

Summary of:

Effects of Disturbances on Plant Diversity in the Southern Boreal Forest; Redmann, Dr. R. E.; 1995; Prince Albert Model Forest Assoc. Inc., Prince Albert, Saskatchewan. 18 p.

ABSTRACT

(1) Rationale Changes in forest composition during succession after fire or clearcutting, and especially shifts in plant species diversity, are not well-documented in the mixedwood section of Saskatchewan boreal forest. Structural differences between forest ecosystems which develop after clearcutting versus fire also have not been described. Understanding the processes controlling species diversity at all stages of stand development is a basic requirement for management of diversity in the landscape. The extent to which current forest harvesting practices differ from natural disturbance by fire, leading to different successional pathways, stand composition and stand structure, is unclear. Plant diversity varies along topographic gradients associated with drainage systems (riparian forest).

(2) Objectives The main objectives of this research are: (a) to compare the temporal patterns of plant species diversity (including rare plants) after clearcutting and burning in mixedwood stands in the Prince Albert Model Forest region, and (b) to determine how diversity changes along topographic gradients near drainage systems, and in the larger-scale landscape.

(3) Methods Sites used in successional studies (chronosequence) were selected based on tree composition and age ranging from 0 to 180+ years after disturbance. Stands were selected on six major rivers to examine effects of topographic gradients on forest composition. Mosses, lichens, herbs, shrubs and trees were sampled using standard techniques. Structural characteristics, such as amount and stage of decomposition of woody debris, were measured. Environmental parameters including soil properties and light levels were recorded for all stands.

(4) Results- Chronosequence Study: As of May 1996, 42 stands have been sampled. All field data have been tabulated, checked and entered in the computer. Calculations of understory plant species (alpha) diversity have been completed, including species richness and the Shannon-Wiener index. Richness values ranged from 10 to over 50 species per plot, with a total of over 200 species of higher plants sampled. Stand ages range from 0 to over 180 years and have originated from clearcutting and burning. The evenness component of plant species diversity was calculated using Shannon's index and plotted according to age and origin of the stand. A TWINSpan classification of the clearcut plots was completed. Landscape (beta) diversity is being analyzed using this data set. Toposequence Study: This aspect of the overall project has been completed, the final report was submitted in May 1996.