

FOREST RESEARCH REPORT



Nova Scotia Department of Natural Resources
Forest Management Planning

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Report FOR 2013-1 No. 95

Drafted – March 6, 2013

Pre-Treatment Assessments Requirements (PTA) Under the Nova Scotia Code of Forest Practices

Tim McGrath

Background

In 2011, the government of Nova Scotia announced a new natural resources strategy after comprehensive citizen, stakeholder and technical expert engagement (1). This strategy calls for “Apply(ing) the Code of Forest Practice on publicly and privately owned woodlands” as one of its important elements (2).

The **Code of Forest Practice** consists of three elements;

- The Framework Document that outlines the general principles of the code,
- Guidebooks that lists more detailed guidelines concerning our forests, and
- Technical Manuals that show details on implementing the guidelines.

Some examples of technical manuals are:

- Forest Ecosystem Classification (FEC) for Nova Scotia (3)
- Tolerant Hardwood Management Guide (4)
- Tolerant Softwood & Mixedwood Management Guide(5)

Pre-Treatment Assessments

One of the key guidelines of the Code of Forest Practice (COFP) concerns Pre-treatment Assessments and states:

1.2.2 The provincial FEC, an extension of the ELC, will be the stand level operational guide for applying ecosystem-based management.

1.2.3 Areas planned for silviculture treatments, including timber harvest, will have a pre treatment assessment (PTA) prepared that describes site, and forest conditions.

1.2.3.1 The PTA will serve as a basis for stand level management plans.

1.2.3.2 Stand level management plans will be compatible with the eco district plan

As is stated in these guidelines, a PTA that includes FEC and forest condition information is a required element in implementing ecosystem-based management (EBM). Before a silviculture operation is carried out, stand-level details on the site such as vegetation type, soils type, ecosite and windthrow hazard along with stand characteristics such as basal area, species, tree diameter, height, potential quality and existing regeneration must be collected. Information on special wildlife and geological features is also required. This information will enable prescribing appropriate treatments, specific to stand attributes and avoid a “one-size fits all” system of forest management.

To help meet the objectives of COFP Guideline 1.2.3, a system was developed to identify the required elements of pre-treatment assessment (PTA). This PTA system was first published as part of the Tolerant Management Guides (4)(5) to gather the information necessary to prescribe appropriate silviculture treatments for specific ecosystems and stand conditions. This report extracts this methodology into a separate document in order to define PTA requirements silviculture and harvest programs. It is required on crown lands and is being encouraged on private lands.

Although detailed data collection and summary methods are described here, alternative collection methods are allowed as long as the required information is collected, summarized and used to prescribe ecosystem and stand condition specific prescriptions.

Paper tally sheet and computer data collection methods are described as options. These tools are available from the Department of Natural Resources.

A sample PTA summary sheet is also shown, it illustrates the minimum required ecosystem, mensuration, biological and geological information necessary for prescribing ecosystem based management prescriptions.

The information shown can be used to prescribe treatments by using the Tolerant Hardwood or Tolerant Softwood/Mixedwood Management Guides for the vegetation types included in these guides. Guides covering other major FEC vegetation groups are in development. If alternative treatments to those prescribed in the guides are recommended by the cruiser, written justification must be included in the PTA.

Pre-Treatment Assessment (PTA) Methods

Cruising Instructions

Take 1 prism point every hectare with a minimum of 5 prism points and a maximum of 25 per stand.

- Use a BAF 2 prism.
- Evenly distribute these points throughout the stand.
- A PTA summary will include the following information.
 - Location
 - Stand ID
 - Number of sample plots
 - Area of stand
 - FEC vegetation type [Forest Ecosystem Classification | novascotia.ca](http://www.gov.ns.ca/natr/library/forestry/reports/Soil-Types.pdf)
 - FEC soil <http://www.gov.ns.ca/natr/library/forestry/reports/Soil-Types.pdf>
 - Wind exposure, <http://www.gov.ns.ca/natr/library/forestry/reports/Soil-Types.pdf>
 - Windthrow hazard
<http://www.gov.ns.ca/natr/library/forestry/reports/REPORT91.pdf>
 - Total Basal Area
 - Basal Area of **A**ccceptable **G**rowing **S**tock
<http://www.gov.ns.ca/natr/library/forestry/reports/REPORT91.pdf>
 - Species composition by basal area
 - Basal Area by Diameter class (Dbh). At minimum, 5 cm Dbh classes are required.
 - Regeneration stocking by species
 - Special Wildlife/Biological features
 - Silviculture Prescription
- For a sample report including this information see the following case study
- Following the case study blank PTA tally sheets are included
- Lastly a brief description of the electronic PTA collection system follows.

Case Study

The attached tally sheets show the data collected from a PTA performed on a stand in Queens County (Figure 1). This assessment is used as an illustration of how PTA is used for prescribing harvests. Also shown is a harvest plan report produced from this PTA (Table 1). This plan illustrates the information requirements for PTAs on crown land. Table 1 shows the minimum required stand level data for use in prescribing ecosystem based management activities.

As a result of the assessment the following information was determined:

Sample Cruise Summary

Vegetation Type	SH-4 : Red spruce – White Pine/Lambkill/Bracken
Soil Type:	ST2 – Fresh, Medium to Coarse textured Soil
Tolerant Species:	60%
Eastern Hemlock:	45%
Red Spruce:	15%
Total Growing Stock:	47 m ² /ha
Sawlog Stock:	38 m ² /ha
Acceptable Growing Stock (10cm+)	35 m ² /ha
Uniform Distribution:	83%

Recommended Stand Prescription

Based on the information collected in this sample the Tolerant Softwood/Mixedwood Management Guide recommends an Individual Tree Selection. During the assessment, the FEC Guide identified the vegetation type (SH-4 : Red spruce - Hemlock, Wild lily-of-the-valley) as one characterized by infrequent disturbance regimes. The soil was identified as a Fresh, Medium to Coarse textured (ST2) and the site was moderately exposed to winds making the windthrow hazard low. The majority of the trees are mature long-lived and shade tolerant species of acceptable growing stock uniformly distributed throughout the stand. These characteristics make the stand a suitable candidate for selection management (5).

Figure 1. Sample Completed Tally Sheets. See Appendix I for Definitions.

Pre Treatment Tree Assessment Tally Sheet Date: <u>June 25, 2008</u> Prism Factor: <u>2</u> *****Case Study*****																									
Loc: <u>Milton</u> Co: <u>Queens</u> BL: <u>1</u> ST: <u>1</u> # Plots: <u>6</u> Cruiser: <u>TM</u> Page: <u>1</u> of <u>1</u>																									
Sp	RS		EH		WP		RM																		
TC	UGS	AGS	UGS	AGS	UGS	AGS	UGS	AGS																	
Dbh																									
5							1																		
10	1		3	1																					
15	3		2		3		1	1																	
20	3	4	1		1			1																	
25		6	1	8	2		1																		
30		2	2	11		9																			
35	1	1	2	6		10																			
40			1	10		12																			
45			3	3	1	6																			
50			2	5		6																			
55						1																			
70			2																						
90				1																					

Pre-Treatment Site Assessment Tally Sheet. Loc: Milton Co: Queens Stand: 1 (0819) *****Case Study*****

Plot	ST	VT	BD	EX	WET	TF	WT	WF	Patch	Regen	Heights/age
1	2	SH4	-	M	-	-	-	D	U	BF/D/5/0.7, RS/D/5/1.0	17.8
2	2	SH4	-	M	-	-	-	-	M	EH/D/50/0.1	18.8
3	2	SH4	-	M	-	C	-	-	U	-	18.2
4	2	SH1	-	M	-	-	-	-	U	EH/D/50/3.0, RS/CD/5/2.0	17.9
5	2	SH3	-	M	-	-	-	-	U	EH/D/5/2.0, RS/D/2/2.0	19.1
6	2	SH3	-	M	-	-	N	-	U	AB/D/80/3.0	18.5

Comments:

Figure 2. Minimum Required Data for Pre-Treatment Assessment. Sample output of PTA Computer Program.

06 March 2013

Harvest Plan Summary Table (3)

Page 1 of 2

Location	Stand, Plot (Ref #) Count	Area (ha)	VT	ST	EX	WH	TBA (m2/ha)	AGS (m2/ha)	Species %	DBH Size Class (cm) (m2/ha)				Regen. Stocking %	Wildlife/ Geology	Rx	Notes	
										<15	15-20	>=25	>=35					
Milton	1 (08019)	6	6.0	SH4	ST2	M	Low	47	35	45eH36wP15rS4rM	2	7	38	24	15Total 9eH2r5	N,D,C	SS	1

See Notes and Legend on the last page(s) of the report

Notes:

1. The goal is to increase the proportion of Red Spruce and Hemlock and move the stand to a SH3 - Red Spruce - Hemlock / Wild lity-of -the-valley vegetation type.

VT: FEC vegetation type ST: FEC soil type EX: Exposure: E=Exposed, ME=Moderately exposed, M=Moderate, MS=Moderately sheltered, S=Sheltered WH: Windthrow Hazard
 TBA: Total Basal Area AGS: Basal area of Acceptable Growing Stock Species: Breakdown of species by basal area DBH Size Class: Basal area by diameter class (cm)
 Regen Stocking: Regeneration stocking to 2.4m spacing by all species, and broken down by species, top 4 shown Note: Comment number, see footnotes.

Rx: Prescription		Wildlife/Geology: Special wildlife and biological features by category		
CR=Crop tree release	OT=Other	V=Vernal pools	K=Karst	CT=Cavity trees (>20cm dbh with cavity of size suitable for nesting)
CT=Commercial thinning	PC=Precommercial thinning	S=Springs	R=Ravine	N=Nests (raptors, heron colonies)
GS=Group selection	SH=Shelterwood	ST=Streams	O=Rock outcrop/Boulder fields	M=Mast (oak, beech or witch hazel with mast)
HB=Refer to Forestry Field Handbook	SS=Single tree selection		C=Caves	D=Deer wintering areas, W=Wildlife concentrations
LG=Let it grow	ST=SeedTree			SR=Species at risk/concern
OR=Overstory removal	*=User defined prescription			(http://www.gov.ns.ca/natr/wildlife/biodiversity/species-recovery.asp)

Appendix I

Blank Tally Sheets – Definitions Follow Tally Sheets

Pre-Treatment Tree Assessment Tally Sheet - Tree Codes (TC):

Softwoods:

U- Unacceptable Growing Stock (UGS) - will not make sawlog or studwood quality stem in the future or has stud or sawlog quality stem now but tree will degrade in quality before the time of the next harvest. If the tree vigor is low due to reasons such as broken/dead tops, insect/disease damage, small crowns (<1/3 live crown ratio) etc which make it a poor candidate to leave growing as a future crop tree in a partial harvest, it should be called an UGS.

A - Acceptable Growing Stock (AGS) - will make a studwood or sawlog quality stem in the future or has one now and will still have studwood or sawlog quality at the time of the next harvest.

Hardwoods:

U- Unacceptable growing Stock (UGS) - will not make sawlog quality stem in the future or has sawlog quality stem now but will degrade in quality before the time of the next harvest. If the tree vigor is low due to reasons such as broken/dead tops, insect/disease damage, small crowns etc which make it a poor candidate to leave growing as a future crop tree it should be called an UGS.

A - Acceptable Growing Stock (AGS) - will make a sawlog quality stem in the future or is one now and will maintain or improve in quality by the time of the next harvest.

Pre-Treatment Site Assessment Tally Sheet:

Codes

ST- FEC soil type

VT- FEC vegetation type

BD - Blowdown indicators: **E**=Existing windthrow, **MP**=Mound and Pit topography, **S**=Sphagnum moss

EX – Exposure: **E** = Exposed; **ME** = Moderately Exposed; **M** = Moderate; **MS** = Moderately Sheltered; **S** = Sheltered

WET – Non mapped wetlands: **V** = Vernal Pools, **S**= Springs, **ST** = Streams

TF – Topographic Features: **K**=Karst, **R** = Ravine, **O** = Rock Outcrop/Boulder fields, **C**= Caves

WT – Wildlife Trees: **CT**=Cavity Trees (trees greater than 20 cm dbh with existing cavity of size suitable for nesting), **N**=Nests (raptors, heron colonies), **M**= Mast (oak, beech or witch hazel with mast)

WF – Wildlife Features: **D**=Deer Wintering Areas, **W**=Wildlife Concentrations, **SR**=Species at Risk/concern

(<http://www.gov.ns.ca/natr/wildlife/biodiversity/species-recovery.asp>), **U**=Unique features (specify in comments).

Patch: - is the area around the sample plot dominated by **M** - mature to over mature trees, **I** - Immature AGS, **R**- Advanced regeneration of preferred species, or a **U**- Uniform mix of all age classes

Regen-Regeneration: Species, Dominance (**D**= dominant; **C** - Co-dominant, **S** - suppressed), Stocking to 2.4 m spacing (%), Average Height (m) eg: rS/D/30/0.3 - red spruce dominant 30% stocking, 30cm tall

Heights/ages: Heights for volume calculations (Tree of average basal area in metres) and/or Land Capability determination (breast height age and height of Dominant free growing trees in metres)

PTA Data Collection and Summary Computer Program

As an alternative to collecting PTA information via tally sheet, a computer program has been developed for electronically collecting data in the field. This program has the ability to make all compilations necessary for the PTA summary and to produce standard tables that meet the requirements for PTAs.

This program is developed for Windows® operating systems and has been tested on Windows XP, 7 and 8 machines. The data collection screens have been designed to run on a Panasonic UF-1 Toughbook®. The UF-1 is a fully-ruggedized, all-weather, sealed unit with a 5.6 inch widescreen WSVGA touchscreen with 1024x600 resolution.

The PTA program can be found and downloaded from the Provincial web site.

Installation Instructions

The files needed to install the PTA program on your desktop computer or field data collector can be downloaded from the provincial website. Once the downloaded “pta.zip” file is copied to your local drive, it can be extracted using an extraction program such as IZark®. Once pta.zip is extracted, the folder it is extracted to will contain the files “readme_pta.txt” and “pta.exe”. It will also contain two subfolders named "Disk1" and “PDF”.

The “readme_pta.txt” file contains further installation instructions. It can be opened with any txt-file reader such as “notepad”. “Notepad” is included with windows operating systems in the “accessories” folder under the “all programs” menu.

Overview of PTA Capabilities

- Runs on any Windows® XP, 7 or 8 computer with a minimum 5.6 Inch screen size
- Provides template for entering required PTA data
- Provides stand level compilations necessary to produce harvest plan.
- Includes File Management Utilities to organize data
- Includes ability to organize plot data into stands
- Ability to provide recommended prescription according to the Tolerant Management Guides (4)(5)

Overview of PTA Operation

Once the program is installed it can be run by clicking on the “pta.exe” executable or shortcut.

The program consists of a file management screen and several entry screens that will help to insure required data is collected and organized into folders. It also has several reports that make the necessary compilations and outputs to produce standard reports in PDF format for electronic storage.

The first screen lets the user identify where the data is to be stored and allows importing or exporting data into and out of various folders on your computer.

After designating the work directory and clicking on “Edit Current”, the first data entry screen is shown. It is used to enter site information and to set up the electronic tally sheet.

Once the stand info is saved, a screen appears where tree species are entered, again for setting up the tally sheet.

After the tally sheet is defined, the user can then tally trees in appropriate categories by clicking the appropriate box. The number of trees in that box will then be incremented by 1 for every click.

After tallying all the trees in the plot, click the plot button. This will take the user to the plot information entry screen. In this screen required FEC, site, height and regeneration data is entered.

After this information is collected the user can click the “new plot” button. This will cycle back to the tally sheet screen and plot screen to add another plot to the stand information

Once the information for all plots is entered the user can click on the summary bottom. A stand summary screen is then shown where stand summary information is entered.

Upon completion of these entries, the user has access to two reports that summarize the data, automatically making stand level compilations.

The “Summary Report (1)” shows standard summary statistics for the stand including basal area by AGS and species, height, LC, FEC, DBH, regeneration and other site info.

The “Calculations Report (2)” shows stand information required to make a prescription in the Management Guides.

Any of the reports can be either printed to a physical printer or a PDF file for electronic storage by right clicking on the report which will activate a view/print menu.

The third button on the bottom of the stand summary page will activate the prescription screen

This screen will show the prescription based on the data entered according to the Management Guides (4 & 5). If no management guide is available for the stand cruised, a message “refer to forestry field handbook (6)” will be shown in the prescription box.

The user has the option to define an alternative user defined prescription at this time and to make notes.

The bottom tab on the side of this screen will activate information concerning the decision path used in the management guides to obtain a prescription.

A “harvest plan report (2)” can be activated at this screen. This screen shows a summary report of the required stand summary information for PTAs. The information for each stand cruised is shown on a separate line. The user can choose to select all or a portion of the stands for which data was collected.

When clicking the “Quit” button the File Management screen will be shown. To quit the program click “Quit” on this screen

Help is imbedded in the program and can be activated on any screen by activating the “about“ button.

References

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