

## ENHANCED FOREST PRODUCTIVITY SCIENCE PROGRAM

### LIST OF PROJECTS COMPLETED IN 2008/09

#### PROJECT NUMBER: EFPS 054-2-R1

**Title** Adjustments to Seed Source Selections and Breeding Zones to Compensate for Predicted Climate Change in Ontario

**Applicant:** Faculty of Forestry and the Forest Environment, Lakehead University

**Funding:** \$61,000

**Duration:** 2 Years

**Description:** The goals of this study are to develop the first decision support model capable of providing decision makers with a mixture of seed sources that minimizes risk of maladaptation at a given site under all probable climate change scenarios; and, to apply this model to evaluating the advisability of including some elite trees taken from outside current breeding zone boundaries into 2nd and 3rd generation breeding programs based on predicted climate change considerations.

#### PROJECT NUMBER: EFPS 076-2-R2

**Title** Striking A Balance: Enhancing Forest Productivity to Meet Future Wood Supply and Bioenergy Objectives While Sustaining Ontario's Boreal Forest Ecosystems

**Applicant:** Forest Ecosystem Science Co-operative Inc.

**Funding:** \$211,400

**Duration:** 3 Years

**Description:** Striking a balance for sustainable forest management builds on the best available science from forestry and forest ecology disciplines to enhance forest productivity and conserve forest ecosystem structure and function. Natural origin stands approaching the onset of old growth are being compared with new stands established through extensive, basic, intensive and elite levels of silviculture for response to two questions 1) "How much fibre can be gained through integration of silvicultural treatments? 2) Will floral species be lost despite our best efforts to retain tree species and structural diversity?"

#### PROJECT NUMBER: EFPS 078-2-R2

**Title:** Characterizing marten natal den sites in managed forests.

**Applicant:** Northeast Science & Information Section, MNR

**Funding:** \$25,000

**Duration:** 1 Year

**Description:** Martens preferentially use older forest stands with significant conifer composition, large trees and complex structural conditions near the ground. These stands are also important to the industrial wood supply. The study will investigate whether there are more suitable marten den sites in older forests or forests that have the structural characteristics of older forests, than in forest stands without these characteristics. This study will attempt to determine the critical structural characteristics of marten natal and maternal den sites and the stands within which they are located.

#### PROJECT NUMBER: EFPS 083-2-R2

**Title:** 15-Year Growth and Yield from Ontario Critical Period of Vegetative Competition Study

**Applicant:** Forestry Research Partnership

**Funding:** \$29,500

**Duration:** 2 Years

**Description:** A critical period (CP) study was established outside Sault Ste. Marie, Ontario in 1992 to define the optimum timing and duration of vegetation control for jack pine, red pine, white pine, and black spruce plantations. As the study will be completing its 15th year in 2006, it is vital that tree growth and survival be measured to provide data for improving growth and yield models, the interaction of vegetation management and soil productivity, and to determine whether the CP determined during the early years of stand development is maintained over time. This project will measure, analyze, and report the 15th-year results from the Ontario CP study.

**PROJECT NUMBER: EFPS 086-2-R2**

**Title:** Development and Implementation of Succession Model (Modeling Ontario's Stand Succession and Yield (MOSSY)) in Ontario

**Applicant:** Forest Ecosystem Science Co-operative Inc.

**Funding:** \$60,000

**Duration:** 3 Years

**Description:** MOSSY is a user-friendly empirical model (decision support tool) that provides forest managers with defensible estimates of forest succession and yield, while also providing a software shell for the new and provincially approved benchmark yield curves. The goal of MOSSY is to provide yield and estimates of natural succession based on the re-measured Provincial growth and yield permanent sample plot dataset, and compatible with current forest management planning procedures and tools.

**PROJECT NUMBER: EFPS 087-2-R2**

**Title:** The Use of LSP with Satellite or Aerial Super High Resolution Imagery to Project and Track Stand Development

**Applicant:** Forest Ecosystem Science Co-operative Inc.

**Funding:** \$112,000

**Duration:** 2 Years

**Description:** This project will test the utility of using Large Scale Photography (LSP), with high resolution imagery & ITC techniques to determine future yields based on values derived from the analysis of managed forest stands and density management diagrams. The LSP & ITC techniques should also identify the species composition of the block to aid in planning competition control.

## ENHANCED FOREST PRODUCTIVITY SCIENCE PROGRAM

### LIST OF PROJECTS COMPLETED IN 2007/08

#### PROJECT NUMBER: EFPS 003-1-R1

**Title:** Forest Co-op Growth & Yield Permanent Growth plot program  
**Applicant:** Forest Ecosystem Science Co-operative Inc.  
**Funding:** \$576,000  
**Duration:** 3 Years  
**Description:** This project will provide the quality of information required to accurately predict wood supply projections within forest management planning. The project is to provide improved estimates of tree and stand growth for both natural and artificially regenerated forest types over a wide range of site conditions under a variety of management intensities. The estimates will be used in forest management planning to determine wood supply. The data will be used to develop additional tools to aid in forest resource management.

#### PROJECT NUMBER: EFPS 010-2-R1

**Title:** Environmental Impacts of Partial Harvesting in Riparian Reserves of Ontario's Mixedwood Forests: Post-Logging Assessment Phase  
**Applicant:** Great Lakes Forestry Centre, Canadian Forest Service  
**Funding:** \$206,000  
**Duration:** 3 Years  
**Description:** The overall goal of the project is to determine whether partial harvesting can be conducted within riparian AOCs of boreal forest streams in a way that is compatible with the environmental protection objectives of provincial guidelines. The project plan included the establishment of six research sites in low-order watersheds, collection of baseline data to characterize the sites, habitat and biotic communities, conventional clear-cutting in upland areas and partial harvesting in riparian reserves of three of the sites (the other three serve as reference sites), and post-logging assessment of response variables.

#### PROJECT NUMBER: EFPS 012-2-R1

**Title:** Extension Project - Forestry Research Partnership  
**Applicant:** Forest Research Partnership  
**Funding:** \$196,000  
**Duration:** 3 Years  
**Description:** The Partnership's Extension Program is the critical component for the delivery of relevant forest science to all levels within various organizations, from the boardroom to field/operational level. The project both leads and supports initiatives to transfer new and existing knowledge relating to Enhanced Forest Productivity to forest management practitioners and policy makers, and to actively involve them in its implementation.

#### PROJECT NUMBER: EFPS 014-2-R1

**Title:** Logging Damage Impacts  
**Applicant:** Forest Research Partnership

**Funding:** \$96,000  
**Duration:** 3 Years  
**Description:** Recent second entries into tolerant hardwood stands have identified that expected basal area growth rates were less than was expected or modeled in our strategic wood supply models ensuring our levels of sustainability. The reduction in growth rate has been attributed to many potential factors including logging and site damage. The project will examine the issue of skid trail impacts on the growth of the residual hardwood and pine forest and will provide new science that will be used to adjust silvicultural practices

**PROJECT NUMBER: EFPS 016-2-R1**

**Title:** Regenerating Boreal Mixedwoods: Effects of Herbaceous Vegetation Control and Aspen Stem Density on Stand Development  
**Applicant:** Forest Research Partnership  
**Funding:** \$96,000  
**Duration:** 3 Years  
**Description:** A lack of mixedwood regeneration strategies, coupled with impending wood supply shortfalls for both aspen and spruce identified in Ontario's Provincial Wood Supply Strategy has sparked serious land-use conflicts in the northeast and northwest regions of Ontario and elsewhere. The project's focus is on obtaining better information on the regeneration, management, tending, and protection of boreal mixedwoods.

**PROJECT NUMBER: EFPS 017-2-R1**

**Title:** Parkside Gully Tolerant Hardwood Selection Harvesting and Product Recovery Study  
**Applicant:** Forest Research Partnership  
**Funding:** \$20,000  
**Duration:** 3 Years  
**Description:** The Parkside Gully Tolerant Hardwood Selection Harvesting and Product Recovery Study is one of the longest running and largest size controlled harvest hardwood studies known in Ontario. This project will re-measure all permanent sample plots (treated and control) associated with this study, carry out the next scheduled operational harvest of the study stands, and complete a full product recovery study to relate the final wood products (boards, veneer, pulp, bolts) and their values in relation to the different preharvest log grades present on the sites.

**PROJECT NUMBER: EFPS 018-2-R1**

**Title:** Spatial Planning for Sustainable Forest Management  
**Applicant:** Forest Research Partnership  
**Funding:** \$157,000  
**Duration:** 3 Years  
**Description:** The main objective of the project is to improve sustainable forest management modeling and decision support capabilities using Patchworks and other related models. A second objective is to develop linkages between Patchworks and other models that are capable of modeling risk and uncertainty. This will provide forest managers with a spatially explicit decision support system that enables them to incorporate risk into their planning process.

**PROJECT NUMBER: EFPS 020-2-R1**

**Title:** Effects of Early Herbaceous and Woody Vegetation control on Eastern White Pine Regeneration

**Applicant:** Forest Research Partnership

**Funding:** \$50,000

**Duration:** 3 Years

**Description:** This study's aim is to identify the vegetation components that most compete with white pine and the time during seedling development when competition is greatest, so that foresters may better target and time vegetation management efforts for the greatest success. Project outcomes will also address and provide further information on the potential for efficient herbicide use and lower risk integrated pest management strategies, where competition control to improve early establishment of this species is critical.

**PROJECT NUMBER: EFPS 021-2-R1**

**Title:** Yield Curve Refinement - Northeastern and Southern Ontario

**Applicant:** Forest Research Partnership

**Funding:** \$42,000

**Duration:** 3 Years

**Description:** This project uses the full sample plot network to develop yield curves that reflect different levels of management intensities. The validation of the curves against an independent data set is an important part of model development and refinement. The objective of this project is to validate the yield curves against independent data and publish the results.

**PROJECT NUMBER: EFPS 028-2-R1**

**Title:** Developing and Evaluating Stem Profile Models for Plantation Grown Jack Pine and Black Spruce Trees at Varying Stand Density

**Applicant:** Ontario Forest Research Institute, MNR

**Funding:** \$244,000

**Duration:** 3 Years

**Description:** Development of taper equations is a basic prerequisite to estimating individual tree volumes and product yields. The objectives of this study are to develop new and more appropriate taper functions for these species; evaluate the long-term density effects on tree form which arise from different planting density (or by mortality) and by thinning., and determine the most appropriate sampling design in terms of the sample size and selection procedures which minimize prediction error when building taper equations.

**PROJECT NUMBER: EFPS 029-2-R1**

**Title:** Development of Habitat Element Curves using Processed-Based Modeling

**Applicant:** Centre for Northern Forest Ecosystem Research, MNR

**Funding:** \$42,000

**Duration:** 2 Years

**Description:** Using a process-based stand development model this project will develop “yield” curves for critical stand-level habitat elements. Using habitat occupancy models already developed the project will demonstrate application of the habitat element curves by predicting future probabilities of habitat occupancy for selected species in the Nipigon and Gordon Cosens Forest Management Units.

**PROJECT NUMBER: EFPS 044-2-R1**

**Title:** Completion of the Northern Ontario Plant Database

**Applicant:** Upper Lakes Environmental Research Network

**Funding:** \$83,000

**Duration:** 2 Years

**Description:** This project is to complete the data entry phase of the Northern Ontario Plant Database (NOPD) and to accomplish additional goals aimed at improving the usefulness of the NOPD to the forestry community.

**PROJECT NUMBER: EFPS 053-2-R1**

**Title:** Aboriginal expectations of sustainable forest management and the perceived effectiveness of Ontario forest practices and forest certification

**Applicant:** National Aboriginal Forestry Association

**Funding:** \$136,000

**Duration:** 2 Years

**Description:** The purpose of this project is to explore the extent to which forest management practices in Ontario meet the expectations that Aboriginal peoples have of the way Crown forest lands within their traditional territories should be managed. The main outcome of the project will be an increased capacity to address Aboriginal dimensions of sustainable forest management.

**PROJECT NUMBER: EFPS 057-2-R1**

**Title:** Effect of Partial Harvesting and a Forest Tent Caterpillar Outbreak on Stand Development of a Boreal Mixedwood Stand

**Applicant:** Northeast Science and Information Section, MNR

**Funding:** \$32,000

**Duration:** 1 Year

**Description:** A partial harvest trial of a boreal mixedwood stand was initiated in 1995 on the Lake Abitibi Model Forest. A subsequent tent caterpillar outbreak accelerated the natural mortality of a large portion of the overstory trembling aspen. This combination of events presented a unique opportunity to quantify and compare the effects of partial harvested and unharvested stands when a natural disturbance (insect defoliation) is superimposed on the treatments tested, accelerating natural stand break-up.

**PROJECT NUMBER: EFPS 060-2-R1**

**Title:** Evaluating the Effects of Post-Harvest Silvicultural and Intensive Forest Management Practices on Boreal Landbirds

**Applicant:** Bird Studies Canada

**Funding:** \$104,000

**Duration:** 2 Years

**Description:** This research will evaluate how closely post-harvest silvicultural practices, including intensive forest management practices, emulate natural disturbance processes, such as fire, from the perspective of boreal landbirds. The research will provide a framework for ongoing future habitat and monitoring by developing remote-sensing protocols (validated by field data).

**PROJECT NUMBER: EFPS 067-2-R1**

**Title:** Developing Sustainable Boreal Mixedwood Practices in a Stand Level Adaptive Management (SLAM) Framework

**Applicant:** Ontario Forest Research Institute, MNR

**Funding:** \$209,000

**Duration:** 3 Years

**Description:** The project's goal is to advance knowledge on mixedwood management by testing innovative techniques for achieving productive mixtures of conifers and hardwoods at operational scales, and monitoring associated changes in ecological indicators. An active adaptive management framework is being used in the project to speed learning and ensure incorporation of results into practice

**PROJECT NUMBER: EFPS 079-2-R2**

**Title:** Impact of Prescribed Burning on Growth and Dynamics of Forest stands

**Applicant:** Forest Ecosystem Science Co-operative Inc.

**Funding:** \$150,000

**Duration:** 2 Years

**Description:** This project will investigate the effects of prescribed burns and basic silviculture (site prep, plant, tend) on forest growth and yield, stand dynamics and early stand floristics as compared to natural fire. A series of 'matched' plots will be established in 14 to 35 year old plantations and natural sites with 3 broadly contrasting disturbance histories: wildfire, prescribed burn, and mechanical site preparation.