



Fundy Model Forest

~Partners in Sustainability~

Report Title: Tree Island: Leave Patches as Refugia for Plants and Bryophytes in Harvest Blocks

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Year of project: 2006

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***The Fundy Model Forest...
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“The Fundy Model Forest (FMF) is a partnership of 38 organizations that are promoting sustainable forest management practices in the Acadian Forest region.”

Atlantic Society of Fish and Wildlife Biologists
Canadian Institute of Forestry
Canadian Forest Service
City of Moncton
Conservation Council of New Brunswick
Fisheries and Oceans Canada
Indian and Northern Affairs Canada
Eel Ground First Nation
Elgin Eco Association
Elmhurst Outdoors
Environment Canada
Fawcett Lumber Company
Fundy Environmental Action Group
Fundy National Park
Greater Fundy Ecosystem Research Group
INFOR, Inc.
J.D. Irving, Limited
KC Irving Chair for Sustainable Development
Maritime College of Forest Technology
NB Department of the Environment and Local Government
NB Department of Natural Resources
NB Federation of Naturalists
New Brunswick Federation of Woodlot Owners
NB Premier's Round Table on the Environment & Economy
New Brunswick School District 2
New Brunswick School District 6
Nova Forest Alliance
Petitcodiac Sportsman's Club
Red Bank First Nation
Remsoft Inc.
Southern New Brunswick Wood Cooperative Limited
Sussex and District Chamber of Commerce
Sussex Fish and Game Association
Town of Sussex
Université de Moncton
University of NB, Fredericton - Faculty of Forestry
University of NB - Saint John Campus
Village of Petitcodiac
Washademoak Environmentalists



Fundy Model Forest Interim Report
September 2006

Project Title:

Tree islands: Leave patches as refugia for plants and bryophytes in harvest blocks

Proponent Name and Affiliation:

Dr. Kate Frego, Univ. of New Brunswick – Saint John

Dr. Mark Roberts, Univ. of New Brunswick - Fredericton

Partners and Affiliations:

J D Irving, Ltd.

Village of Petitcodiac

Brief Description of Project and Objectives (1 paragraph):

Project Description

Concern about ground-layer plant responses to forest management in Acadian Forests has prompted suggestions that remnant canopy could be used to preserve pre-harvest plant communities. With the support of JD Irving, Ltd, this project was designed to test the effectiveness of tree islands (also known as leave patches) at capturing and maintaining ground-layer plant populations that are found to be sensitive to forest harvest, which will ultimately enable us to test the ability of tree islands to facilitate the recolonization of sensitive species into the surrounding cutblock. From 2002-2006, four experimental islands were established and sampled before harvesting the surrounding cutblock and each of 3 years after the harvest of the surrounding cutblock. To assess changes in the communities, two control islands were also established and sampled in 2005 and 2006 in areas that were not harvested. In each of these 6 islands, belts of 5 plots at different distances from an island edge were placed along 4 transects, for a total of 110 plots. These permanent plots were located inside and outside islands and were resampled annually.

Project Objectives

1. To determine the extent to which species inside islands are able to persist in the 3 years following harvest, relative to natural community changes within control islands. This objective will address the practical questions: How large do islands have to be in order to escape inhospitable edge effects that penetrate into islands? Do tree islands act as “lifeboats” for the ground-layer plant species that are sensitive to forest harvest? (and if so, for how long?)
2. To determine whether clear-cuts surrounding tree islands more closely approximate their pre-harvest community composition in the years following harvest than clear-cuts without tree islands (such as the Hayward Brook plots). This objective, along with objective 1 will address the practical questions: Do islands conserve biodiversity? Does community re-establishment in clear-cuts increase with the presence of tree islands, and for what species?

Progress to date and any potential changes to the timeline (a few paragraphs):

Ground-layer vegetation sampling was completed in August 2006 at the 2 experimental islands that were slated to be sampled this year. When compiled with data from previous years, we now have data for 1 year pre-harvest as well as 1, 2, and 3 years post-harvest at 4 experimental islands. This gives us 4 years data x 4 control islands x 110 plots per island, for a total of 1760 plot-years of data. Ground-layer vegetation sampling was also completed in August 2006 at the 2 control islands. Together with last year's control island data, we now have 2 years data x 2 control islands x 110 plots per island for a total of 440 plot-years of data. Canopy cover measurements and quantification of substrates available for colonization was completed for each plot that was sampled. Identification of unknown specimens collected in 2006 and data analysis is underway.

In 2006, additional permanent plots were placed in each of the six islands near the edges of the islands to examine edge effects more closely. Although this part of the 2006 field work was not included in the project proposal, it is an important addition to the design of the project. These additional plots will clarify the roles of compass direction in the penetration of edge effects, and allow for a more detailed analysis of these effects.

Quantification of blowdown within islands in 2006 will be completed in September. At this time, the perimeter of each experimental island will also be measured to check for island shrinkage by comparing to the perimeter measurements for previous years. Dataloggers measuring microclimatic conditions (temperature, relative humidity, and photosynthetic active radiation) within and outside islands are still collecting data. This equipment and data will be retrieved in November for data compilation and analysis.

Budget and explanation of any expected changes:

Personnel:

Student salaries (2 MSc.)	\$42,000
Field/lab assistants (2 x \$5250)	\$10,500
Bryophyte identification	\$ 2,500
Travel to field site (1 trip/wk x 16 wks)	\$ 3,000
Accommodation/food (4 mos x 4 students)	\$ 1,600
Data logger probes, calibration, repairs	\$ 2,600
Materials (wooden stakes, rebar markers, paint, etc.)	\$ 800
Total	\$ 63,000

List of leveraged cash and in-kind support (list sources and amounts separately):

NSERC- IPS – J. Mudge & M. de Graaf	\$42,000
UNB graduate support	
SCP (2 bryo, 1 vasc)	\$ 6,000

In kind:

UNB PI salaries	\$ 34,000
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UNB Lab and equipment	\$ 28,000
Village of Petiscodiac	\$ 2,000
Total	\$ 64,000