

# **A Physical, Biological, and Land-Use Synopsis of the Boreal Forest's Natural Regions of Northwest Alberta**

including the  
Forest Management Agreement Area of  
**Daishowa-Marubeni International Ltd.**

and the Quota Holder Area of  
**Canadian Forest Products Ltd. (Hines Creek)**

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September 1999

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# Preface

## Chapter 1

Daishowa-Marubeni International Ltd. (DMI), operator of the Peace River Pulp Division Forest Management Agreement Area (FMA), in conjunction with Canadian Forest Products in Hines Creek, is developing an ecosystem-based approach to forest management in northwest Alberta. Their management ideology recognizes the need to concurrently manage economic, environmental, and social values on the FMA on a sustainable basis. Achieving this balance between fiber and non-fiber attributes will be achieved through a forest management plan that recognizes the importance of natural disturbance regimes and landform features in maintaining a “range of natural variability” on the landscape in terms of forest age, patch size, and forest structure. As such, DMI and CanFor recognize the need to describe the physical and biological structures of the landscape of northwest Alberta as a basis for wise management.

This synopsis provides a first approximation of spatial and temporal patterns in the physical, biological, and human-related structures that occur in northwest Alberta. By compiling and presenting information from a diverse set of physical, biological, and land-use features, this document provides a reference encyclopedia to assist industry, the public, the research community, and government managers with resource management decisions. An attempt has been made to emphasize appropriate spatial and temporal scales in examining the biophysical landscape of northwest Alberta and to consider human land-uses in terms of their cumulative impact.

The synopsis begins with a description of the physical features that are foundational to the character of northwest Alberta (Chapter 2). The region’s geological history, including the recent Pleistocene glaciation events are chronicled to assist the reader in understanding current topography relief, and surface and subsurface features. The network of moving (lotic) and standing (lentic) surface waters are described, as is the regional climate that drives the hydrological cycle. The complex interactions between physical elements of the ecosystem (geology, climate) provide the basis for ecological communities which occur in northwest Alberta (Chapter 3). The post-Pleistocene development of plant communities is discussed, and the various natural subregions that comprise the region, and the dominant biota which characterize them, are described. To the extent permitted by our understanding of the region’s biodiversity and current taxonomy, an inventory of plants and animals is provided. Greater attention is paid to the better known vertebrate families, as our knowledge of the dominant and important arthropods and microbes is grossly incomplete. The life history and management status of several “profile” species (trumpeter swan, woodland caribou, grayling, moose, wood bison) is addressed in recognition of their elevated social, economic, or conservation status. Chapter 3 also examines the current status of protected areas in the region of northwest Alberta.

Drawing on data collected from several regional inventories on forest structure, Chapter 4 provides a snap-shot description of the forest landscape in terms of patch age, patch size, and patch structure. The major successional pathways which characterize the region are described, along with the major structural differences that describe each of the seral stages of these pathways. The dynamic nature of plant communities is fueled by natural disturbance regimes, and Chapter 5 examines fire as a major physical force shaping the age and structure of the boreal forest landscape. It tries to answer three basic queries dealing with fire frequency, fire intensity, and fire size in northwest Alberta. The geographic patterns of fire are explored, as are the sources of fire (natural, anthropogenic), and the resulting forest structure created by fire events.

Having set the natural physical and biotic stage, humans and their suite of land-use practices are discussed in Chapter 6 through 10. Chapter 6 describes briefly the aboriginal communities, and how their lifestyles changed following the arrival of Euro-Canadians and the emergence of a fur trapping industry. The demographics of the current human population is addressed, including information on age and gender structure, natality, and mortality rates. Recent dynamics in the size of the regional human population are illustrated, accompanied by an explanation of major immigration events. The historical development of infrastructure (transportation, utilities, communication, electrical) and its current status are also described in Chapter 6.

Chapter 7 examines in greater detail the settlement of northwest Alberta by Euro-Canadians and specifically details the emergence of an agricultural landuse sector. The reader will be able to contrast the lifestyle of the early homesteaders to the vastly different scale of agricultural production in northwest Alberta today. The extensive

deforestation of the boreal forest landscape by agriculturalists in the White Zone is described, a process that set the stage for the historically important production of grains, forages, and livestock. Chapter 8 describes the history of the forest sector and the current character of this extensive landuse in northwest Alberta. Information compiled in this chapter include geographic locations of lumber and pulp mills, historical trends in harvest production of hardwood and softwood tree species, and the various harvest and regeneration strategies employed today. The energy sector is a major contributor to the regional economy of northwest Alberta (Chapter 9). The various footprints of this rapidly growing landuse are described, including those created by seismic lines, wellsites, access roads, processing facilities, and pipelines. Production levels of the energy industry are summarized, as well as the volume of forests harvested in conjunction with exploration, extraction and translocation of petrochemical products.

Although not conducted at the same scale of operation or with the same business principles as agriculture, forestry, or the energy sector, the activities of trapping, hunting, and fishing are also important landuse practices and contribute much to regional economies. Chapter 10 describes the spatial and temporal patterns of those wildlife species that are hunted, fished, or trapped, and provides some information on hunters, sportfishers, and trappers. Chapter 11 describes selected field research projects intended to assist DMI and CanFor in an adaptive management context by providing new insight into the structure and function of the boreal forest ecosystem. The synopsis concludes by providing a list of various relevant databases, a glossary, and a table of conversions (Chapter 12).

This document is not complete in detail or historical record, as many required data are not available. The synopsis does, however, represent a starting point that can be updated and expanded at appropriate intervals. The updating of sections dealing with meteorology, plant community structure, wildlife populations, and human land-uses are requisite to understanding changes to this landscape through “meaningful” time and across “meaningful” space.

Contemporary northwest Alberta is not a “pristine” landscape untouched by human landuse practices, but it does still retain landscape features and patterns that are largely determined by natural physical and biological elements and processes. Yet the pace of unfolding landuses in northwest Alberta is readily apparent, and the ecological, social, and economic influences of this emerging landscape transformation are undeniably far-reaching. There is, in all likelihood, one last opportunity to measure the “natural” spatial and temporal variance that characterizes biophysical features before the full suite of human landuses completes its transformation. The challenge before DMI and CanFor is to devise, adopt, and implement a forest landscape strategy that minimizes ecological risk while allowing for the persistence of an economically and socially acceptable forest industry in the region. The landscape model they have selected is one created by natural processes, and this synopsis attempts to describe those natural processes, the landscape, and the human landuse practices affecting them.

The considerable amount of information contained in this report precluded a general narrative approach; rather, most data are presented in tables, figures, or in brief summaries. Recognizing that much of the potential value of this document lies in its accessibility to a broad diversity of Albertans, an effort has been made to explain the landscape of northwest Alberta, and the numerous processes that shape it, in a manner accessible to the average reader.

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September 1999