

ENHANCED FOREST PRODUCTIVITY SCIENCE (EFPS) PROGRAM

ONGOING PROJECTS

PROJECT NUMBER: EFPS 002-1-R1

Title Assessment of Jack Pine Budworm Impacts in Ontario Forests for the Development and Implementation of a Decision Support System

Applicant: BioForest Technologies Inc.

Funding: \$318,000

Duration: 3 Years

Description: Research has unequivocally shown that insects and diseases cause significant losses to the forest resource annually. In Ontario, losses to insects in 1998-1999 totaled some 18.5 M m³. There appears to be an opportunity to significantly enhance wood volumes available to forest industry if losses to insects and diseases can be reduced in an environmentally sensitive and economically rational manner. This project will assess jack pine budworm impacts on jack pine and develop a Jack Pine Budworm Decision Support System.

PROJECT NUMBER: EFPS 008-1-R1

Title Acquiring and testing Multiband orthophotography (and integrated LIDAR) for production of enhanced forest inventories in the Great Lakes St. Lawrence Forest

Applicant: Forest Research Partnership

Funding: \$532,000

Duration: 3 Years

Description: Multi-return LiDAR (Light Detection and Ranging) offers an opportunity to capture dense point data defining the first surface (canopy) and penetration into the vegetation cover with many points also hitting the forest floor. This project will: focus on forest cover types of the Great Lakes St. Lawrence Forest Region; will attempt to develop methods of enhanced inventory estimation for individual trees characteristics (as well as stand level attributes); will explore applications of wetland mapping and stream identification

PROJECT NUMBER: EFPS 009-1-R1

Title Second-Generation Breeding and Testing for Jack Pine and Black Spruce

Applicant: Forest Genetics Ontario

Funding: \$320,000

Duration: 3 Years

Description: This project seeks to complete the research component of second generation tree improvement programs in three breeding zones in northwestern and four breeding zones in northeastern Ontario. The project will complete the breeding and testing components in seven second-generation tree improvement programs.

PROJECT NUMBER: EFPS 032-2-R1

Title A large-scale experimental and longitudinal investigation of the impact of selection harvest regimes on sustainable forest management

Applicant: Biology Department, Trent University

Funding: \$113,000

Duration: 3 Years

Description: This study will provide Ontario-based data to improve provincial silviculture guides and allow for adaptive fine-tuning of strategies for regenerating mid-tolerant and tolerant tree species. The results will also provide recommendations for maintaining or improving the breeding habitat of some of Canada's most sensitive forest bird species within both fragmented and continuous forest systems.

PROJECT NUMBER: EFPS 035-2-R1

Title Multi-Cohort Forest Management in North-Eastern Ontario: Cohort Classification, Associated Wildlife Communities, and Projected Stand Dynamics

Applicant: Faculty of Forestry, University of Toronto

Funding: \$305,000

Duration: 3 Years

Description:

Multi-cohort Forest Management (MFM) offers a strategy for balancing goals by applying silvicultural techniques that emulate natural structural variability within boreal stands, from relatively young stands consisting of a single cohort of trees to the oldest stands in which multiple cohorts of trees may be represented. Specific objectives are to develop a forest-type-specific system of cohort classification that uses plot-based measurements of stand structure; to use enhanced forest inventory information (EFI) to test the applicability of the plot-based system to the stand and management unit levels; to use plot data and EFI to examine multi-scale relationships between cohort type and wildlife communities, focusing on small mammals, birds, and selected insect taxa; and to use an individual-based model of stand dynamics to project fibre and wildlife values under different MFM silvicultural scenarios.

PROJECT NUMBER: EFPS 039-2-R1

Title Forest management in riparian areas: ensuring the protection of biodiversity, ecosystem values while maximizing timber production - stand-level to landscape-level analysis

Applicant: Department of Biology, Lakehead University and Centre for Northern Forest Ecosystem Research, MNR

Funding: \$200,000

Duration: 3 Years

Description: This research shall address four broad questions regarding riparian management: What are the physical and biological responses of small stream riparian zones to various levels of disturbance?; How do the various levels of shoreline disturbance influence the ecological characteristics of small stream systems?; What are the watershed scale impacts of natural disturbance versus the different forest management scenarios?; and, What are the economic and ecological tradeoffs under different riparian zone management scenarios?

PROJECT NUMBER: EFPS 048-2-R1

Title Expanding the Application of the Canadian Carbon Budget Model to Forest Management Planning in Ontario's Boreal Forest

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

Funding: \$60,000

Duration: 3 Years

Description: This project will provide essential scientific information and tools that will contribute to sustainable forest management under the new operating paradigm that includes climate change, carbon (C) accounting and intensive silviculture. The research project will allow the team to strengthen the network of collaborators; link critical soil parameters to forest ecosystem characteristics and management scenarios; calibrate ecosystem and C budget models for specific stand types that will allow forest policy makers to evaluate the long-term consequences of different management activities; and, support the maintenance and training of high quality personnel through the research and graduate studies capacities of Lakehead University.

PROJECT NUMBER: EFPS 049-2-R1

Title Ivy: a Robust and Versatile Stand Dynamics Model
Applicant: Great Lakes Forestry Centre, Canadian Forest Service
Funding: \$94,000
Duration: 3 Years
Description: This project uses a light-capture based modeling approach to provide more robust, long-term forecasts of stand structure, composition, growth and yield. A light-capture based modeling approach is more straightforward and is more closely related to tree growth processes than empirical models. The goal of this project is to complete a light-capture based stand dynamics model, IVY, and to implement a practical software interface for this model. The name IVY is derived from the abbreviation of volume increment, iV, and emphasizes that the model estimates the volume increment of individual trees.

PROJECT NUMBER: EFPS 055-2-R1

Title Ace Effects of Vegetation Management Alternatives
Applicant: Faculty of Forestry and the Forest Environment, Lakehead University
Funding: \$159,000
Duration: 3 Years
Description: The goal of this project is to synthesize data and results from existing studies and monitoring efforts. The specific objectives of this project are five-fold: Develop a first generation competition index model for jack pine, black spruce, white spruce and white pine using available data; Contrast conifer gains against hardwood losses for multiple vegetation management treatments; Provide a scientifically defensible comparison of the effectiveness of multiple vegetation management treatments relative to aerially applied herbicides based on 10th-year post -treatment data; Determine longer-term (> 10 year) impacts of forest vegetation management practices on biodiversity; Synthesize results of the studies and transfer to practitioners.

PROJECT NUMBER: EFPS 056-2-R1

Title Evaluation and improvement of free-to-grow assessment methods and standards through operational integration of field and remotely sensed procedures
Applicant: KBM Forestry Consultants Inc.
Funding: \$86,000
Duration: 2 Years
Description: The project will focus on the development of more cost-effective, quantifiable, and re-measurable free-to-grow (FTG) inventory methodologies coupled with an effective implementation strategy at both the policy level and utilization by both OMNR and industry forest management teams. The project will evaluate the accuracy, results and

cost effectiveness of large-scale photography for FTG assessments by comparing results to various ground survey methods.

PROJECT NUMBER: EFPS 074-2-R2

Title: Modeling Diameter Distribution and Stand Value for Three Types of Jack Pine Stands in Ontario
Applicant: Forintek Canada Corp.
Funding: \$218,000
Duration: 3 Years
Description: This project will not only provide the missing growth and yield information on jack pine stands, but also establish a direct link between FRIs and product recovery. The ability to predict stand-level product recovery from the FRIs and as a result of stand management will lead to better estimates of wood supply, and better-informed silvicultural, harvesting and end-use decisions.

PROJECT NUMBER: EFPS 075-2-R2

Title: Silvicultural and Ecological Productivity of Black Spruce / Jack Pine Mixedwoods
Applicant: Centre for Northern Forest Ecosystem Research, MNR
Funding: \$74,000
Duration: 3 Years
Description: This project will review existing literature on conifer mixedwood productivity, test the hypothesis that mixedwoods are more productive than single species stands in the context of black spruce (Sb) and jack pine (Pj), and develop at least one crop plan designed to manage for both species on the same site. Mixed and single species stands that are currently at the self-thinning phase of stand development will be examined to assess their potential for increased productivity through mixedwood management.

PROJECT NUMBER: EFPS 077-2-R2

Title: Regeneration of paludified forests after different forest harvest and site preparation techniques
Applicant: Chaire industrielle CRSNG-UQAT-UQAM en aménagement forestier durable, Université du Québec en Abitibi-Témiscamingue
Funding: \$16,611 (Year 1 funding), \$110,250 (Years 2 and 3)
Duration: 3 Years
Description: This study proposes to look at the consequences of these harvesting techniques by comparing them to old harvest sites that were harvested by clear cuts (where the soil organic layer was greatly disturbed) and prescribed burns (that are closer to the natural disturbance pattern) that were carried out in the 1970s and 1980s. Measures of tree stocking, growth and foliar nutrition, along with site condition variables will determine whether stands that are created by current techniques, result in inferior, similar or superior tree establishment and growth when compared to previous techniques that disturbed more severely the surface soil.

PROJECT NUMBER: EFPS 080-2-R2

Title: Maximizing the Value of Black Spruce Resource through Development of an Integrated IFM Strategy
Applicant: Forintek Canada Corp.
Funding: \$164,000

Duration: 3 Years

Description: Each cubic meter of wood is not created equally in terms of product recovery (yield, quality, mix, value). Therefore, forest managers should not simply strive to maximize wood fiber production which could be at the expense of the quality and value of the end-products. The three-year project to be completed in 3 phases and will evaluate the impact of three major IFM practices (pre-commercial thinning, commercial thinning and stand age-class or harvest age) on the entire wood value chain in black spruce.

PROJECT NUMBER: EFPS 081-2-R2

Title: Implementation of Enhanced Forest Productivity: A Pilot Project on the Romeo Malette Forest

Applicant: Forestry Research Partnership

Funding: \$157,150

Duration: 3 Years

Description: The Forestry Research Partnership (FRP) has been involved with more than 120 research projects aimed at enhanced forest productivity and sustainability. As a means of operationally validating these new FRP products and catalyzing wider application of enhanced forest productivity, the FRP proposes to establish a series of demonstration areas encompassing approximately 1000 ha on the Romeo Malette Forest. On these areas, state-of-the-art knowledge and tools will be integrated as harvest-to-harvest sequences of silvicultural best-practices, aimed at maximizing forest productivity.

PROJECT NUMBER: EFPS 082-2-R2

Title: Commercial Thinning in Black Spruce Plantations

Applicant: Centre for Northern Forest Ecosystem Research, MNR

Funding: \$198,290

Duration: 3 Years

Description: The objective of this project is to provide an integrated quantitative analysis of the silvicultural, ecological and economic effects of several CT regimes in boreal black spruce plantations. This project will examine responses in terms of resource supply (light, nutrients, moisture), tree growth and stand productivity (physiological response and growth allocation), understory plant dynamics (composition, structure and diversity), operational costs, and wood quality and value. The treatments established through this project will provide a valuable research tool for the examination of stand level responses for the next 20+ years.

PROJECT NUMBER: EFPS 084-2-R2

Title: Enhanced Forest Management of Red Oak and White Pine in Shelterwood Silvicultural

Applicant: Department of Biology, Nipissing University

Funding: \$120,000

Duration: 3 Years

Description: The objective of this project is to examine the application of intensive forest management practices for red oak, and explore how similarities in the ecology and management of red oak and white pine can be incorporated into strategies for enhancing the productivity of stands that contain both of these species. The study will also contribute to data collection for studies that have been initiated and require long-term monitoring approaches.

PROJECT NUMBER: EFPS 085-2-R2

Title: Reducing Uncertainty of Wood Supply through Better Understanding of Recreation Use:
An Application of the Spatial Recreation Planning Framework

Applicant: Centre for Parks, Recreation and Tourism Research, Lakehead University

Funding: \$177,000

Duration: 3 Years

Description: The proposed research project will explore the integration of recreation, tourism, and commercial forest operations in order to reduce conflict, costs of operations, and provide enhanced certainty in wood supply. The objectives of the study include: To test the transferability of the Spatial Recreation Planning Framework into a new geography that contains general use (including tourism and recreation) and enhanced management areas; To explore the potential of the Spatial Recreation Plan to act as a forecasting tool to identify special recreation places; To gain a better understanding of key criteria that exist within already identified special recreation places; and, to identify the seasonal importance of special recreation places.