

5.1 Background - Height Stratums

The stands within the Park have been grouped into one of four height stratums for descriptive and management purposes. Individual stands have been grouped into each stratum based on the height class that dominates the stand. The regenerating stratum is defined as including space from the forest floor to 1 metre in height. Currently this stratum contains shorter woody shrubs, ferns, herbaceous plants and tree seedlings. This stratum is considered to be the nursery for future trees as the forest continues to develop and evolve. The established stratum is defined at the height class that ranges from 1 to 5 m in height above the forest floor and captures vigorous regeneration that originated during the 2004 growing season, both from seed and vegetative propagation. This stratum is dominated by tree and woody shrub species. If the established stratum is not continuous in terms of crown cover, stands are classified as regenerating. The next class is the immature stratum which captures witness stands that are on average, less than 50 years of age. Mature stands make up the last stratum and capture remnant witness grooves that do not have a well developed established or regenerating layer.

5.2 Density Control

The forested areas within the Park that experienced severe damage during Hurricane Juan have regenerated extensively through natural means. The existing new forest is composed of a variety of needle-leaved and broad-leaved tree species and also includes a large number of woody shrubs and exotic trees.

One of the main management objectives identified within the Comprehensive Plan is to encourage the development of a diverse Acadian forest ecosystem. Additionally, management is designed to minimize the new forest's susceptibility to future extreme storm events. Forest resistance to windthrow can be achieved through species selection, i.e., favouring more wind-firm, broad-leaved forest tree species, and density control to ensure that trees within the forest develop at reduced competitive levels which will increase their wind-firmness.



Photo: 12. An area that was thinned in 2007

Density control will be the preferred mechanism to actively manage the established regeneration within the Park. Density control will be completed using manual techniques, such as thinning (Photo 12), which will allow for individual tree selection preferences based on specific parameters identified within this work plan. Initially, the new forest can be considered as even aged, however, over time, management activities will be designed to accelerate the development of an uneven aged structure. Within this work plan, density control will be focused on the established height stratum which the authors have defined as the 1 to 5 m height class and is primarily composed of natural regeneration that became established during the summer of 2004.

The regenerating height stratum (0 to 1 m) contains needle-leaved trees, broad-leaved trees, woody shrubs and a variety of herbaceous forest plants. As the new forest develops, the regenerating stratum will play a key roll in providing recruitment into the next stratum as light and competitive levels become favourable.

The key is to manage density in relation to average stand height. Table 5.1 shows various tree spacings and stand densities for forest stands for spacing factor (SF) values of 50% and 30%. This table is a practical guide to prescribing field treatments since actual tree height will vary in the field. Tree spacing should be maintained between the 50% and 30% level for any given location.

Table 5-1: Recommended Stand Density and Tree Spacing Ranges Based on Mean Stand Height (SF Threshold Values of 50% and 30%)

<i>Mean Tree Height (m)</i>	<i>Lower Range</i>		<i>Upper Range</i>	
	<i>Tree Spacing</i>	<i>Stand Density</i>	<i>Tree Spacing</i>	<i>Stand Density</i>
1	0.50	40,000	0.30	111,111
2	1.00	10,000	0.60	27,778
3	1.50	4,444	0.90	12,346
4	2.00	2,500	1.20	6,944
5	2.50	1,600	1.50	4,444
6	3.00	1,111	1.80	3,086
7	3.50	816	2.10	2,268
8	4.00	625	2.40	1,736
9	4.50	494	2.70	1,372
10	5.00	400	3.00	1,111

5.3 Fill Planting

Fill planting is designed to work towards achieving the management objectives the Park. A range of broad and needle-leaved tree seedlings have been ordered and are expected to be planted in the spring of 2008. Fill planting will be used to either increase broad-leaved or needle-leaved species components within areas that are currently considered to be well regenerated. Fill planting will also be used to augment tree density in areas that are not adequately stocked with forest tree species.

Specific species placement strategies are based on a hierarchical approach starting with the management areas which define the broad needle-leaved/broad-leaved species ratios. Stand levels identify areas with similar characteristics and stands with low levels of established regeneration in the 1 to 5 m stratum are considered to be in the regenerating phase of stand development. Regenerating areas with lower tree densities are targeted for planting. Within stands and management units, specific ecotypes have been identified which will focus species selection. These ecotypes are based upon forest ecosystem classification techniques by NSDNR, and are summarized in Table 5.2 (Neily, *et al.*, 2004). Table 5.3 summarizes the planting list for 2008 and the various suitable ecotypes.

Table 5-2: Forest Ecotypes of Point Pleasant Park*

<i>Ecotype</i>	<i>Name</i>	<i>Area (ha)</i>	<i>Area %</i>
ET5	Fresh-Medium Conifer	55.1	88
ET6	Moist-Medium Mixedwood	7.0	11
ET9	Wet-Rich Deciduous	0.8	1
ET8	Moist-Rich Mixedwood	0.1	<1

(*) From Neily, Keys and Quigley, 2004.

The shade tolerance for each species is provided to ensure seedlings are planted in favourable microsites. For example, both Large-tooth and Trembling Aspen are very shade intolerant and should not be planted on microsites with overtopping vegetation. In contrast, Sugar Maple is very shade tolerant and can be planted under overtopping vegetation. Overtopping vegetation can consist of trees, shrub or herbaceous plants.

Table 5-3: Fill Planting Suitability Matrix

<i>Species</i>	<i>Code</i>	<i>Moisture</i>	<i>Exposure</i>	<i>Slope</i>	<i>Ecotype</i>	<i>MA*</i>	<i>Shade Tol**</i>
Ash, Black	BAS	Moist	All	Lower	ET6, ET8	SFS	Inter
Ash, White	WAS	Fresh	All	Middle/Upper	ALL	SFS	Inter
Aspen, Large-tooth	LTA	Fresh	South	Middle/Upper	ET5,ET6	SFS	VI
Aspen, Trembling	TA	Moist/Fresh	ALL	Lower/Middle	ET5,ET8	SFS	VI
Birch, Yellow	YB	Moist/Fresh	All	All	ALL	SFS	Inter
Cherry, Black	BC	Moist	North/East	Lower	ET9	SFS	Intol
Elm, American	WE	Moist/Fresh	All	Mid to lower	ET6,ET6,ET9	SFS	Inter
Hemlock, Eastern	EH	Moist/Fresh	North/East	All	ALL	No SFS	VTol
Ironwood	IW	Fresh	All	Mid to upper	ET8	SFS	
Larch	TL	Wet/Moist	All	Lower/Middle	ET6,ET8	No SFS	VI
Maple, Red	RM	Moist/Fresh		All	ALL	SFS	Tol
Maple, Sugar	SM	Moist/Fresh		Middle/Upper	ALL	SFS	VTol
Oak, Red	RO	Moist/Fresh	North/east	Lower/middle	ET5,ET8,ET9	SFS	Inter
Pine, Jack	PJ	Fresh/Dry	All	Middle/Up	ET5	No	VI

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				per		SFS	
Pine, Red	RP	Fresh/Dry	All	Middle/ Upper	ET5	No SFS	Intol
Pine, White	WP	Moist/Fresh	All	Lower/ Upper	ET5,ET6,ET 8	No SFS	Inter
Willow, Pussy	SA	Moist/Wet	All	Lower	ET9	Ponds	Intol

* Management Areas (SFS = South-Facing Slopes)

** Shade Tolerance (VTol=very tolerant, Tol=tolerant, Inter=intermediate, Intol=intolerant, VI=very intolerant)

5.4 Past Treatments

Active forest management was completed during 2007 and consisted of fill planting a variety of Acadian forest trees species and completing density control within defined areas of the Park. Past treatments were consistent with the Comprehensive Plan and this Work Plan.