The following year it was down to $4,992. Appendix to Forest Branch Annual Report (1940), Consolidated statistical tables 1912 - 1940, p.85.
Greater Vancouver Water District. E. A. Cleveland, then Chief Commissioner of the GVWD, clearly recognized the need to replant these logged-off slopes, but he was restrained by a lack of funds and the forest was left to regenerate by itself.

In 1956, more than two decades after the Capilano Timber Company had left the valley, a study of the watershed determined that "restocking has been satisfactory on all logged or burnt lands except where fire has burned the layer of organic soil..." Between 1918 and 1933 thirty seven forest fires occurred on both sides of the Capilano River and burnt 30,000,000 feet of timber. Many of these areas were not completely regenerated by the 1950's and were dotted with burned out snags and fire killed timber. Almost 18% of the Capilano catchment basin was covered with immature timber in 1956; the principal species were hemlock, cedar and fir. This relatively healthy natural regeneration would have been impossible had a conflagration burnt out the valley. Four forest fires, all caused by lightning, broke out on the logged over limits after the Capilano Timber Company had left the valley and almost lead to disaster.

262 Correspondence E. A. Cleveland to P. Caverhill, October 7, 1932. GVWD Correspondance Files, Vancouver City Archives. Box 64-C-4, File 4.
Cedars Limited:

Cedars Limited was incorporated in 1917 by M. P. Cotton and had an initial capital of $30,000. Cotton had invested in timber holdings in the Upper Lynn area years before, but now felt that the time was right for large scale development: "for the first time the investment [gave] promise of proving profitable owing to the growing scarcity of close-in cedar and the present good prices and strong demand for lumber and shingles". The company's limits comprised about 2,000 acres in the Lynn headwaters area. In May 1917 Cotton acquired additional timber rights on District Lots 1432, 1429 and timber licenses 42715, 42716 far up on the east bank of Lynn Creek. In 1918 the company purchased a large tract of timber in the Lynn Headwaters area from the British Columbia Mills and Trading Company. A blueprint map indicates that the company owned 43,860,000 feet of cedar, 5,000,000 feet of valuable yellow cedar and 21,375,000 feet of hemlock and larch, amounting to a total of 70,235,000 feet of timber (fig. 4.15). After this expansion the capital of the company was raised to $100,000.

The company's original plan was to construct a railway into the limits. A 24" gauge railway and ten cars for $2,453 were purchased, but this scheme was abandoned after a visit to a Washington truck company persuaded Cotton to use motor trucks. Cedars Limited was pioneering the first truck operation in British Columbia and the progress of their operation was "watched with the keenest interest by many BC lumbermen whose logging costs [were] higher than they care[d] to contemplate."

265 Western Lumberman, April 1917, p. 33.
266 PABC Company Records Cedars Limited, no. BC 3253.
267 Cedars Limited blueprint map of timber holdings, January 22, 1918. North Shore Archives.
268 Western Lumberman, September 1917, p. 38.
By the end of 1917 about 6.5 kilometers of plank road had been constructed up to the forks of the Lynn; 3.6 meters wide, it had a steady grade of three percent. A portable sawmill with a capacity of 20,000 feet manufactured the planking material. Cedars Limited used four-wheel-drive Duplex trucks which could easily carry 14 tons of logs (fig. 4.16). The trucks, produced by a Michigan company, were designed for logging and road building. Some US lumbermen nicknamed the truck "road locomotive" because of its extraordinary strength; a contemporary lumber journal called them "power brutes of iron." Yet horses were not abandoned completely: they towed logs along side skids to the planked truck road.

Truck logging proved very successful for Cedars Limited and was soon taken up by the Deep Cove Lumber Company on the North Shore. The innovation spread rapidly among logging operations in British Columbia because trucks could be used on steep mountain slopes and on small patches of timber, where it would have been too expensive to run a rail line. Apart from these obvious advantages of truck logging, animal power was getting increasingly expensive. After an export boom of livestock prior to World War I the price for horses and mules had skyrocketed. A truck had a longer "working life" than animals: mules, for example, had to be at least 5 years old and could not be older than ten to do the demanding work.

269 Ibid.
270 Pacific Coast Lumberman, March 1919, p. 29.
271 Numerous horse shoes can still be spotted near the mill site.
272 Pacific Coast Lumberman, January 1919, p. 34.
Fig. 4.16 Truck Logging at Cedars Limited (North Shore Archives)
Cedars Limited constructed a saw and shingle mill on the east bank of Lynn Creek, fairly central to their timber limits (see fig. 4.1). The mill contained 4 shingle machines and an up-to-date dry kiln. A resaw and planing mill and dry kilns were added to the operation. In 1918 the company employed 50 workers, producing cedar lumber and shingle bolts at a daily capacity of 25,000 feet. The logs were moved efficiently on a high-lead system, powered by a 37" steam donkey.

A permanent logging camp with heated bunkhouses and a dining car was established at the mill site. The health authorities were extremely concerned about the "vitiation" of the water from Lynn Creek. They imposed strict sanitary regulations to protect the water supply of North Vancouver residents. Septic tanks were installed at the camp "in order to put the millsite into a thoroughly sanitary condition". 273

A community of Japanese lived on the mountainside near the mill. On the north fork of Lynn Creek, there was another Japanese camp. It was destroyed by a heavy forest fire in 1925. The fire cost one life and valuable equipment and shingle bolts were destroyed. Remains of these camps are still in the woods and pieces of Japanese ceramic can be spotted on the forest floor. It appears that there were several transient settlements in the Lynn watershed: the camp of Cedars Limited, the contractors' cabins and miners' cabins high up on the mountainside. Different companies were prospecting in the Lynn headwaters area for zinc and copper. One company, Lynn Creek Zinc Mines, Limited, even planned to use the logging road for transporting the ore. This plan was never realized because the company folded up its operation in 1918 due to the sinking value of zinc blende. Some temporary workplaces

273 *Pacific Coast Lumberman*, April 1919, p. 50.
appeared on the steep mountain slopes and vanished when it was certain that no high grade ores existed.\textsuperscript{274}

With its mill idled by heavy snow in 1919, Cedars Limited spent $25,000 on the improvement of their mill site. A new bunk house was erected near the mill, and septic tanks were installed; the sawmill was overhauled; and new machinery was added to the shingle plant to raise its capacity to 60,000 shingles per day. By 1920 the company had 40 mill workers and 50 men working in the woods.\textsuperscript{275} Together they produced 25,000 feet of cedar lumber and 150,000 shingles a day. During August of that year a forest fire burnt dangerously close to the newly renovated operation for several days, but it was put out in time.\textsuperscript{276} By 1923 the number of employees was reduced to 30 men at the mill and 40 in the woods, but the output was still the same.\textsuperscript{277} The markets of the company were largely Canadian.

Cedars Limited soon found itself in financial difficulties and appears to have wound up its operation some time before 1926; no further entries were found in the annual \textit{ABC Lumber Trade Directory}. The company dismantled most of its equipment, but the traces of their activities are still clearly visible in the forest. The watershed was closed to the public in 1928 by the City of North Vancouver and huge stumps, skids, remains of the mill and machinery lay undisturbed until 1985, when the Lynn headwaters area was opened to the public again (fig. 4.17). Within 10 years the lumbermen of Cedars Limited had transformed a virgin forest into a landscape of clear-cuts, slash, abandoned machinery and burnt timber. They employed efficient technology, driven by steam and internal combustion engines. High lead yarding left vast clear cuts and disturbed the ecosystem severely. Without seed

\textsuperscript{274} See \textit{Report of the Minister of Mines} for the years 1901, 1908, 1912, 1914, 1916, 1918.
\textsuperscript{275} \textit{ABC Lumber Trade Directory}, 1920, p. 55.
\textsuperscript{276} \textit{Pacific Coast Lumberman}, September 1920, p. 59.
\textsuperscript{277} \textit{ABC Lumber Trade Directory}, 1923, p. 45.
trees and extreme ground conditions on the forest floor (very hot or very cold) the species composition was altered. Surveyor's field notes of the upper Lynn area clearly indicate that the virgin timber was mainly cedar of large diameter, intermixed with larch and hemlock. At present the predominant species is hemlock, while some old growth forest surviving on the west bank of Lynn Creek consists largely of red cedar. The forest floor is deeply gouged from the heavy machinery and the geomorphological hazards map of Lynn Headwaters Park indicates numerous debris slides, avalanches and gullying in formerly logged off areas (fig. 4.18).\textsuperscript{278}
Fig. 4.17  Large stump with spring board marks at
Lynn Headwaters Park
Fig. 4.18  Wash-out at Lynn Headwaters Park
The Deep Cove Lumber Company:

The heavily timbered slopes of Deep Cove were taken up under speculation as early as 1906 by a Washington firm. The H. L. Jenkins Lumber Company from Blaine purchased 2,000 acres containing 130,000,000 feet of timber for $20,000. The timber limits were examined by an expert from California. He concluded that he had logged profitably "in much worse areas in the Redwood state" and put the cost of logging with donkey engines at $4,50 per 1,000 feet of timber. It is doubtful that the company ever attempted to log and the Deep Cove timber limits lay undisturbed for over 10 years. The holdings were sold to the North American Lumber Company, which in turn resold the limits to Fred Buck, director of the Deep Cove Lumber Company, in 1917. These limits, containing 150,000,000 feet of timber, covered the steep hillsides above Deep Cove and some of the area now within Mount Seymour Provincial Park (fig. 4.19).

As lumber prices rose Buck invested heavily in logging equipment to establish an efficient lumber operation. Within a year of acquiring the Deep Cove timber limits Buck spent $6,000 on logging equipment and a $5,000 Caterpillar Traction Engine. The company purchased the Walking Dudley logging engine with boiler and car, formerly owned by the McNair-Fraser Lumber Company, for $5,000 that had been stored at the Vancouver Machinery Depot Limited since 1914.

279 During the same year the McNair Shingle Company operated a shingle bolt flume from District Lot 800 down to the bay.
280 Lumberman and Contractor, May 1906, p. 19.
281 PABC Company Records Deep Cove Lumber Company B 5146 GR 1526 File 3716. The sale included the timber on District Lots 1359, 1360, 1005, 1006, 1007, 1534, 1635, 1417, 1416, 2171 and Timber License 6822.
282 Ibid.
fig. 4.19  deep cove lumber co. timber limits

Legend:
- sawmill
- timber limit boundary

1 cm = 2 km
Buck had seen how successful truck logging was for Cedars Limited and decided to try trucks as well. The Deep Cove Lumber Company began to construct its logging road in 1918. Four types of roads were in use by truck loggers at the time: the cross plank road, the fore-and-aft pole road, the fore-and-aft plank road and the cement road.283 The Deep Cove Lumber Company constructed a fore-and-aft plank road, which consisted of cross ties 2.4 to 3 meters apart, upon which the sawn timbers were laid. 150 million feet of timber could be carried on such a road before it wore out, provided it was well constructed. By 1920 the Deep Cove Lumber Company's road ran 4.8 kilometers to an elevation of 600 meters.284 The grade averaged 15%, but reached 18% in several places. This was one of the most carefully engineered and durable logging roads in British Columbia. After the roadbed had been excavated with a 65 HP Holt Caterpillar tractor, it was left to settle under heavy rains. This would define water courses and areas requiring special protection from washouts.285 The roadbed withstood this test and little repair work was needed. It was even compared to a "well executed bit of railroad track" by an enthusiastic writer of the Pacific Coast Lumberman. The company put a portable sawmill into the woods to cut planks for the roadbed; 4,000,000 feet of timber were needed to complete the road.286 The logging road was up to three meters wide and consisted of two planked wheel tracks on either side. In steep parts the planks were laid crosswise to prevent skidding.

Plans to use tractors for hauling were shelved in favour of Duplex four wheel drive trucks. In 1920 the company owned three 5-ton Duplex trucks, which dragged the timber on the plank road to tidewater. These trucks had eight speeds forward and two speeds in reverse. They could make a round

283 Western Lumberman, April 1922, p. 41.
284 Western Lumberman, October 1920, p. 39.
286 3,000,000 feet of timber for planks and 1,000,000 feet for foundation timbers. Ibid.
trip from the wharf in one hour, dragging 5 to 6 logs (3,000 to 5,000 feet of timber) at a speed of 10 km per hour.\textsuperscript{287} Truck logging was carried out all year round and during snow and frost the rims of the wheels were simply covered with heavy wires. At the wharf the logs were rolled into the water and boomed. Some 40,000 feet of lumber per day arrived at the booming grounds, but Buck had plans to expand the cutting capacity to 75,000 feet.\textsuperscript{288}

The Deep Cove Lumber Company did not have its own mill, but sold fir, cedar and hemlock logs to mills in the Lower Mainland and to the prairies. Two large sawmills, the Vancouver Cedars Mills, Limited, and the Dollarton Sawmill were located in close proximity to Buck’s logging operation (see fig. 4.19). Neither operation logged on the North Shore, but held timber limits elsewhere and the logs were brought in by barge.\textsuperscript{289} Even though no confirmation of log sales to these two mills was found, it would seem very likely that the Deep Cove Lumber Company supplied them with logs.

The Deep Cove Lumber Company logged efficiently with a high lead system and an average 12,000,000 feet of timber were within the reach of one spar tree. Three donkey engines operated the high lead system. A logging camp was set up "in the timber" and housed 45 men. It consisted of comfortable bunk houses, a dining room, store houses, a blacksmith shop and a truck shelter.

On July 22, 1922 a forest fire almost destroyed the limits. The logging camp and the donkey engines were saved, but one million feet of felled timber were burnt.\textsuperscript{290} The fire was probably started by sparks flying from a donkey engine, and the slash on the ground was easily ignited. The fire did not

\textsuperscript{287} *Western Lumberman*, October 1920, p. 39.
\textsuperscript{288} Buck owned another logging operation at Cedar Creek near Wood Fibre, where he used trucks as well and employed 45 to 60 men.
\textsuperscript{289} The Dollarton company had limits in Coquitlam, Deep Bay and Union Bay (Vancouver Island) and Port Moody.
\textsuperscript{290} *Province*, July 22, 1922.
ruin the company financially and by 1923 it had added another Duplex truck and donkey engine to its stock. Some 40 to 45 men were employed, cutting 45,000 feet of timber per day.\textsuperscript{291} In 1925 another fire destroyed the camp, but it is not known how much timber was burnt.\textsuperscript{292} Two forest fires and efficient logging methods forced the company to close in 1926 because it had exhausted its timber supply. A meeting of the creditors was held and the company wound up its assets voluntarily.

The logging road of the Deep Cove Lumber Company was so well built that it is still a prominent trail in the dense forest. Until a few years ago most bridges on the "Old Buck Trail" were still intact. Some 60 years after the road was constructed time is taking its toll and the bridges are collapsing. Many planks are still in place and are smooth and polished from all the traffic they carried. Two tractor wheels can be spotted at the side of the road, reminders of the innovative spirit of Fred Buck.

Within the first three decades of this century four radically different sources of power were employed in lumber and shingle operations on the North Shore of Burrard Inlet: animal power, steam power, internal combustion engines and electricity (at the mill site). It is difficult to divide logging on the North Shore of Burrard Inlet into distinct phases, because industrial technology penetrated the last frontier of forest resources in North America rapidly and at a late stage of development. Different forms of power coexisted, but the general trend of lumber and shingle operations in this area was to move further away from the water's edge into steeper terrain (figures 4.20, 4.21, 4.22, 4.23 and 4.24). The greatest variety of transport methods existed in 1920: West Vancouver shingle operations transported bolts and lumber by flume; the Capilano Timber Company operated a logging railway;

\textsuperscript{291} ABC Lumber Trade Directory, 1923.
\textsuperscript{292} Ibid, 1926.
the Lynn Valley Lumber Company hauled logs and bolts with horses and steam donkeys; Cedars Limited and the Deep Cove Lumber Company employed logging trucks (fig. 4.22).

In a study of the lumber industry in Northern New York Dinsdale has argued that each technological phase displays characteristic spatial patterns and changing attitudes towards the environment. But she dealt with a period of relatively gradual technological change and such a classification is not applicable for the North Shore of Burrard Inlet. The technological mix of flumes, hauling with horses, logging railways and motor trucks is characteristic of other logging areas in British Columbia at that time. The spatial pattern of saw and shingle mills close to the resource did not change over the first decades of this century, because transportation remained a problem. A centralization of operations and economies of scale, typical of the neotechnic phase, eventually evolved along the coast. Such consolidation was never completed on the North Shore of Burrard Inlet, because all logging ceased before this new phase in the lumber industry.

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fig. 4.21  north shore logging 1910

Legend:

- - - - - - railway
- - - flume
- - - - skid

- saw and shingle mill
- - shingle mill

1 cm = 2 km
fig. 4.22  north shore logging 1920

Legend:
-  flume
-  skid
-  railway
-  truck road
-  saw and shingle mill
-  saw mill
fig. 4.24 expansion of logging operations into steeper terrain
Chapter 5: Resource Use Conflict in the North Shore Watersheds.

The City of Vancouver tapped the upper reaches of North Shore rivers for its water supply long before logging moved into the upper levels of this area. But this spatial demarcation of activity and interest was challenged as loggers moved into the watersheds and employed increasingly powerful technologies. The resulting conflict over rights to use timber and water resources was, briefly, heated and received much local publicity. There were three distinct stages to this debate. The initial controversy joined in the early 1900’s, and relatively muted, centered around the Capilano watershed and soon included the Seymour watershed. With rapid population growth other intakes were constructed on several North Shore streams just as new technologies allowed lumbermen to push further upslope and to remove greater proportions of forest. Water managers began to recognize the ecological impact of logging on run-off and slope stability. In the 1920’s increasingly large scale logging development, improved knowledge of watershed ecology, ideas of multiple use and continued population growth lead to a widely publicized controversy. It ended in 1926 when the Greater Vancouver Water District took control of the Capilano and Seymour watersheds and logging companies were bought out or expropriated. The City of North Vancouver had control over the Lynn watershed. By the mid 1930’s the North Shore watersheds were closed to loggers and public alike, and so they remained for the most part, for almost half a century.
The early watershed controversy:

The Vancouver Water Works Company was formed in 1886; by 1889 a 16 kilometer pipe system supplied the city of Vancouver with Capilano water. The river was tapped at a rock filled wooden crib dam at an elevation of 125 meters, 10.4 kilometers upstream from its mouth. The city purchased the system in 1891 for over $450,000 and expanded the distribution network. By 1906 more pressure was needed and the intake was moved almost 1.5 km upstream, to an elevation of 265 meters (fig. 5.1).

During the late 1890's the City Engineer had advised the Vancouver City Council to buy all the land in the Capilano Valley to assure the city's future water supply. The city did not see any need for these precautions and merely purchased 160 acres of Capilano land near the intake. Lumbermen, however, were quick to acquire extensive timber limits in the watershed and constructed a shingle bolt flume along the Capilano River. J. C. Keith associated with the Capilano Parks Company, owned the most extensive limits, over 5,000 acres above the waterworks dam. In 1902 he proposed to sell the property to the City of Vancouver for $15,000, provided he would be permitted to take off the timber over the next five years. Several aldermen opposed this proposal and urged the city to acquire both land and timber because removal of forest cover above the dam might cause a "wholesale barrenness and interfere with the steady water supply." The Province raised the question whether Capilano water would be "infected" by lumbermen who might dispose of camp refuse into the stream.

296 Ibid.
297 Province, June 9, 1902, p. 1.
fig. 5.1 capilano, lynn and seymour watersheds

Legend:
- watershed boundary 1920's
- intake

1 cm = 2 km
The city council, however, was split on the issue of buying Keith's timberland and the matter was left pending for three years.

In 1905 Mayor Buscombe argued that the acquisition of timber above the waterworks dam was "a subject of vital importance" and advocated that the city should have control over "every foot of land and every stick of timber" in the upper portion of the Capilano Valley. He urged the provincial government to arrange a 999 year lease of the Capilano watershed. The government refused this request because it saw greater potential revenue in timber royalties and because its most important goal at a time of wide economic fluctuations was to get the lumber industry on its feet. Economic uncertainty led to short-term planning, "converting as much as possible of the accumulated wealth of centuries into cash without delay".

Professor Stewart, Superintendent of Forestry for the Dominion of Canada, examined the Capilano watershed and concluded that there was no need for the city to put a halt to logging activities. In his view, it was not necessary to have a dense forest on the watershed, as long as small trees and shrubbery covered the ground to retain moisture. The greatest danger to the water supply was fire; once the watershed was denuded of trees the river would be a raging torrent in winter and dried up in the summer. Provided that great care was taken to avoid fires Stewart was in favour of logging. Many Vancouver aldermen seemed convinced by the "expert's view of preservation" and saw no need to purchase alienated Crown land in the Capilano catchment area.

298 Province, November 11, 1905, p. 1.
299 H. N. Whitford and R. D. Craig, Forest Resources of British Columbia (Ottowa: Commission of Conservation, 1918).
300 Province, October 7, 1905, p. 1.
301 Ibid.
At the same time Vancouver's Mayor Buscombe urged the council to secure the Seymour River as a second source of domestic water because the city was growing at a rapid rate and there was "nothing like making provisions for the future". The Superintendent of Waterworks and a group of engineers surveyed the Seymour River during the fall of 1905 to determine a suitable intake location and to stake water records of 1,000 miner's inches. They considered the Seymour River an excellent source of water and suggested that it might also be used for generating power. Shortly after the report on the Seymour survey was published the municipalities of North Vancouver, Richmond, South Vancouver and Burnaby competed for water rights on the Seymour. The ensuing struggle over water rights was not settled until April 1906, when the City of Vancouver was given rights to 1,400 miner's inches per day, North Vancouver 800 inches, South Vancouver 300 inches, Burnaby 250 inches and Richmond 250 inches.

While these municipalities were preoccupied with the apportionment of water rights, timber claims were taken up above the proposed intake and along both sides of the Seymour River. Timber speculation was rampant during 1906 and once again the municipalities concerned had failed to secure rights to timberland on an important watershed. The Province raised the question whether the city was repeating the "Capilano neglect". Finally, in September 1906, the Provincial Government placed a reserve on the remaining unalienated Crown timber in the watershed, but much land was

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302 Province, November 13, 1905, p. 3.
303 In order to make a legal application to the Provincial Water Commissioner the point of the intake had to be marked by stake, as well as the route over which the water was to be conveyed in pipes or flumes.
304 Province, April 28, 1906, p. 9. A miner's inch is the amount of water flowing through a one inch square hole cut horizontally through a two inch plank in a 24-hour period when the water is kept at a six inch height above the top of the hole.
already taken up by speculators. The Seymour intake was completed during the fall of 1908, 11 kilometers from the mouth of the stream at an elevation of 140 meters above sea level. Five years later a new intake was built, 600 meters above the old one (see fig. 5.1).

Lynn Creek supplied the City of North Vancouver with water and the first intake was constructed in 1905. By 1911 there were plans to build a dam at Lynn Lake to secure a water reserve at the headwaters of Lynn Creek, but they were never realized although a second intake was constructed on lot 999. Additional intakes were built at smaller streams such as Mosquito Creek, Brothers Creek and Cypress Creek. Vancouver's water was considered the "purest in the world", and the water system was "the pride of the Pacific Coast", but an increasing number of people feared that the future supply was threatened by logging.

306 B.C. Gazette, September 6, 1906. All vacant Crown land in the Seymour watershed was to be "reserved from pre-emption, sale or other disposition."
Acquisition of scientific knowledge on North Shore catchment areas:

Initially natural resources in British Columbia appeared unlimited and early provincial policy was designed to promote a resource based economy. With population growth and expanding exploitation, conflicts were inevitable and the government was poorly equipped to deal with them. The struggle between lumbermen and municipal authorities over North Shore watersheds was an early, widely publicized instance of resource use conflict in this province. From its very beginnings forest management in British Columbia was handicapped by a lack of reliable surveys and statistics. The government often ignored the uncertainty about extent and value of the forest resource and assumed unlimited supply, giving away timber rights freely. Short term goals had to be met to secure the much needed income from the different forms of alienated Crown Lands. F. J. Fulton, chairman of the first Royal Commission on Timber and Forestry 1909/10, clearly recognized the relationship between surveys (or lack thereof) and forest policy:

It is evident that a lack of reliable statistics has a serious bearing on forestry problems. Inflated estimates of the present supply of timber cause people to be careless of the waste of it; distorted theories of annual destruction, by fire and by lumbering, enable alarmists to harm the common-sense campaign for conservation by their exaggerations...

Even though the Commissioners' Report and the Forest Act of 1912 strongly emphasized the necessity of a sound knowledge of the forest resource, survey work in British Columbia was slow and piecemeal.

The Water Branch and the Forest Branch of the Department of Lands surveyed the watersheds of the Lynn, Seymour and Capilano Rivers in 1913/14. The work consisted of profiling and contouring of streams, contouring

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of reservoir sites, a complete cruise of alienated and unalienated timber and the establishment of rain gauges, permanent weirs and stream gauges. The Lynn survey was not completed, but reliable facts about extent, forest cover and ecosystem functioning of the Seymour and Capilano watersheds finally became available and raised awareness among foresters and water managers.

Concerned about slope stability, the survey reports stressed the importance of retaining the timber on the watersheds; this was especially crucial for the Capilano area:

_IN many places there are signs of freshet streams where the sub-surface is seen to be nothing but a mass of boulders. At the sides of these courses can be seen the shallow depth of the surface soil, bound, as it were, into a mat by the roots of the timber, which, if allowed to be cleared off, would cause the formation in many places to wash down, leaving nothing but the sub-surface boulders. The timber fulfils the purpose of regulating the run-off, a factor to be considered by the municipalities which hold water rights on the creek._

Conditions at the Seymour watershed were similar: where the timber had been removed the soil was "quickly washed off, leaving bare mountain sides off which the precipitation rushed almost as it [fell], causing sudden dangerous floods laden with great quantities of sand, gravel, and organic matter, rendering the water unsatisfactory for domestic purposes".

The City of Vancouver began to realize that uncontrolled logging and domestic water supply were incompatible resource uses and attempted to acquire over 4,000 acres of alienated timberland in the headwaters of the Seymour watershed. There was a particular urgency to purchase this land because D. A. Robinson from Seattle, speculative owner of this land for several years, had voiced plans to construct a standard gauge railway to develop its limits. Two independent parties of cruisers were at work during the summer of 1913 to determine a compensation price for the owners. The surveyors of

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313 Western Lumberman, August 1912, p. 7.
the Forest Branch estimated that the area in question contained 124,000,000 feet of timber; only 98,340,000 feet were considered merchantable and were valued at $56,919 after allowing for logging costs. Eustace Smith, cruiser for the waterworks committee, cruised the same area and concluded that it contained 110,222,000 feet of merchantable timber, valued at $319,500. The two cruises produced vastly different results and no agreement was reached on the value of the alienated timber. The forest was left in the hands of timber speculators.

Large scale logging development in North Shore Watersheds:

The debate over logging and water rights was reinvigorated in 1917, when several companies announced plans to develop their North Shore limits to take advantage of rising lumber prices. The Capilano Timber Company intended to construct a logging railway into the Capilano catchment area. The Robinson Company dusted off its similar plans for the Seymour watershed. Cedars Limited was constructing a truck road into the upper reaches of the Lynn Creek Valley and the Vedder River Shingle Company was cutting shingle bolts near Cypress Creek and Brother's Creek, the sources of domestic water for West Vancouver. Members of the city councils of Vancouver and North Vancouver went to Victoria "to register protests with the government concerning the plans of owners of timber" in North Shore catchment areas. They expressed "grave fears" about contamination and disruption of their water supply. The solicitor of the Capilano Timber Company

315 "Report and estimate on approximately 4,100 acres of timber land situated in the Valley of the Seymour Creek and contained in the following lots: 864, 956, 1441, 1444 to 1447, 1450, 1451, 1597, 1598, 2625 and TL's 8072, 8073, 8074." Summer 1913. PABC 943, Box 30, file 20.
316 Its twice proposed railway was never constructed.
317 Western Lumberman, April 1917, p. 33.
was present and stated that the company had every right to log its limits, but conceded that he was willing to discuss methods to prevent water pollution with the members of the city councils.

The government committee agreed to discuss the matter, but did nothing to stop logging development in North Shore catchment basins. The government felt that it was up to the municipalities to sort out this conflict. Its attitude is best illustrated by correspondence between the City Clerk of North Vancouver, the Forest Branch and Cedars Limited. The city clerk of North Vancouver contacted the Water Rights Branch of the Department of Lands and pleaded that a reserve be placed on the watershed timber in the Lynn headwaters area, because logging would pollute the water and reduce the river’s flow. The city clerk proposed that the company might be compensated by an equivalent amount of timber "in some other locality". The Water Rights Branch simply relegated the matter to the Forest Branch. The North Vancouver city council demanded that the Forest Branch cruise the alienated watershed land to establish a compensation price for Cedars Limited. The Forest Branch estimated that a cruise would take eight weeks and would cost about $1,600. Understaffed and underfinanced, the wartime branch simply could not carry out this cruise. Writing to the Minister of Lands the Chief Forester explained:

"Under the circumstances I would suggest that as this is a matter concerning chiefly the City of North Vancouver and private interests that the cruising and exchange of timber might be done at their own expense. Regarding the suggestion that the government should purchase the timber on this area to protect the water supply of North Vancouver, it would seem to me that the city is responsible and not the government."

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318 Correspondence city clerk of North Vancouver to Comptroller of Water Rights, May 26, 1916. PABC Forest Branch no. 943, box 31, file 2.
319 Ibid.
320 Correspondence Chief Forester to Minister of Lands, February 12, 1917. PABC Forest Branch no. 943, box 31, file 2.
Cedars Limited was concerned to see the cruise under way because their business was tied up. The company had purchased a considerable amount of mill machinery and was eager to start construction; owner M. P. Cotton proposed selective logging. All spruce, hemlock, fir and larch would be left standing and only the cedar would be taken. This, he explained to the Minister of Lands, would "leave a very large amount of standing timber throughout this area and... would be a fair way of settling this question of conservation of water both to the city and ourselves." He added that the company had the unanimous support of North Vancouver, because the enterprise would provide local employment and planned to operate for at least 15 years. Yet the Forest Branch doubted that selective logging was viable because logging with donkey engines would destroy the remaining timber.

By the early 1920's the Capilano Timber Company and Cedars Limited were clear-felling the slopes of the Capilano and Lynn Valleys. The Forest Branch and E. A. Cleveland, British Columbia's Comptroller of Water Rights, grew increasingly concerned, in particular over the Capilano watershed. The Forest Branch studied the effects of logging on the Capilano catchment area and concluded that clear-cutting had a negative impact on slope stability and natural regeneration (see chapter 4). E. A. Cleveland investigated the situation and concluded that logging and watershed activities could not be carried out side by side:

Considered as economic resources, [emphasis added] it is not open to debate that the value of these watershed areas lies first in their importance as sources of pure water supply and secondly as stands of merchantable timber.

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321 Correspondence T. W. Cotton to Minister of Lands, January 6, 1917. PABC Forest Branch no. 943, box 31, file 2.
322 Correspondence Assistant Forester to Chief Forester, January 15, 1917. PABC Forest Branch no. 943, box 31, file 2.
323 E. A. Cleveland, "Report to the Honourable T.D. Pattullo Minister of Lands on the question of joint control of water supply to the cities and municipalities on Burrard Inlet", Victoria 1922, p. 85.
While Cleveland was strongly in favour of a policy of closing off the watersheds, the Minister of Lands was of the opinion that "logging would not have the slightest effect" and predicted that within five years sufficient new growth would have regenerated to protect the catchment areas.\footnote{324} Pattullo agreed with Cleveland that it was crucial to establish a board to administer the water supply "for the joint benefit of all municipalities concerned".\footnote{325}

H. R. Christie, professor in the Department of Forestry at U.B.C., suggested a concept of multiple resource use. He considered the demise of logging in the watersheds of the North Shore a serious financial loss for the local economy. He thought that "the policy should be to use all the timber rather than to lock it up for fear of possible damage to the watershed."\footnote{326} Easily accessible, productive coastal forest areas were becoming scarce, therefore logging should be allowed to continue, but "under a system that will expose only a small portion of the watersheds each year and which will establish reproduction of young growth on the logged-off areas".\footnote{327} He advocated a policy of sustained yield, which meant harvesting of timber at a constant rate which could continually be supported by the forest land.

The city was to purchase the logged-off areas at a low price and utilize the land to grow successive crops of timber, a practice common in many European countries. This concept of a fully regulated forest was an ideal of European foresters. It has a balanced age-class distribution containing no areas with timber older than rotation age. All revenue was to be collected in a special fund for reforestation and scientific forest management. Christie visualized the watershed forests as ideal research areas for U.B.C.'s young

\footnote{324}{Province, February 22, 1924, p. 20.}
\footnote{325}{Province, March 6, 1924, p. 21.}
\footnote{326}{Correspondence H.R. Christie to Chief Forester, March 20, 1922. PABC Forest Branch 943, Box 30, file 20.}
\footnote{327}{British Columbia Lumberman, February 1925, p. 49.}
department of forestry. Major Andrews from the Forestry Branch had similar ideas and proposed to use the mature and over mature timber before it would deteriorate. He suggested the establishment of a nursery on the North Shore.

Christie drew his ideas of **efficient** resource use from the American Progressive Conservation movement, which was at its peak in the early 20th century. He might have been familiar with the work of W.J. McGee, an important theorist of the conservation movement, who wanted integrated, multiple purpose development of water resources in the United States. McGee's plans, however, were never realized: Roosevelt created an Inland Waterways Commission in 1907, but the project was abandoned when he failed to get support from congress.

The Forest Branch of British Columbia, founded in 1912, was built upon these conservation ideas and was essentially "a product of the North American conservation movement in its mature phase of development." W.R. Ross, Minister of Lands, stressed that forest conservation did not mean forest reservation, "a queer misapprehension" that had often "hampered the progress of the conservation movement in other portions of this continent."

The Provincial Forest Branch was established relatively late, thus it could avoid mistakes made elsewhere and integrate successful scientific and administrative principles from other countries. It was in charge of practical matters such as Crown timber rights, surveys, fire prevention, reforestation.

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and enforcement of regulations. The Minister of Lands predicted that "the epoch of reckless devastation of the natural resources" was over.\footnote{Hon. W. R. Ross, "British Columbia's Forest Policy," Speech to the Legislative assembly of B.C. on the 2nd Reading of the Forest Bill, Victoria 1912, p. 24.}

Some progress was made over the years to come, but mining of the forest resource and destructive logging practices continued. From its inception the Forest Branch was hampered by a lack of funds. This was an enormous handicap to scientific forest management and Sloan complained as late as 1945 that underfunding was "a sombre thread" which ran through all aspects of forest administration in the province.\footnote{Hon. G. Sloan, Report of the Commissioner relating to the Forest Resources of British Columbia (Victoria: King's Printer, 1945).}

One might have expected good forest management in Vancouver's watershed areas to show off the Forest Branch's capabilities. This was not the case, and the provincial government put the responsibility of the watersheds into the hands of municipal authorities. Stephen Gray characterized the situation of forestry in the early decades of this century:

\begin{quote}
The general problem in forest administration after the formation of the Forest Branch was that the expertise and technical knowledge of its foresters tended to run far ahead of the willingness or ability of the government to apply their knowledge to the actual day to day administration of the forest.\footnote{S. Gray, "Forest Policy and Administration in British Columbia 1912-1928," MA Thesis Simon Fraser University, 1982.}
\end{quote}

Increasingly the public began to voice its opposition to logging activities in North Shore watersheds. The Vancouver Natural History Society, for example, strongly opposed logging activities in the Capilano watershed. One of its members, Professor John Davidson, gave a fierce speech on the issue.\footnote{J. Davidson, "The handwriting on the wall or wake up! Vancouver," Presidential address to the Vancouver Natural History Society, October 1, 1924. Vancouver City Archives.}

He drew biblical comparisons and reminded the audience of the devastating effects of deforestation in the Mediterranean, likely an idea drawn from George Perkins Marsh's \textit{Man and Nature}. Vancouver was a prospering...
city and its greatest asset was its pure water supply, held by "greedy, grasping, thiefish lumbermen." He demanded that all logging cease at once and steps be taken to reforest the area as soon as possible. One Vancouver citizen expressed anger that the Capilano Timber Company was allowed "to jeopardize the health, the welfare, yes, the very lives of a quarter million people" and warned the company to keep its "hands off our watershed!" The Province reported on a looming "watershed war".

Armageddon was averted by the incorporation of the Greater Vancouver Water District in December 1924. The objectives of the new organization were stated as "the acquiring, supplying, and distribution of water from any source or sources for the use of the inhabitants for all purposes." The GVWD was "empowered to purchase, construct and operate water works systems" and "to acquire lands and timber within or without the District to be used for its water works or for protecting and preserving its sources of supply".

During the first meeting of the Water Board in February 1926 E. A. Cleveland was elected Chief Commissioner. He immediately initiated negotiations with lumber companies to vacate the North Shore watersheds. Cedars Limited found itself in financial difficulties by 1926 and folded up its operation in the Lynn Headwaters area by 1928. The Capilano Timber Company continued to log, but signed an agreement with the Water Board to withdraw its logging operations within four years. By 1933 the company had removed most of its machinery from the Capilano Valley and the Vancouver Province reported that "the last log on the Capilano was taken out two weeks

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337 Province, September 12, 1924, p. 13.
338 Vancouver Sun, September 6, 1924, p. 1.
ago, and by next March there will not be a living soul on the site of the present watershed". Various independent lumbermen who carried out small scale logging were gradually bought out or compensated and by 1936 the watersheds of the Capilano, Lynn and Seymour Rivers were completely sealed off.

Construction of the Cleveland and the Seymour Dams during the 1950's have been the only large scale developments in the Capilano and Seymour watersheds since they were sealed off. In 1961 the GVRD Forestry Department began to manage the Capilano, Seymour and Coquitlam watersheds. Some 100,000 cubic meters of wood are currently harvested from these watersheds each year. The GVRD is licensed to cut six to eight 15-ha blocks annually. The logged-off areas are reforested immediately, and then tended according to careful practices including weeding and thinning. 95% of the harvested trees are older than 250 years, an age when most trees begin to deteriorate and become prone to insect infestations. This forest management is of vital importance for maintaining water quality. The harvest revenue amounts to about $200,000 per year and is mainly used to finance silvicultural practices, road construction and maintenance. In the Seymour watershed alone some 40 kilometers of road have been developed thus far.

In the summer of 1987 the lower Seymour Valley was opened to the public, because it was certain that it would not be required for water supply until the next century. The forests of the lower Seymour Valley are now a managed, shared resource for forestry, watershed, recreation and

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341 *Vancouver Province*, December 4, 1933, p. 4.
342 The tedious process of buying out various owners is well documented in the GVWD Correspondence files, Vancouver City Archives.
343 The Cleveland Dam was completed in 1954 and holds 46,000 acre feet; the Seymour Falls Dam, finished in 1961, has a storage capacity of 20,500 acre feet.
education. Here the essential idea of multiple use advanced by H. R. Christie in the 1920's has finally been realized.

The Lynn watershed was abandoned as a source for domestic water, after much of the water intake system was destroyed by severe flooding in 1981. Lynn Headwaters Park was opened to the public in 1985. The Seymour Demonstration Forest and the Lynn Headwaters Park clearly exemplify the shift in forest values our society has experienced over the past decades. Fifty years ago society valued forests primarily for their timber. With increasing urbanization this evaluation has shifted to place more emphasis upon non-economic values. The forest has become an escape from noise and stress in the city. Paradoxically huge stumps with spring board marks and moss covered skids that are now the most obvious remains of an era of unmanaged resource extraction, add a particular charm to the North Shore forests today (figures 5.2 and 5.3). They convey a certain spirit of place and a sense of history, although both place and past are often but thinly understood by those who encounter them.

Fig. 5.3  Moss-covered skid road
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Frequently used abbreviations:

PABC... Provincial Archives of British Columbia
VCA..... Vancouver City Archives

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Note on the maps produced for this thesis:

Information on location of logging operations was compiled as accurately as possible from the maps listed above, as well as surveyor's notes, company records and field work.
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