



Alberta Community Development

## 2. History of Industrial Development: 1900–2000

### Northern Alberta in 1900

Although the settlement and transformation of southern Alberta was well underway by the late 1800s, northern Alberta at the turn of the 20<sup>th</sup> century remained in an essentially pristine state. The small human population that existed in the north at this time was still mostly native, and life continued to revolve around trapping, fishing, and hunting, as it had for more than a century (Wetherell and Kmet, 2000: 107). Major river corridors still served as the primary transportation routes, augmented by a trail system that was maintained by the Hudson's Bay Company (Stelfox and Wynes, 1999: 6-54).

Although the fur trade of the 19<sup>th</sup> century was not associated with significant structural changes to the boreal forest, increased rates of mortality from trapping and hunting with firearms did directly affect several species. In most cases, populations were able to recover once the rate of trapping declined after the 1930s (through regulation and reduced demand for wild fur). However, the hunting of wood bison to sup-

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ply brigades and trading posts almost led to their extinction before conservation measures were enacted.

Wood bison are large animals that tend to herd together in open meadows, making them highly vulnerable to mass slaughter. By 1891 there were only a few hundred animals remaining, centred in the region that is now Wood Buffalo National Park (Carbyn et al., 1993: 18). The Dominion Government passed a law in 1893 to protect the remaining animals and in 1922 Wood Buffalo National Park was established to ensure their permanent viability (Gates et al., 1992: 145). Bison numbers did recover substantially; however, through management error in the late 1920s the wood bison were hybridized with plains bison and infected with tuberculosis and brucellosis (Gates et al., 1992: 146). Because of these problems the long-term future of wood bison in Alberta remains uncertain.

## **Settlement patterns**

Several unique features of northern Alberta marked it for early development, relative to the northern regions of other provinces. These included the existence of large tracts of arable land along the Peace River (including several large open prairies), widespread deposits of oil, and the existence of a well established northern supply centre (Edmonton). Although these features were well known prior to 1900, several developments had to occur before large-scale settlement could proceed:

1. First Nations Treaty. Until Treaty 8 was signed with the First Nations chiefs in 1899, there existed no legal basis for the private ownership of land in the north.

2. Development of administrative and legal infrastructure. Prior to the onset of homesteading, the land had to be surveyed, First Nations reserves had to be designated, homesteading policies had to be defined, and local police detachments had to be established to enforce social order.
3. Development of Marquis wheat. Marquis wheat was a high-quality early-maturing variety of wheat introduced in 1910 that resolved concerns about northern Alberta's short growing season (Wetherell and Kmet, 2000: 130).
4. Settlement of the south. Demand for homesteads in the north became significant only after good-quality land in the south became scarce, after 1900 (Wetherell and Kmet, 2000: 129).
5. Establishment of railway links. A market economy for agricultural and other products could not be established until rail links were available for transporting goods to population centres in the south.

Progress on all fronts was rapid and by 1909 the first land office was opened and homesteaders began entering the north in large numbers (Stelfox and Wynnes, 1999: 6-20). Most of the settlers were drawn by the prospect of farming; therefore, settlement was focussed almost exclusively on the arable land in the Peace River region. By 1931, the population of the south Peace River region had grown to almost 51,000 (Wetherell and Kmet, 2000: 243).

In 1939 the province moved to a system in which land capacity became the basis for land grants, in place of the haphazard homesteading system (Wetherell and Kmet, 2000: 255). A formal land classification scheme was implemented

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in 1948 that restricted agricultural settlement in the north to a defined area along the Peace River now known as the White Zone (Fig. 2.1). The remaining area, called the Green Zone, was deemed best-suited to non-agricultural use (though grazing reserves were still permitted). These land designations were not set in law and, therefore, remain subject to change at any time at the discretion of the Minister (Moen, 1990: 14).

After the Depression the population of the Peace River region grew steadily, at a rate similar to that of the province as a whole (Fig. 2.2). Farming continued to be a major driver of this growth; however, increasing need for support services

(e.g., education, medical care, administration) also resulted in the growth of local urban communities (Fig. 2.2). In the latter half of the century the expanding petroleum and forest industries became the main drivers of continued growth in the region (Stelfox and Wynes, 1999: 6-21).

In contrast to the rapid settlement of the Peace River region, settlement of northeast Alberta was very limited in the first half of the century — so much so that northeast and northwest Alberta began to function as two separate units. The west was farm country, which was economically and socially an extension of prairie settle-

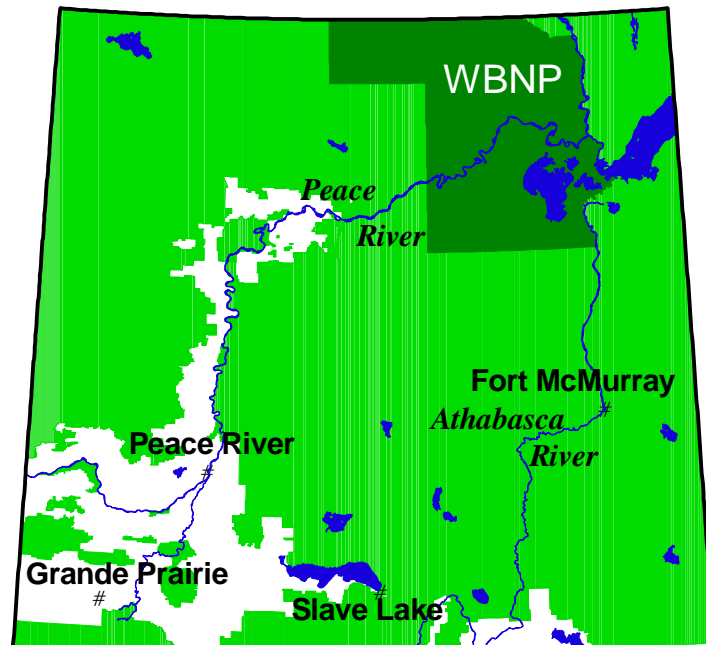


Fig. 2.1. Northern Alberta, showing the current boundaries of the Green and White Zones, and Wood Buffalo National Park (WBNP). (Map: Forest Watch Alberta)

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ments to the south. The east was still primarily dependent on trapping, and continued to serve as a transportation corridor to the far north.

Rapid population growth did occur in the northeast after 1960, primarily because of the expansion of the petroleum industry (Fig. 2.3). Almost all of the growth occurred in Fort McMurray and surrounding area, which served as the primary support centre for the oil sands mines and other petroleum activities in the region.

As of 2000, the official population count in the northwest was 118,103, and 64,735 in the northeast (4.1 and 2.2 percent, respectively, of the total provincial population) (AMA, 2001). Most urban communities are in the northwest, including 13 towns with more than 1000 people (Figs. 2.4, 2.5a) (AMA, 2001). In the northeast only Fort McMurray and Slave Lake significantly ex-

ceed 1000 people, and they account for 83% of the permanent residents of the region (Fig. 2.5b). Fort Chipewyan, the third largest town in the northeast, has a population of approximately 1000.

## Access Development

The transportation infrastructure that was initially developed in the north was closely linked to the needs of the agricultural community in the Peace River region. A railway link to from Edmonton to Grande Prairie was established in 1916. This was followed by regional rail links and the development of a local road network. By 1924, 140 km of roads were in place in the Peace River region (Wetherell and Kmet, 2000: 192). A road from Grande Prairie to Edmonton was completed in 1932, though it was not fully grav-

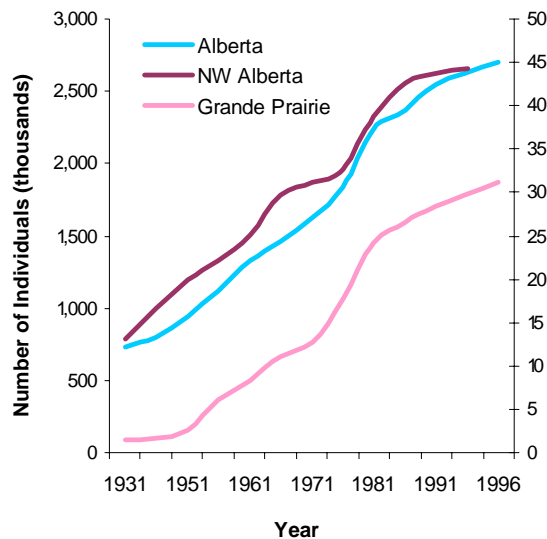


Fig. 2.2 Population of Alberta (left axis), northwest Alberta (north of 56 degrees; right axis), and Grande Prairie (right axis): 1931-1996. Sources: Stelfox and Wynes, 1999; GPCCD, 2001

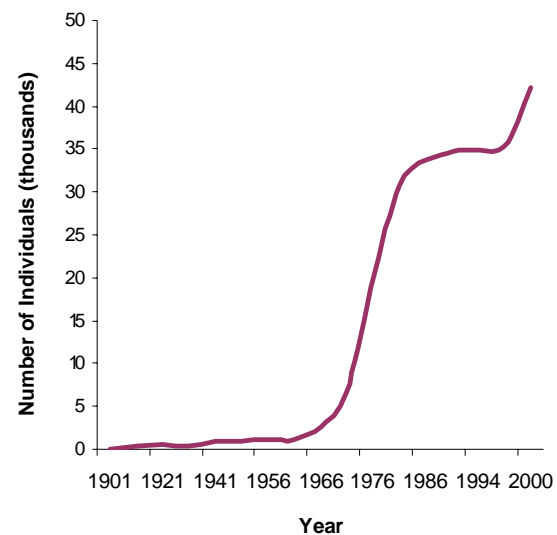


Fig. 2.3. Population of Fort McMurray: 1901-2000. Source: FMHS, 2001.

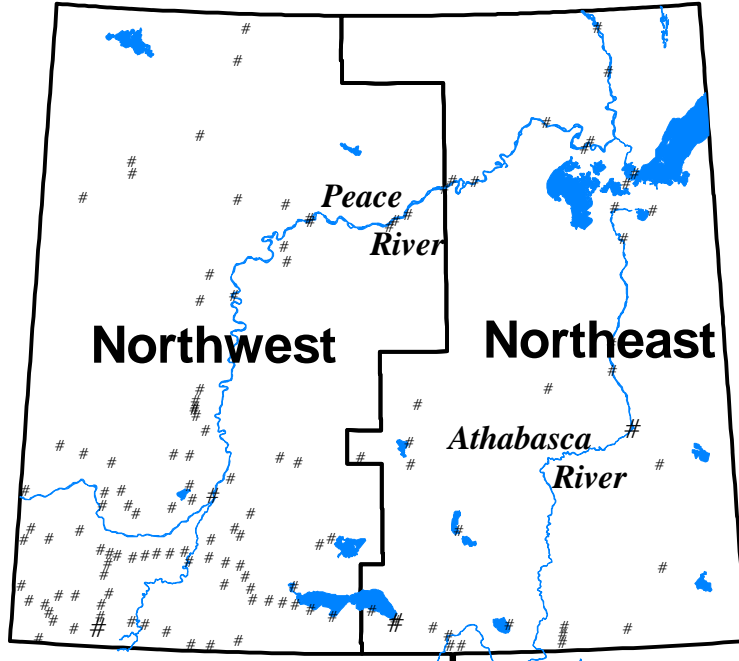


Fig. 2.4. Distribution of towns and hamlets in northern Alberta. Division into east and west is based on Municipal District boundaries. Southern boundary is 55 degrees latitude. (Map: Forest Watch Alberta)

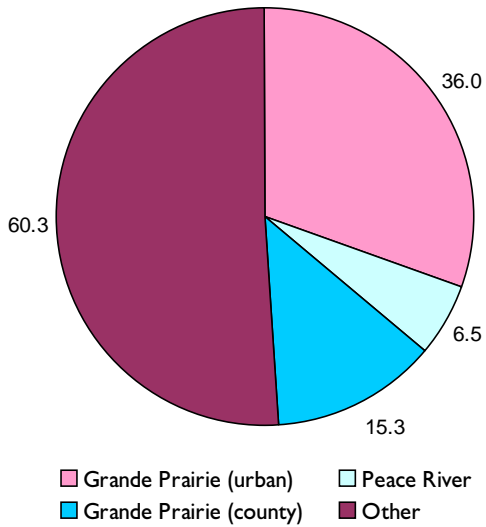


Fig. 2.5a. Distribution of population in northwest Alberta in 2000 (thousands). Source: AMA, 2001.

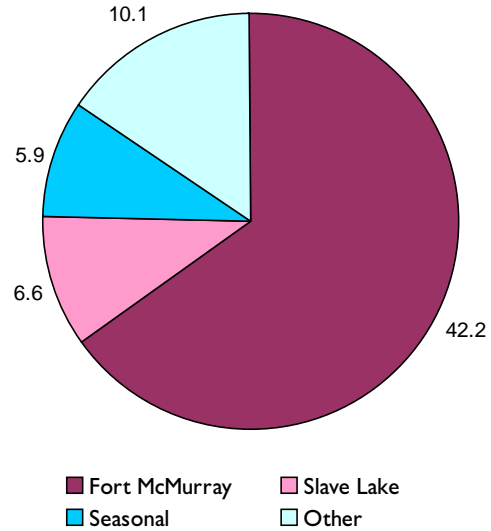


Fig. 2.5b. Distribution of population in northeast Alberta in 2000 (thousands). Source: AMA, 2001.

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elled until after World War II (Wetherell and Kmet, 2000: 192).

In the east, a railway from Edmonton to Waterways, near Fort McMurray, was completed in 1922, which led to the emergence of Fort McMurray as the new gateway to the north, in place of Athabasca. The Athabasca River continued to serve as the major transportation corridor north of Fort McMurray throughout the first half of the century. A highway to Fort McMurray was not completed until the 1960s.

The basic highway system established in the first half of the 20<sup>th</sup> century did not change substantially in later decades. Major routes were paved and secondary roads were improved and gravelled, primarily within the White Zone (Fig. 2.6). The major change that occurred during the latter half of the century was a profound increase in low-grade access to the forest. By 2000, access

routes developed by the petroleum and forest industries had permeated almost all of northern Alberta (Fig. 2.7). The only area that remains relatively inaccessible at present is land adjacent to Wood Buffalo National Park, which (not coincidentally) is the only part of Alberta not underlain with petroleum deposits (ERCB, 1992).

## Agriculture

The early history of agriculture in northern Alberta is similar to the history of homesteading in the Peace River region, as previously described. Although most early farmers engaged in mixed farming to some degree, their primary focus was the production of grain crops. Consequently, the expansion of agriculture was coincident with the rapid clearing and cultivation of forested land (Fig. 2.8). After World War II the rate of forest

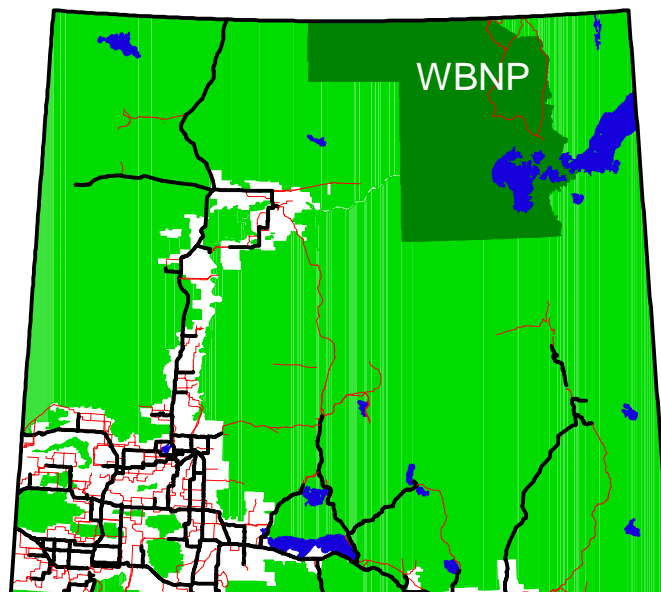


Fig. 2.6. Distribution of paved roads (black) and major gravelled roads (red) in northern Alberta, overlaid on the boundaries of the Green Zone and White Zone. (Map: Forest Watch Alberta)

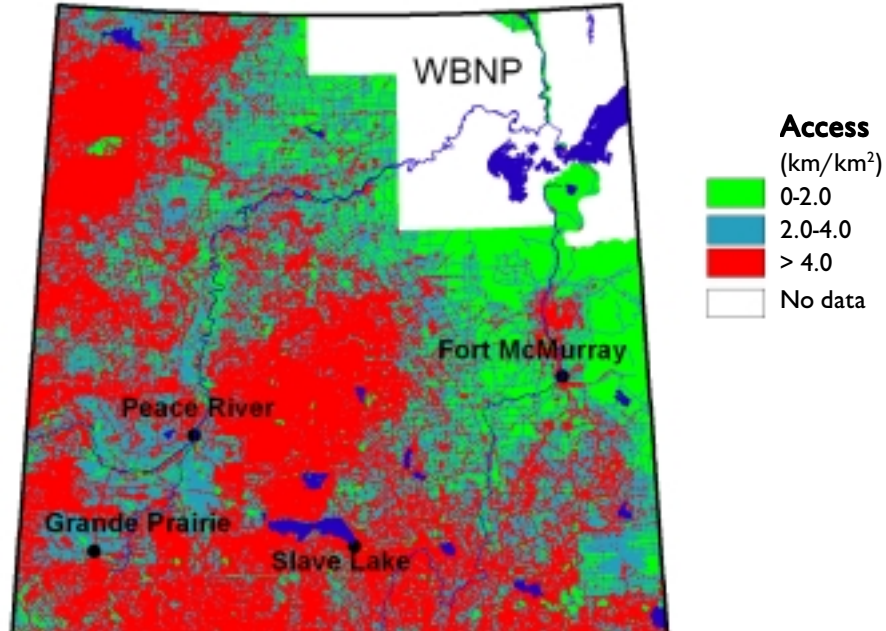


Fig. 2.7. Access density (km/km<sup>2</sup>) in northern Alberta in 2000. Seismic lines and trails were included in the analysis. (Map: M. Sawyer for Global Forest Watch Canada –methodology described in Smith and Lee, 2000: 105)

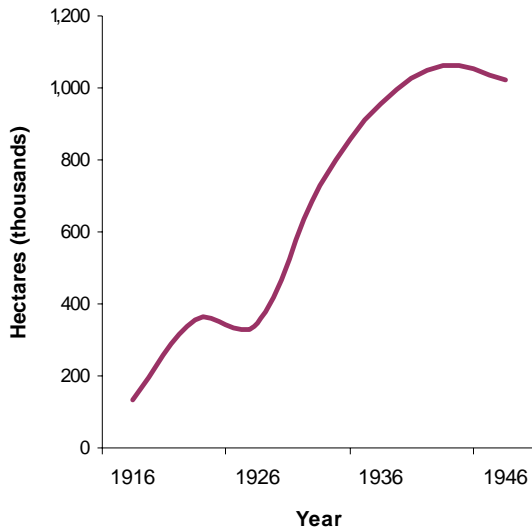


Fig. 2.8. Area of grain crops in the Peace River Country, 1906-1946. Source: Wetherall and Kmet, 2000: 262.

conversion accelerated, as higher incomes and increasing use of tractors permitted faster clearing (Wetherell and Kmet, 2000: 278).

Agriculture continued to dominate the economy of the Peace River region in the latter half of the century, and the conversion of forest to agricultural use continued as well. In the 1991 edition of Environment Canada's *State of Canada's Environment Report*, the Peace River region was described as "Canada's fastest-advancing agricultural frontier" (EC, 1991: 5-9). Between 1961 and 1986 the proportion of land converted to agricultural use in this region rose from 26.3% to 46.2% (EC, 1991: 5-9) (Fig. 2.9). The Environment Canada report (1991: 5-9) also concluded that much of the land that was converted to agricultural use was in fact best suited to for-

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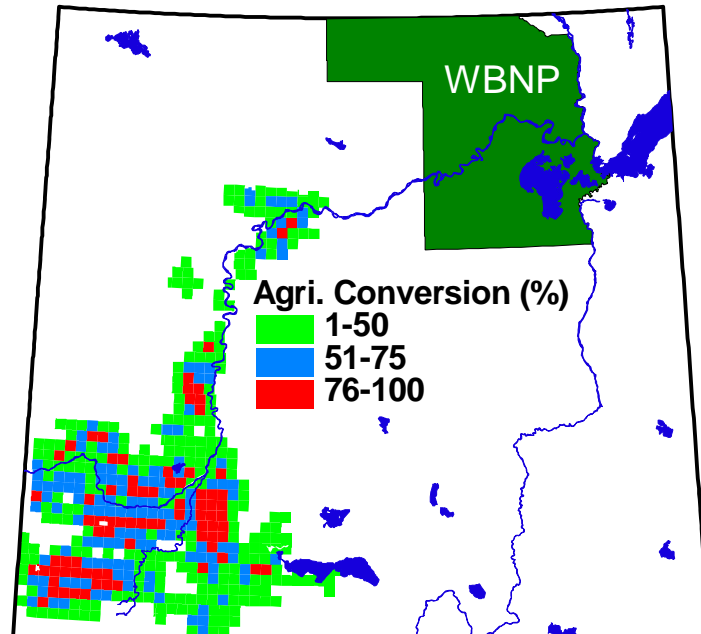


Fig. 2.9. Percent conversion of forest to agricultural use in the White Zone in 1996, by township. (Map: Forest Watch Alberta, based on Prairie Farm Rehabilitation Administration data)

estry and that the rapid rate of forest conversion threatened the sustainability of wildlife habitats in the region.

In addition to grain farming, northern Alberta also supports a significant livestock industry. This primarily involves various types of cattle operations, production of forage crops on private land, and grazing on public lands. As of 2001 there were 2817 grazing dispositions on public lands north of the North Saskatchewan River totalling 1.01 million ha (AAFRD, 2001).

### Harvesting of Wildlife

The following sections deal with the commercial aspects of harvesting wildlife. It should be noted that in addition to direct effects on the species

being harvested, trappers, hunters, and anglers also exert significant influence on forest structure through their use of and demand for access. Once roads or seismic lines are constructed by resource companies, this group of users typically resists efforts to close or reclaim the new access routes. In addition, the continued use of trails and seismic lines by off-road vehicles and snowmobiles has been cited as a factor in delaying natural regeneration of these routes (Revel et al., 1984: 19).

#### *Trapping*

The rate of trapping initially increased after 1900 due to generally rising prices, improved access, and the influx of white settlers who engaged in trapping during the winter months. This increased rate of trapping resulted in a decline in

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furbearer populations (Wetherell and Kmet, 2000: 376). In response, the province began regulating harvests, eventually implementing a registered trapline system in 1939. Falling fur prices and increasing production of farm-raised fur also served to moderate trapping rates after the late 1920s (Wetherell and Kmet, 2000: 364).

In recent decades the demand for wild fur has declined significantly. There are currently approximately 2300 trappers in the province, though few of these rely on fur sales as their sole source of income (Stelfox and Wynes, 1999: 10-47; ASRD, 2001a). In 2000/2001 the total return from wild fur sales in Alberta was approximately \$2.1 million (ASRD, 2001a). Most furbearer populations (Table 2.1) are now considered stable, with the exception of wolverine. Wolverine populations have declined in most regions of Alberta and the species is considered to be at risk of extinction if current trends continue (Peterson,

1997). In spite of these negative trends, and knowledge that wolverines reproduce slowly, trapping of this species continues to be permitted (37 caught in 2000) (ASRD, 2001b).

### *Hunting*

Although the sale of wild meat was banned in 1922, sport hunting continues to be an important contributor to the northern economy. Commercial aspects include professional guiding and outfitting, and the provision of other support services (e.g., food, gas, lodging, equipment, etc.). Altogether, big game hunters contributed approximately \$172 million to the provincial economy in 1996, much of which was expended in the north (McFarlane et al., 1998).

The sale of wildlife certificates (required by hunters to obtain a hunting licence) has significantly declined over the past two decades (ASRD, 2001c). In the past five years, sales have been at

**Table 2.1. List of animals trapped and hunted in Alberta in 2001.**

Species Trapped	Mammals Hunted	Birds Hunted
Badger	Bighorn Sheep	Mallard Duck
Beaver	Black Bear	Pheasant
Coyote	Cougar	Blue Grouse
Fisher	Coyote	Canada Goose
Lynx	Elk	Gray Partridge
Marten	Grizzly Bear	Merriam's Turkey
Mink	Moose	Ptarmigan
Muskrat	Mountain Goat	Ross's Goose
Otter	Mule Deer	Ruffed Grouse
Red Fox	Pronghorn Antelope	Sharp-tailed Grouse
Red Squirrel	White-tailed Deer	Snow Goose
Weasels	Wolf	Spruce Grouse
Wolf		Whitefronted Goose
Wolverine		

Source: SRD, 2001a; SRD,2001c.

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their lowest level since these certificates came into use in 1964 (ASRD, 2001c). There has also been a long-term trend in the province to increased regulation, including limits on which animals can be taken, seasons, bag limits, and so on. These developments would suggest a declining risk to hunted populations. However, the dramatic increase in access in northern Alberta in recent decades presents a significant new risk factor. Increased access is of particular concern in light of continued poaching and sale of poached meat throughout the north. Furthermore, there are now few areas in the north that function as wildlife reserves, in which wildlife populations experience little or no hunting pressure.

Most hunted species in Alberta (Table 2.1) are currently considered to be relatively stable, with the exception of grizzly bears. Grizzlies are on the provincial “blue list”, indicating that they may be at risk of extinction (AEP, 2000). In spite of this designation, the province continues to permit an annual grizzly hunt. Although few animals are actually killed, the hunt is completely contrary to efforts to maintain the viability of this species.

Even though moose populations are not considered to be at risk of extinction, concerns have been expressed by subsistence and recreational hunters about declining moose numbers (AEP, 1998a). Population surveys in northern Alberta have shown that the density of moose decreases with proximity to roads (Schneider and Wasel, 2000). In response, the province is proposing to “*move from a simple management system appropriate for a low human population and an unlimited moose supply to a more sophisticated management system appropriate for a larger and growing human population and greatly increased access to moose range.*” (AEP, 1998a).

## Fishing

Commercial fishing became viable in northern Alberta only after rail links were established, making it possible to transport fish to southern markets in a fresh state. Once these rail links were in place the fishing industry expanded rapidly (Fig. 2.10), and with it a cycle of depletion of stocks and search for new unexploited lakes (Wetherell and Kmet, 2000: 339). Once the supply of new lakes and healthy fish stocks was exhausted, the commercial fishing industry in Alberta collapsed (Fig. 2.10). From a high of almost 8000 commercial operators in 1959, there remain today less than 1000 operators (SC, 1983; AEP, 1998b: 108). Lake whitefish and tullibee make up about 80% of the current commercial catch, with the remainder made up of northern pike, walleye, and incidental catches (AEP, 1998b: 108b). The total commercial catch in Alberta in 1997 was

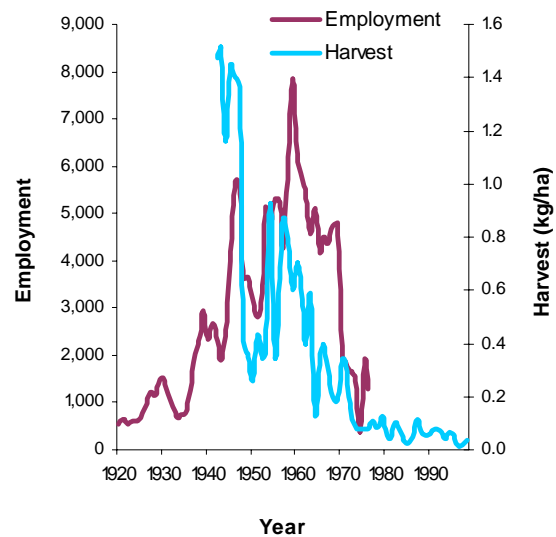


Fig. 2.10. Number of commercial fishing operators in Alberta and rate of commercial walleye harvest: 1920-1998. Sources: SC, 1983 and AB Environment records.

worth \$2.8 million (Stelfox and Wynes, 1999: 10-41).

In the latter half of the 20<sup>th</sup> century, sport fishing overtook commercial fishing as the dominant form of fish harvesting. The number of sport anglers increased steadily until the early 1980s, and then declined by about 35% in the latter half of that decade (ASRD, 2001d). Since the early 1990s the number of anglers has been relatively stable. It is estimated that about 350,000 people fished in 2000 (ASRD, 2001d) and that approximately 80% of the total fish catch in Alberta now goes to sport anglers (AEP, 1998b: 108). Yellow perch, northern pike, walleye, and trout species account for 95% of the sport catch. Approximately \$349 million were spent on sport fishing in Alberta in 1994, including expenditures on gear (Stelfox and Wynes, 1999: 10-33).

Even though sport fishing is highly regulated, the rate of harvest does not appear to be sustainable. There are simply too many anglers relative to the number of fish-bearing lakes and streams in Alberta. With the tremendous increase in access throughout the north in recent decades, fish stocks have come under extreme pressure. For example, in Wolfe Lake, 2000 anglers per year caught an average of 0.25 fish per hour in the early 1980s, but by the 1990s 10,000 anglers per year experienced a catch rate of only 0.02 fish per hour (Post et al., 2002). Twenty-one of 27 walleye populations for which data exist have collapsed as a result of overfishing. Pike populations now also show evidence of overexploitation leading to collapse (Post et al., 2002). Finally, arctic grayling and lake sturgeon have each been listed as a species of special concern in Alberta as a result of declining populations and vulnerability to angling pressure and habitat destruction (AEP, 1999).

### Forest Industry

At the turn of the 20<sup>th</sup> century most timber cutting in northern Alberta was for the production of firewood; thus, the overall rate of harvest was negligible. However, incoming settlers created a demand for milled timber, which increased steadily through the early decades of the century. There was also a demand for railway ties created by the rapid expansion of the railway system. The demand for milled timber was met by numerous small mills that were generally located close to their markets. These mills were owned by local families or small businesses and most operated only part-time.

The basic pattern of local mills serving local markets prevailed in northern Alberta throughout the first half of the century. Exports were limited because high rail freight rates effectively made northern lumber uncompetitive in southern markets where cheaper alternative supplies were sufficient to meet existing demand (Wetherell and Kmet, 2000: 347). As a consequence, northern Alberta contributed only a small proportion of provincial lumber output prior to World War II (Wetherell and Kmet, 2000: 346).

The post-war period marked a turning point in the development of the forest industry in Alberta. The War brought the economy out of its prolonged depression and the demand for lumber increased dramatically. By the late 1940s, harvest rates in Alberta were more than three times what they had been during the 1930s (Fig. 2.11). Although most of the expansion occurred in the south, the increased post-war demand, together with decreased transportation costs and increased access, stimulated an expansion of the forest industry in the north as well and initiated

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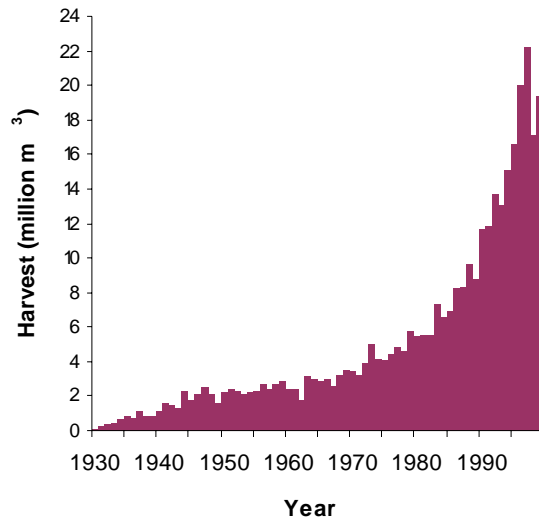


Fig. 2.11. Volume of forest harvested in Alberta, 1930-1999. Source: Stelfox and Wynes, 1999: 9-17.

a shift towards export markets (Wetherell and Kmet, 2000: 348).

The increased rate of harvest in the post-war period was accompanied by a profound shift in government policy. Prior to this period, regulation of the industry was minimal. Companies generally moved from site to site, selectively removing the largest and most valuable trees. There were no regeneration efforts and no long-term planning for the maintenance of timber flow. This approach seemed acceptable while the overall rate of harvest was low, but as the industry expanded it was felt that a new approach was required that would ensure sustainability of the timber supply. The government also became interested in attracting pulp and paper companies to the province and establishing other large wood processing facilities, such as plywood and chipboard plants (Pratt and Urquhart, 1994: 14). To this

end several important initiatives and changes were implemented:

- the Alberta Forest Service was established (1948), providing the basis for administering and servicing the expanding forestry sector;
- the Green Zone was established (1948), restricting the encroachment of agriculture onto lands best suited for forestry;
- the *Forests Act* was proclaimed (1949) and several new policies were implemented, including area-based agreements, 20-year renewable leases, and sustained-yield management;
- a detailed forest inventory was initiated (1949) to define the available wood supply (a requirement for attracting large forestry projects); and
- a fire suppression system was implemented to protect what was increasingly considered a valuable resource.

The fundamental objective of the new sustained-yield management approach was to ensure a stable flow of timber over a long planning horizon (100 years or more). Simply put, this meant that the rate of harvest in a planning area was not to exceed the rate of forest growth, less losses to natural causes. In order to maximize harvest rates under this regime, forest companies abandoned the practice of selective cutting and began implementing clear-cut harvesting and artificial regeneration (ECA, 1979: 69). In effect, forest stands began to be considered slow-growing crops, amenable to the growth and harvest strategies employed in agricultural settings. Concerns about the habitat needs of wildlife (particularly game species) resulted in the progressive implementation of various restrictions on operating practices;

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however, the primacy of timber production remained intact.

The post-war period also marked a transition to greater economies of scale, as efforts were made to increase productivity. Mills and forestry operations became larger and more capital intensive, and increasing use was made of technology and mechanization. As a consequence of these trends, small-scale family-based operations serving local markets were slowly eclipsed by large-scale operations dominated by national or multi-national corporations serving export markets primarily. By the mid-1970s, seven companies processed approximately 80% of the timber cut in Alberta and two-thirds of this output was shipped to the United States (Pratt and Urquhart, 1994: 30).

The next major turning point in the development of Alberta's forest industry came in the late 1980s. A unique alignment of factors during this period resulted in the near-simultaneous development of more than a dozen major wood-processing facilities, including five new pulp mills (Nikiforuk and Struzik, 1989). The bulk of this expansion occurred in northern Alberta where vast tracts of forest were brought into industrial production for the first time (Fig. 2.12). Once the new facilities were fully operational, the rate of harvest in Alberta grew to more than five times what it had been in the 1970s (Fig. 2.11).

A key factor responsible for the forestry developments of the late 1980s was the collapse of oil prices earlier in the decade. This collapse led to government policies that were intended to diversify and stabilize the provincial economy. Forestry, which heretofore had received little attention from the government, was identified as one of the key platforms for diversification. Another important factor in the expansion was that pulping technology had advanced sufficiently by

the 1980s to enable the cost-effective pulping of hardwood species. This was critical because aspen is the most common tree species of northern Alberta. Up to that point aspen had been considered a "weed" species that reduced the desirability of northern forests for large-scale forestry. Finally, after languishing throughout the 1970s, pulp prices rose in the 1980s to the point where the construction of new plants became economically feasible (Pratt and Urquhart, 1994: 51).

The government's plan for expanding the forestry sector in the late 1980s assumed that stable employment and full utilization of the resource (i.e., both hardwoods and softwoods) were paramount. Consequently, a decision was made to focus on large international forestry companies instead of fostering the development of smaller Alberta-based companies (Pratt and Urquhart, 1994: 64). Local companies were not thought to have the capacity, technical knowledge, or capital to operate at the large scale required to make pulp production in northern Alberta viable. In addition, it was felt that large, vertically integrated companies would be better able to weather cyclical downturns in the market. The government also held the assumption that only a short window of opportunity existed before the next downturn in pulp prices would make the construction of new plants uneconomical again (Pratt and Urquhart, 1994: 59).

In order to achieve its expansion objectives within the perceived limited window of opportunity the government dispensed with public hearings, integrated resource planning, and environmental research. Instead, in 1987 it launched a series of closed-door negotiations that resulted in the leasing of timberlands the size of Great Britain, the awarding of \$1.2 billion in loan guarantees and debentures, and commitments for

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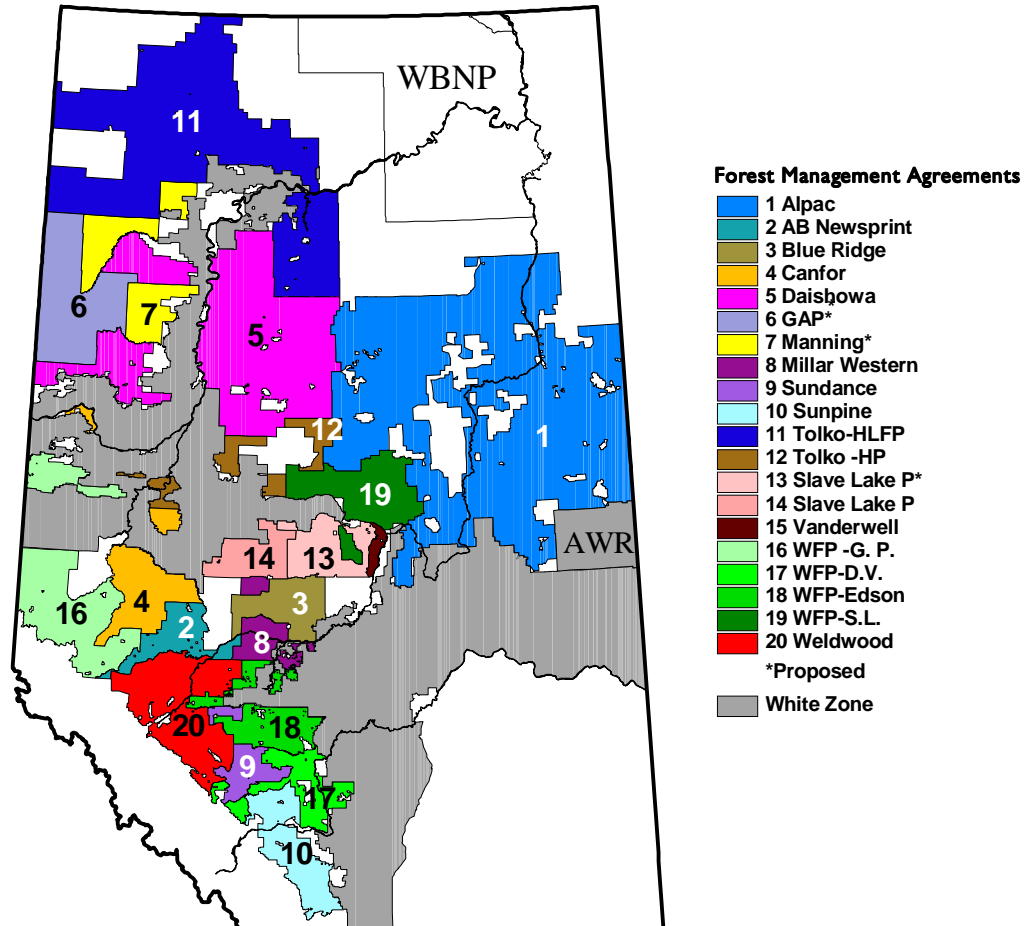


Fig. 2.12. Location of Forest Management Agreement areas as of 2000. FMAs 6, 7, and 13 are only in the proposal stage. FMAs 10 and 20 are owned by International Paper Co. FMAs 3, 13 and 14 are owned by West Fraser Forest Products. WFP = Weyerhaeuser Forest Products. AWR = Air Weapons Range. (Map: Forest Watch Alberta)

an additional \$170 million in infrastructure development — all in the space of 16 months (Pratt and Urquhart, 1994: 6). The larger projects were eventually subjected to environmental impact assessments; however, this was done in the absence of a cumulative impacts framework. Furthermore, the terms of reference for these assessments were narrowly focussed on the mills, and specifically

excluded the impacts of woodland activities (Pratt and Urquhart, 1994: 183).

Despite massive protests and challenges, the initial set of projects proceeded. However, additional planned developments in the 1990s did not, largely due to changing market conditions. The slow-down of the 1990s supports the government's contention that it had to act rapidly in

1987 if the projects were to proceed. The larger issue of whether the rush to develop large pulp and paper mills served the public interest remains to be proven.

### Petroleum Industry

The presence of oil in northern Alberta was well known prior to the turn of the 20<sup>th</sup> century. Bitumen (a semi-solid oil product, like roofing tar) was observed in seeps along the Athabasca River and other locations and was used by natives and explorers to caulk the seams of their birchbark canoes. By the late 1800s the Geological Survey of Canada had already made preliminary explorations in northern Alberta and a few test wells had been drilled (Wetherell and Kmet, 2000: 30). These explorations determined that large deposits of oil sands (a mixture of sand, water, and bitumen) were present, as well as natural gas.

Because conventional oil was not found in the initial surveys, little development of northern petroleum resources was undertaken in the first half of the century. However, the federal and provincial governments did conduct research into commercial applications for bitumen and into the development of efficient methods of processing oil sands (Wetherell and Kmet, 2000: 354). During this period test extraction plants were put into operation near Fort McMurray and some road paving projects were undertaken, but there was no significant commercial production (PCF, 2000: 8-9).

Dramatic changes in the petroleum industry in Alberta occurred after a major oil discovery was made in Leduc in 1947. Other large reservoirs were soon found and these discoveries brought skilled energy industry personnel to Alberta and attracted the attention of international oil com-

panies and investors. An infrastructure of pipelines and refineries was quickly established, and Alberta's oil boom was underway.

Although the initial strikes were made in the south, development of northern petroleum reserves quickly followed. The gas fields in the Peace Country, where access had already been established, were brought into production first. In subsequent decades, petroleum development spread throughout the north, with the exception of the Shield region in the northeast which did not contain petroleum deposits (Fig. 2.13).

The rate of conventional oil and gas development was largely determined by economic factors. When oil and gas prices were high in the 1970s, and again in the 1990s, the rate of drilling increased rapidly (Fig. 2.14). At no time were regulations implemented to limit the pace of petroleum development in order to maintain forest sustainability, even though significant forest impacts had already been identified by the 1970s (ECA, 1979: 27). There was no restriction on the rate of timber cutting for wellsites, seismic exploration, pipelines, or roads, and there was no requirement for forest regeneration (see Chapter 4). Because most petroleum activities resulted in semi-permanent deletions of forest, the cumulative ecological "footprint" of the petroleum industry increased dramatically with each subsequent decade (Figs. 2.7; 2.13-2.16).

The development of the oil sands lagged behind the development of conventional oil and gas reserves, largely because they were more difficult and expensive to recover. The first full-scale commercial operation, the forerunner of today's Suncor Energy Inc., did not begin production until 1967 (PCF, 2000: 10). In 1978, Syncrude began operations, after the federal and provincial governments invested in the project and provided

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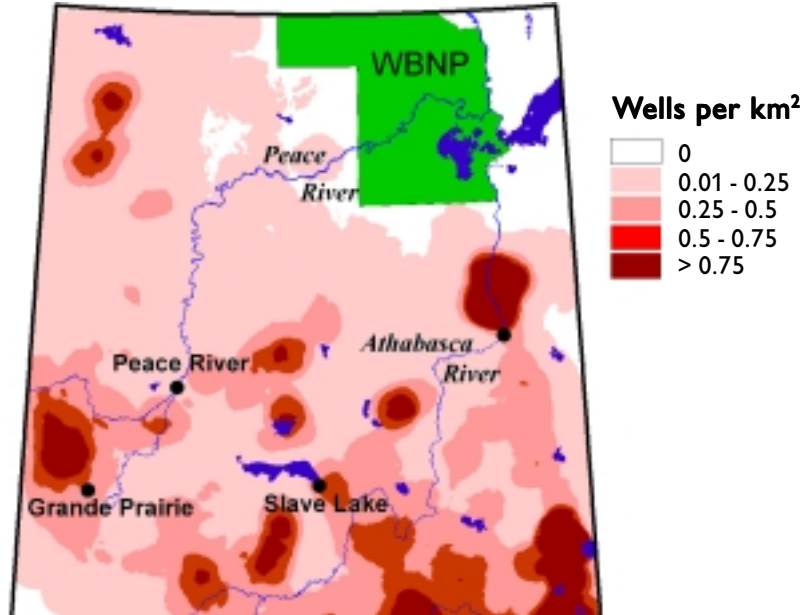


Fig. 2.13. Well density in northern Alberta in 2000. (Map: Forest Watch Alberta)

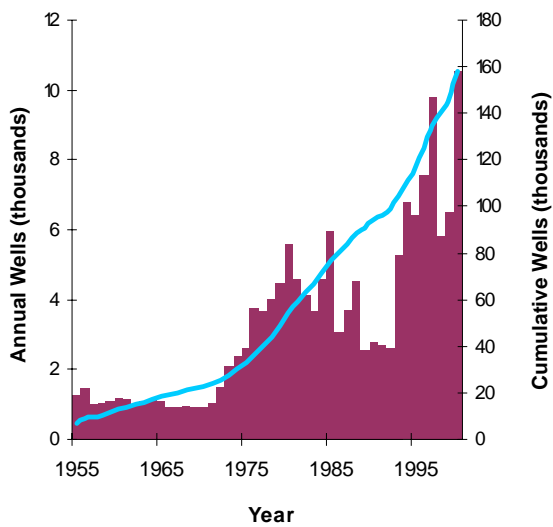


Fig. 2.14. Number of oil and gas wells completed in Alberta, annual (bars) and cumulative (line): 1955-2000. Source: CAPP, 2000.

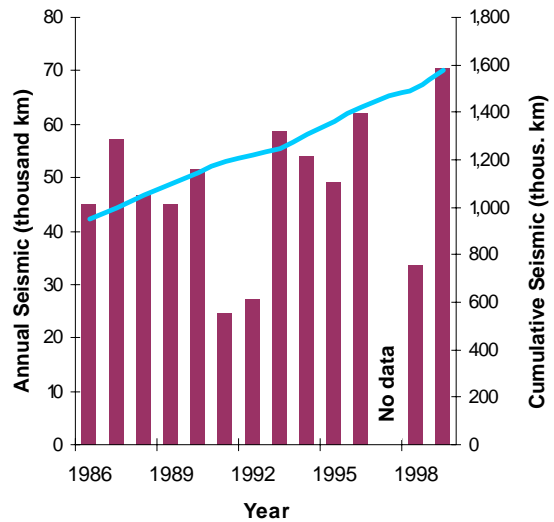


Fig. 2.15. Length of seismic lines approved in the Green Zone, annual (bars) and cumulative (line): 1986-1999. Source: AEP, 1998b: 79 and ASRD records.

## Chapter 2 ♦ History of Industrial Development

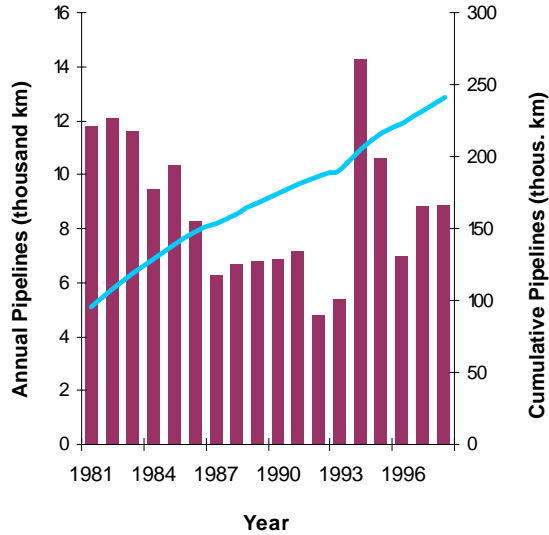


Fig. 2.16. Length of new oil and gas pipelines in Alberta, annual (bars) and cumulative (line): 1981-1998. Source: CAPP, 2000.

assurances about financial terms (PCF, 2000: 10). Both of these operations were essentially mines that extracted oil sands near the surface (Fig. 2.17). Economically-viable techniques for recovering deeply buried oil sands deposits (in-situ bitumen) were subsequently developed, opening a much larger segment of the oil sands deposits to production (Fig. 2.17). Once oil prices recovered in the 1990s, and favourable changes in royalty structure were instituted, development of the oil sands increased dramatically. The total proposed new investment in oil sands projects announced since 1996 now totals over \$50 billion (ARD, 2001: 15).

The rapid expansion of the oil sands industry in the late 1990s had many parallels with the expansion of the forest industry in the late 1980s. In the case of the oil sands the government did not offer loan guarantees, but effectively achieved

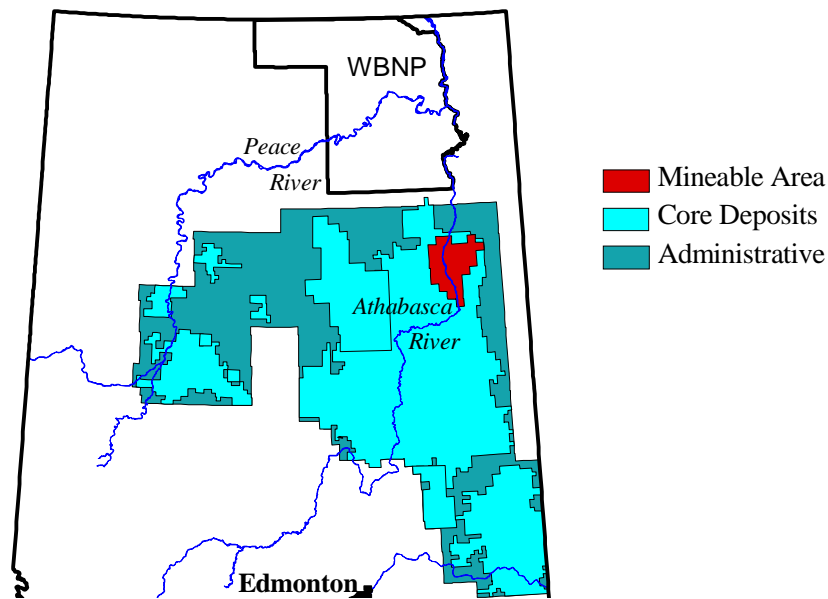


Fig. 2.17. Distribution of oil sands deposits in Alberta, showing total deposits and area amenable to surface mining. Source: AEUB, 2000.

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the same result through a reduction of royalty fees (Fig. 2.18). Project approvals were again made in haste, without consideration of the cumulative impacts on the forest. One significant difference from the forestry expansion was that there was relatively little public reaction, perhaps because the individual projects were small relative to the size of the Forest Management Agreements awarded to Alberta-Pacific and Daishowa-Marubeni. The dependence of the province on oil and gas revenues may also have played a role in limiting public reaction.

## Other Industries

Other industrial sectors in northern Alberta will not be discussed in detail. Salt mining occurred in the Fort McMurray region early in the century, but is not a significant enterprise at this time. Peat

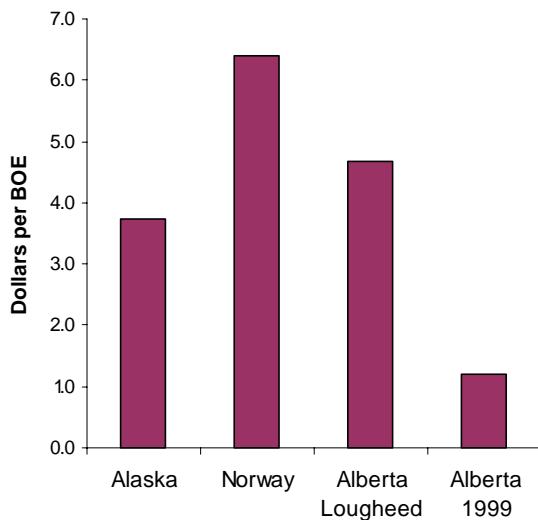


Fig. 2.18. Government oil and gas revenues per barrel of oil equivalent (BOE), in 1996 dollars. Source: MacNab et al., 1999.

harvesting has been expanding, but at present is very limited in extent. There has also been interest in diamond mining in recent years, though no operational mines have been constructed.

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