

6.9 Appendix I. Stand Selection Process Using Remsoft Woodstock-Stanley Harvest Scheduling Model

6.9A. Goal and Objectives

The goal of this project is to incorporate landscape-level information about existing spatial patterns and forest conditions into stand treatment designations. (i.e. to create a 10-year stand treatment list.)

6.9B. Process

The stand treatment lists were generated using Remsoft Spatial Planning System (RSPS, Fredericton, NB, Canada), a forest estate and harvest schedule model based on linear programming (LP). LP is an optimization technique where an algorithm searches for the “best” solution – “best” being that the solution satisfies a mathematical objective. For subsection planning the objective is to maximize total cordwood volume harvested relative to a set of management constraints or goals at the subsection level. In the SFRMP a 50-year planning horizon, consisting of 10 5-year planning periods, was used throughout. Only the initial 10 years were used to create the stand treatment list and the remaining 40 years served as a check on longer-term goals and sustainability.

RSPS was initialized using a subset of FIM variables and stands: Only age, cover type, and site index were used. Growth and yield were determined using published volume equations from Walters and Ek (1993, Whole Stand Yield and Density Equations for Fourteen Forest Types in Minnesota, *Northern Journal of Applied Forestry*, 10:75-85). These stand-level equations allow for the calculation of merchantable gross volume, basal area, and quadratic mean diameter at any given age. Due to the nature of the subsection the only cover types included in the RSPS were Aspen, balm of Gilead, Tamarack and Black Spruce. No other cover types were modeled because their acreage amounts were inconsequential. For example, the team decided not to include the four acres of white pine in the model. However, stands from the non-modeled cover types were added “manually” to the 10-year treatment list based on the plan’s management recommendations for each cover type.

The tables shown below detail the model constraints that were used to generate the 10-year stand exam list:

Table 6.9a. Model constraints that were used to generate the 10-year stand exam list.

Cover Type(s)	Group	System	Stand Exam List	Merchant -able Age	NRA	MRA	DFFC EERF % ²	% EERF in 1st Bar > NRA ²
Ash/Lowland Hardwoods ¹		Uneven-aged	Model					
Aspen/balm of Gilead/Offsite Aspen*	"T" stands	Even-aged	Model	35	45	65	3.0%	67.0%
	"O" stands	Even-aged		35	45	65		
	"S" stands	Even-aged	Model	35	45	45	0.0%	NA
	"R" stands	Even-aged	Model	31/5	45/20	45/20	0.0%	NA
	"C" stands	Even-aged	Model	31/NA	45/NA	45/NA	NA	NA
Black Spruce, Lowland	SI < 40	Even-aged	Model	80	100	160	11.0%	30.0%
Black Spruce, Lowland	SI ≥ 40	Even-aged	Model	70	90	120	16.0%	45.0%
Tamarack	SI < 40	Even-aged	Model	70	100	160	5.0%	30.0%
Tamarack	SI ≥ 40	Even-aged	Model	50	80	120	5.0%	30.0%
Balsam Fir		Even-aged	Area Staff	40	50	60		
Birch		Even-aged	Area Staff	35	45	55		
Lowland or Upland Grass/Lowland or Upland Brush	Grass/Brush	NA	Area Staff					
Hybrid Poplar		Even-aged	Area Staff					
Jack Pine		Even-aged	Area Staff	35	50	70		
Northern Hardwoods		Uneven-aged	Area Staff					
Northern White Cedar		Uneven-aged	Area Staff					
Oak		Even-aged	Area Staff	35	80	170		
Red Pine		Even-aged	Area Staff	30	100	150		
White Pine		Even-aged	Area Staff					
White Spruce		Even-aged	Area Staff	30	70	100		

Table 6.9b. Model constraints that were used to generate the 10-year stand exam list.

Cover Type(s)	Group	DFFC Age-Class Distribution ³	Current ERF Acres	Current Acres	10-year DFFC Acres	10-year DFFC % (+ or -)	50-year DFFC Acres	50-year DFFC % (+ or -)
Ash/Lowland Hardwoods ¹		NA		3,101	3,101	0.0%	2,801	-9.7%
Aspen/balm of Gilead/Offsite Aspen*	"T" stands	Yes	3,809	28,560	28,560	-1.4%	28,560	-2.6%
	"O" stands			749	349		0	
	"S" stands	Yes	0	16,576	16,576	-13.6%	16,576	-27.3%
	"R" stands	Yes	0	24,595	24,595		24,595	
	"C" stands	No	0	15,478	7,750		0	
Black Spruce, Lowland	SI < 40	Yes	495	1,161	1,161	0.0%	1,161	0.0%
Black Spruce, Lowland	SI ≥ 40	Yes	422	536	536		536	
Tamarack	SI < 40	Yes	397	1,758	1,758	0.0%	1,758	0.0%
Tamarack	SI ≥ 40	Yes	357	1,996	1,996		1,996	
Balsam Fir		No	47	98	98	0.0%	98	0.0%
Birch		No	56	94	94	0.0%	94	0.0%
Lowland or Upland Grass/Lowland or Upland Brush	Grass/Brush	NA		181,083	188,816	4.3%	196,646	8.6%
Hybrid Poplar		No	0	5	0	-100.0%	0	-100.0%
Jack Pine		No	0	166	166	0.0%	166	0.0%
Northern Hardwoods		NA		233	233	0.0%	233	0.0%
Northern White Cedar		NA	215	215	215	0.0%	515	139.5%
Oak		No	967	967	1,367	41.4%	1,716	77.5%
Red Pine		No	0	80	80	0.0%	0	-100.0%
White Pine		No	4	4	4	0.0%	4	0.0%
White Spruce		No	0	148	148	0.0%	148	0.0%
Total			6,767	277,603	277,603		277,603	