

Part I

The Old Way



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1. Introduction

For many Albertans, the northern forest is synonymous with the concept of wilderness. It is a place for fishing and camping trips, where one might hear the call of a loon or the howl of a wolf. Perhaps, with a bit of luck, a chance encounter with a moose or a bear. Most importantly, the north is thought of as a place where nature prevails, in contrast to the southern plains that have largely been tamed by man.

Although loons and bears are still to be found, the face of the north is rapidly being transformed. Yesterday's wilderness is today's "resource". Each year, thousands of hectares of old-growth forest are replaced by clear-cuts, thousands of additional hectares of productive forest are converted to oil and gas wellsites, and tens of thousands of kilometres of new seismic lines, roads, and pipelines fragment the remaining forest landscape. Only the far northeast corner of the province is not being significantly affected, by virtue of the fact that petroleum deposits and commercial forest are largely absent there. By analogy, the current industrial complex and associated regulatory framework represent a freight train that is rapidly moving the forest down a new track. The question is, are we rolling in the right direction?

Given that most of the northern forest in Alberta is publicly owned, the desired future forest is defined by the values held by the citizens of Alberta. These values have

been clearly articulated in the *Alberta Forest Conservation Strategy* (AFCS), the result of more than three years of dedicated effort by over 800 Albertans representing the full spectrum of forest stakeholders (AFCSSC, 1997). As expressed in the AFCS (AFCSSC, 1997: p. 3), the desired goal is:

To maintain and enhance, for the long term, the extent and health of forest ecosystems in Alberta for the sake of all living things locally, provincially, nationally and globally, while providing environmental, economic, recreational, social and cultural benefits for present and future generations.

This statement includes several important concepts. First, it says that we are concerned with the state of the forest over the long-term. Second, it says that the forest should provide economic benefits, but these economic benefits do not have primacy over other benefits, nor are they to be derived at the expense of the health of the forest. Finally, the forest should continue to meet the needs of other species besides our own.

Although the provincial government accepted the vision, goal, and principles of the AFCS (AEP, 1998: p. 7), the system of forest management that is currently in place seems unlikely to achieve the objectives of the *Strategy*. In part, this is because there exists no plan for achieving those objectives. Broad policy statements and good intentions notwithstanding, current management continues to be focussed on maximizing economic returns over a short planning horizon. Ecological objectives, to the extent that they are addressed at all, are largely handled through local mitigation efforts. A long-term planning framework with clearly defined ecologi-

cal objectives that integrates the activities of resource companies and places limits on cumulative industrial impacts is completely lacking. Finally, there is no system for effectively monitoring the changes in forest structure that are occurring, or determining their impact on forest wildlife, now and into the future.

Although it does not seem likely that the current system of forest management will achieve the future forest envisaged in the AFCS, this does not imply that the objectives of the *Strategy* cannot be realized. A viable alternative approach to forest management has been developed and refined over the past decade by researchers from around the world. Local research organizations, including the Sustainable Forest Management Network (headquartered at the University of Alberta) and the Alberta Research Council, have been important contributors to this field.

The new approach to management, usually referred to as Ecological Forest Management (EFM) or Ecosystem Management, emphasizes the maintenance of natural forest structures, patterns, and processes. This is accomplished through changes in planning and practices whereby industrial disturbances are made to approximate natural disturbances such as fire, to the greatest extent possible. In addition, the forest is carefully monitored for signs of unexpected changes, so that management plans can be adjusted prior to the development of serious problems. Plans are also adjusted in response to new scientific information as it becomes available. EFM is further characterized by a precautionary approach that includes the use of protected areas for risk management (among other roles). Finally, management decisions under EFM are made with public input and include a clear link to publicly defined values.

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In Part I of this book I review the current system of forest management and provide a detailed description of the ongoing transformation of the forest. My focus is on northern Alberta, north of 55 degrees (Fig. 1.1). I begin, in this chapter and the next, with a description of the forest and the history of industrial development from 1900 to 2000. In Chapters 3 and 4 I take an in-depth look at the two most important industrial sectors in northern Alberta, forestry and petroleum, as they are today. I conclude Part I with a projection of the future forest under the current management regime and a summary of the deficiencies of the current regime relative to the goals defined in the AFCS.

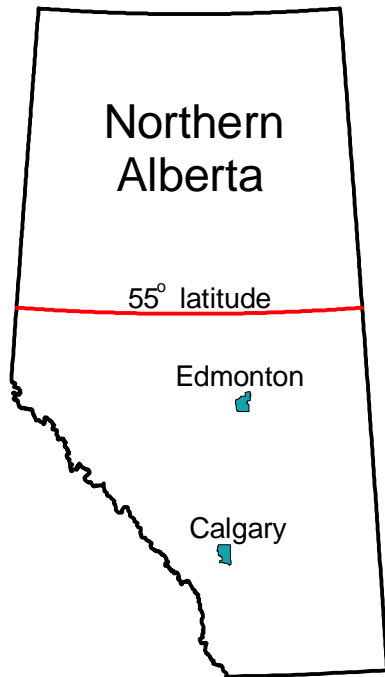


Fig. 1.1. The scope of this book is northern Alberta, defined as the region north of 55 degrees latitude.

In Part II of the book I outline an alternative approach to forest management, leading to an alternative future forest. This section is based on a synthesis of the recent scientific literature on EFM, in a form that is intended to be accessible to a non-technical audience. Chapter 6 is focussed on the natural disturbance model of forest harvesting, Chapter 7 reviews the role of protected areas in EFM, and Chapter 8 covers the special case of managing old-growth forest. In the final chapter I pull all the pieces together to describe what a workable system might look like and to provide some general conclusions. Although there can be no guarantees that EFM will achieve all of the objectives defined in the AFCS, there is little doubt that it stands a much higher probability of doing so than the current system.

Alberta's Boreal Forest

The forest of northern Alberta is part of the vast boreal forest that spans Canada and the globe (Fig. 1.2). South of the boreal forest is the aspen parkland forest, transitional between the boreal and grasslands. North of the boreal (beyond Alberta's border with the Northwest Territories) is the open forest of the Canadian Taiga.

As typical of boreal systems, the winters in northern Alberta are long and cold and the summers are short and cool. Precipitation is moderate but variable. In some years, extended hot and dry conditions lead to large fires that occasionally burn hundreds and even thousands of square kilometres of forest (in Chapter 6 I provide a detailed review of fire patterns in northern Alberta).

The surface features of northern Alberta are quite varied. The influence of the Rocky Mountains is evident in the foothills found in the southwestern quarter (Fig. 1.3). The rest of the region

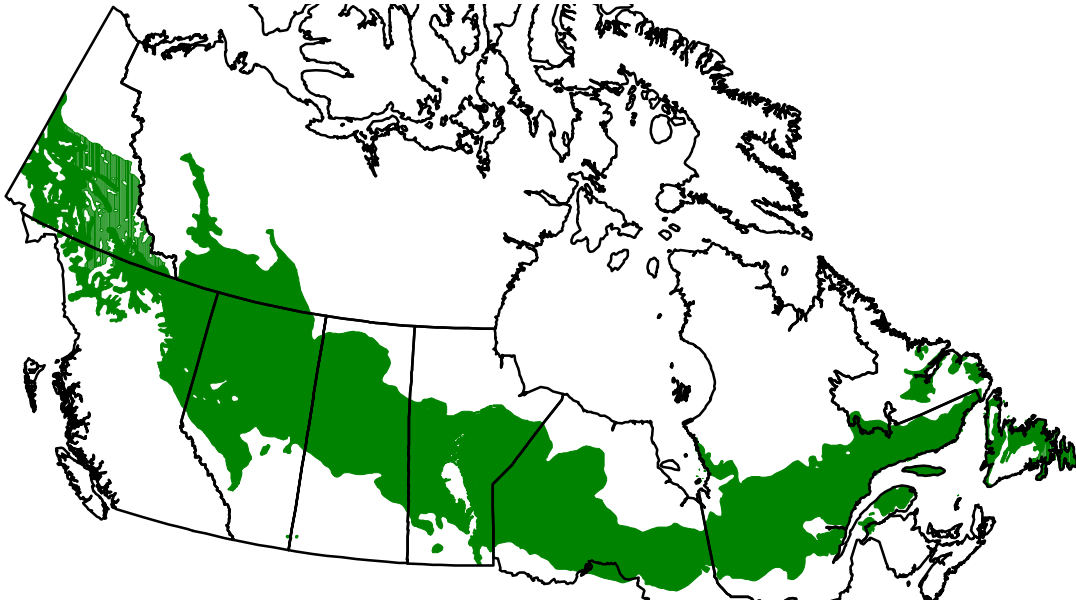


Fig. 1.2. Canada's boreal forest, as defined by the Canadian Forest Service. (Map: Forest Watch Alberta)



Fig. 1.3. Elevation map of northern Alberta. Higher elevations in brown; lower in green. (Map: Forest Watch Alberta)

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consists of broad lowland plains and discontinuous hill systems. With the exception of the foothills and a small area of Shield in the northeast, the bedrock is buried beneath deep glacial deposits.

Upland forests are typified by a mosaic of pure and mixed stands of aspen and white spruce (Stelfox, 1995: 1; Fig. 1.4). Pure and mixed stands of black spruce and larch (on wetter sites), and jack pine (on drier and sandy sites) are also common (Stelfox, 1995: 2). Other common deciduous trees include balsam poplar and white birch. At higher elevations, pure stands of lodgepole

pine, white spruce, black spruce, and subalpine fir are predominant. The mosaic of stand types characteristic of Alberta's boreal forest is the result of variability in local site conditions and cycles of disturbance and renewal (reviewed in Chapter 6).

Extensive wetlands are characteristic of the region. Peatlands, with open forests of black spruce and Labrador tea, are the dominant landform across approximately one-quarter of the area (Figs. 1.5, 1.6). Lakes are relatively rare, compared to other boreal systems. There are two major river systems in the region, the Peace and



Fig. 1.4. Examples of the boreal mixedwood forest typical of upland sites in northern Alberta. (Photos: D. Mussell, left; Al-Pac, right)

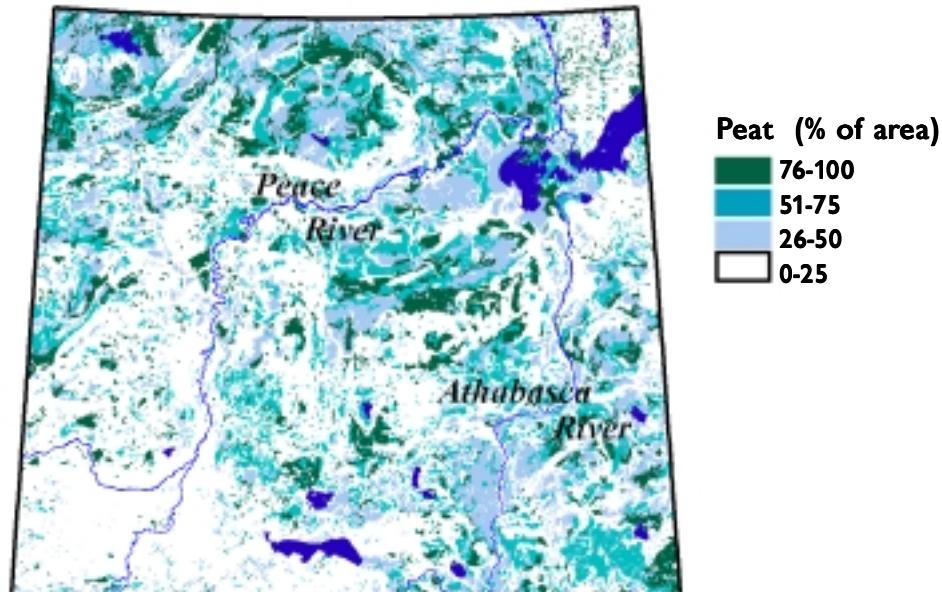


Fig. 1.5. Distribution of peatlands in northern Alberta. Source: Vitt et al., 1998.



Fig. 1.6. Typical wetland in northern Alberta. (Photo: Canadian Parks and Wilderness Society)

Athabasca, which drain into the Peace-Athabasca delta in the northeast (Fig. 1.5). This delta, which is one of the world's largest inland freshwater deltas, drains into the Arctic ocean, primarily via the Slave River.

Because of variability in surface features, climate, and other attributes, Alberta's boreal forest is far from uniform. Regional differences exist and must be accounted for in any system of land use planning. To address this issue the provincial government developed a classification scheme that divides the province into a series of natural regions (AEP, 1994). Under this provincial scheme, Alberta's boreal forest is divided into three natural regions: the Boreal Forest proper, the Foothills, and the Shield (Fig. 1.7). The Boreal Forest Natural Region is in turn subdivided into six subregions, on the basis of vegetation, soils, and landforms (AEP, 1994).

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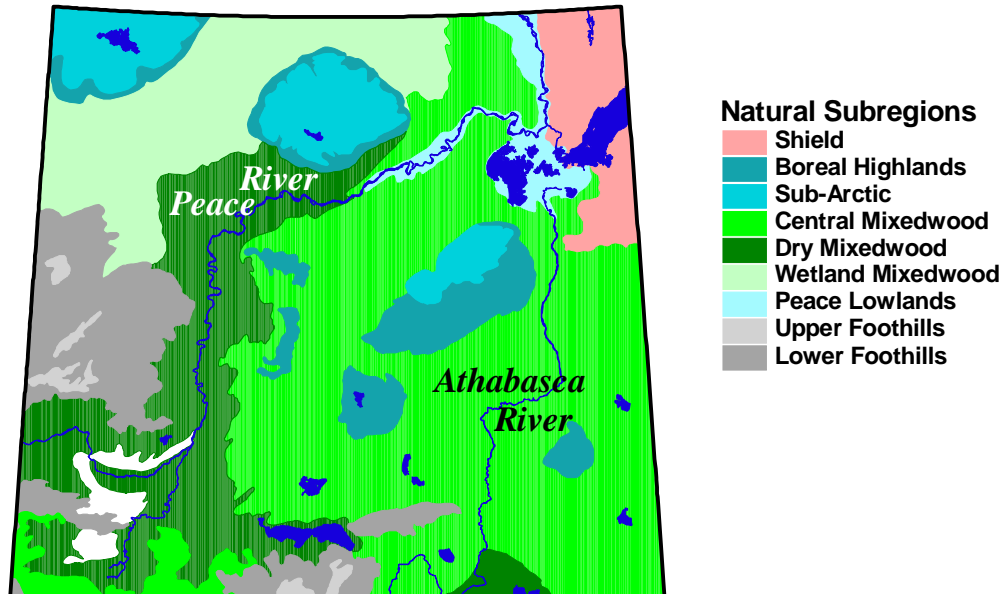


Fig. 1.7. The natural subregions of northern Alberta. (Map: Forest Watch Alberta)

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