Restoration and Reclamation of Boreal Ecosystems

Attaining Sustainable Development

Boreal ecosystems contain one-third of the world's forests and stored carbon, but these regions are under increasing threat from both natural and anthropogenic disturbances. Written by leaders from the forefront of private, public, and academic sectors, *Restoration and Reclamation of Boreal Ecosystems* emphasizes a broad, conceptual approach to the specific application of empirical research into development planning, restoration, and modeling of these ecosystems, the importance of which is highlighted at a time of global climate change as they act as carbon sinks. There is a focus on the reclamation of exploited ecosystems from a holistic standpoint, ranging from environmental and edaphic variables to the restoration of foundational flora. Recent advances in quantification of ecosystem services, such as habitat suitability and carbon storage modeling are also detailed. The book contains case studies that address how both historical and novel assemblages can provide ecosystem stability under projected climatic and land-use scenarios.

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Preface

The boreal forest, or taiga, is a mosaic of lakes, peatlands, and upland forests, all placed on a mostly topographically flat, featureless landscape having strong hydrological connectivity. The climate is harsh, with long, cold winters and fairly dry, cool summers. Water is at a premium and species diversity is low. Community succession is largely driven by disturbance, especially wildfire; however, in recent decades anthropogenic disturbances have become increasingly prevalent. Disturbances related to resource development such as forestry practices, reservoir creation, peat harvesting, and oil and gas production most recently from bitumen extraction from oil sands are especially frequent. Both open-pit and SAGD operations produce either large scale or frequent disturbances and the science of reclaiming these areas is still in its infancy.

This book is composed of chapters that reveal our current state of knowledge on reclamation and restoration of these boreal ecosystems. The chapters in this book were selected from presentations, discussions, and posters that were presented during a three-day symposium held at the Matrix Hotel in Edmonton, Alberta on March 25–27, 2010. This symposium, *Reclamation and Restoration of Boreal Peatland and Forest Ecosystems: Toward a Sustainable Future*, addressed problems and recent research being carried out in North America on the topic.

The chapters in this book emphasize the use of natural regimes as models for reclamation and present the resulting challenges of reclaiming boreal ecosystems. In addition, the importance of the boreal forest as a carbon store has implications for global climate and several chapters focus on this global concern.

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