Implementation of Nova Scotia Interim Old Forest Policy for Crown Land

"A Status Report"



REPORT FOR 2008 - 1

Renewable Resources Branch - Ecological Technical Committee

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Implementation of Nova Scotia Interim Old Forest Policy "A Status Report"

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Old Growth Forests of the Grand Anse Valley, Nova Scotia © J.F. Bergeron/Enviro Foto

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TABLE OF CONTENTS

INTRODUCTION
METHODS
RESULTS
Area and Percentage of Forest Selection
Age of Forest Selected Under the Interim Old Forest Policy
Ecological Representation of Potential Climax Forest Types
Composition of Current Forest Communities 8
Size Distribution of Old Forest Patches
LITERATURE CITED
APPENDIX I - Representation of Potential Climax Forest Types in Each Ecoregion 12
APPENDIX II - Representation of Potential Climax Forest Types in Each Ecodistrict 15
APPENDIX III - Mapped Distribution of Old Forest Patches

INTRODUCTION

In Nova Scotia the long and extensive history of forest alteration, the large proportion of land in private ownership, and the dynamic nature of forest growth cycles, make it challenging to find and conserve old forest in the province. In 1999, Nova Scotia implemented the Interim Old Forest Policy¹ (NSDNR, 1999a) to identify and increase the representation and protection of old forests on Crown land and to support the long-term restoration of old growth forest in the Province.

The Interim Old Forest Policy is intended to clarify and consolidate the Department's initiatives to maintain old forests in the landscape. The primary goal is to set aside the best remaining old growth forests and old forest restoration opportunities by addressing gaps in old forest representation within the existing protected areas system (NSDNR, 1994). This will establish a network of high quality old forests that provide a critical component for forest age class planning.

The specific policy commitment by the province is to set aside as old growth and old forest, a minimum of eight percent of Crown land in each of the 39 forested ecodistricts defined by the Ecological Land Classification (ELC) for Nova Scotia (Neily et.al., 2003). Where possible, the selected forest should provide a full representation of the climax forest types that are ecologically natural for the ecodistrict, as determined by the "potential climax forest" mapping associated with the ecosection level of the ELC. The Policy provides three criteria to aid decision making: I) favouring older stands in later stages of succession, ii) selecting larger stands and groups of stands, and iii) opting for stands with higher proportions of climax species.

The purpose of this document is to report on the implementation and achievements of the Interim Old Forest Policy up to 2008.

METHODS

The policy was implemented by Department of Natural Resources Regional Services Integrated Resource Management (IRM) planning teams who assessed and selected stands following the five step procedure outlined in the policy. These steps provided a sequential approach toward fulfilling the policy commitments, as follows:

Step 1: All old growth (> 125 years old) within existing protected areas (including federal parks) is given the first priority to meet the policy targets.

The 1999-2003 provincial forest inventory (NSDNR, 2004) indicates that only 0.3 percent of the province is over 105 years of age. Therefore it was assumed that no ecodistrict had sufficient old growth in protected areas to meet the policy target, and a search of protected lands for old growth was not necessary to verify this.

¹The complete Interim Old Forest Policy is available on-line at: http://www.gov.ns.ca/natr/forestry/planresch/oldgrowth/policy.htm

Step 2: All old growth (> 125 years) on Crown land outside of protected areas (IRM - C1, C2) is the next priority for meeting the policy targets.

IRM teams assessed all known old growth and identified it under the policy. A moratorium was placed on harvesting any stands found to be over 125 years of age. During operations planning any old stands encountered that were potentially old growth were assessed using the old forest scoresheet in the policy to determine their status. As with step 1, it was assumed that no ecodistrict had sufficient old growth to meet the policy targets, and a full inventory of all lands was not required to verify this.

Step 3: Within protected areas (C3) all "climax" forest stands greater than 40 years of age are considered old forest restoration opportunities, and are given the next priority to meet the policy targets.

A query of the Geographic Information System (GIS) forest inventory² was carried out to identify all qualifying stands within protected areas. These were mapped and the data was summarized by ecodistrict to identify gaps regarding the area and climax forest representation targets of the policy.

Step 4: Where gaps existed, the best old forest restoration opportunities on Crown land outside of protected areas (C1, C2) are identified and set aside following the criteria and objectives of the policy.

From a practical stand point, most of the implementation effort occurred at this step. A GIS based old forest prediction tool was developed to help identify promising candidates. Training sessions were conducted in all regions. Professional knowledge, and the experience of the regional IRM teams with their areas was then relied upon to find the best candidates. Planning was assisted with aerial photography and site visits. A number of stands were field assessed using the old forest scoring procedures. In making final selections, teams employed professional judgement to balance the objectives for old stand conditions, large patch size, and ecological representation, as well as trying to achieve other multiple values where opportunities presented.

Step 5: Select additional area above the policy targets where regionally important features exist.

IRM teams identified a significant amount of area beyond the eight percent policy target in many of the ecodistricts. In some cases this was necessary to meet objectives for climax forest representation, while in others it was a recognition of important stand qualities, and opportunities to improve patch sizes.

² GIS Digital Database, N.S. Dept of Natural Resources, Forestry Division, Truro.

In 2006 the selection of old forests under the policy was completed, and the stands were identified as an old forest layer of the GIS. An old forest scoring program was developed to permanently store data from scored stands and link it spatially to the GIS. This file currently contains 186 stands and continues to grow as more stands are scored on both Crown and private land. As illustrated in Figure 1, Figure 2, and Table 1, gaps still exist in meeting the policy targets and IRM teams continue to seek opportunities to fill these.

RESULTS

Area and Percentage of Forest Selection

An analysis of the selected old forests indicates that Nova Scotia's existing parks and protected areas (C3- forest reserves) currently hold approximately 177,000 ha. Nineteen of the 39 ecodistricts meet the policy target of 8 percent of Crown forest with this forest. Selections on non-reserve Crown land (C1, C2)add an additional 39,722 ha of forest with good restoration potential, increasing the number of ecodistricts meeting the target from 19 to 31. Provincially, 17 percent of Crown forests (216,711 ha) have now been selected under the Interim Old Forest Policy. Eight ecodistricts are still short of the 8% target, and collectively require an additional 4,165 ha. Six of these ecodistricts have had significant areas of old forest selected (5 to 7.5 percent). However, the Annapolis Valley and Cumberland Marshes present the biggest challenges, as both are dominated by non-forest landscapes with very limited old forest restoration opportunities on Crown land. The Annapolis Valley has no old forest identified, and requires 114 ha to meet the target level. The Cumberland Marshes, while only requiring 33 hectares to meet the 8 percent target, has only half of this identified. This illustrates an important limitation for ecodistricts with little Crown land, and highlights an opportunity to involve other ownerships.

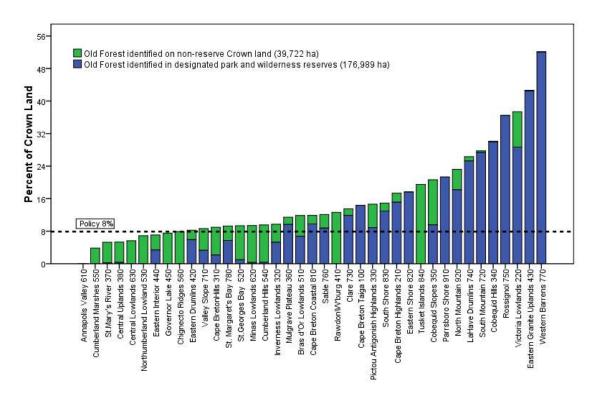


Figure 1. Percentage of Crown land identified in each ecodistrict under the Interim Old Forest Policy

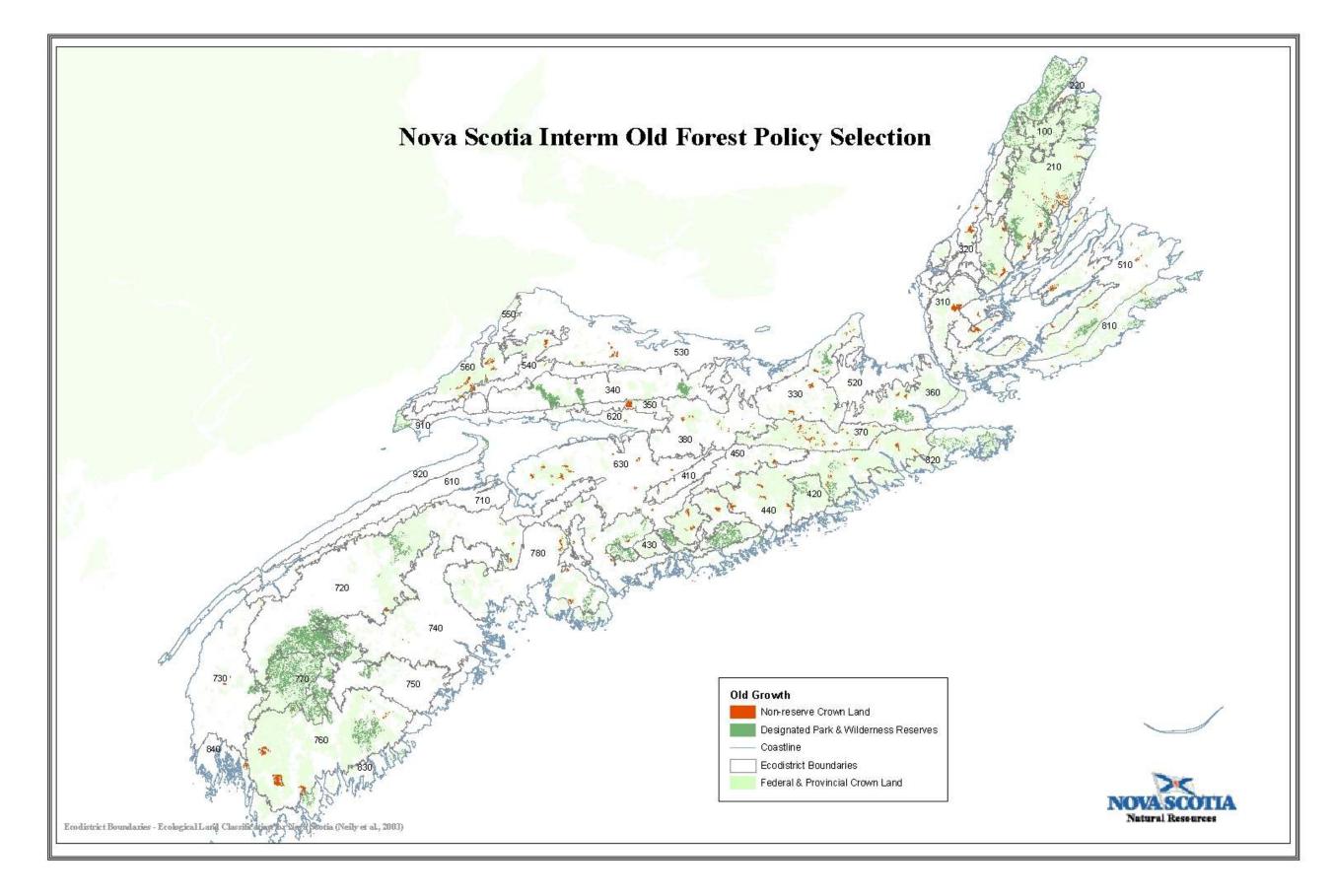


Figure 2: Map illustrating locations of forests identified under the Interim Old Forest Policy.

Age of Forest Selected Under the Interim Old Forest Policy

Assessment of the quality of the old forest selections is ongoing, and includes field assessment and old forest scoring as well as analysis of DNR's two continuous forest inventories, the remotely sensed GIS Forest Inventory (NSDNR,1999b), and the ground based Permanent Sample Plot (PSP)system (NSDNR, 2004). Old forest selections will be evaluated to determine the representation of climax forest types, the size of old forest patches, the amount of true old growth, as well as the quality and age of the selected forests. The current PSP inventory provides an initial assessment of the age distribution of the selected forest (Figure 3). One hundred sixty-two (162) permanent sample plots are randomly located within the selected areas and were remeasured between 1999 - 2003, with 3 average trees aged in each plot (NSDNR, 2004).

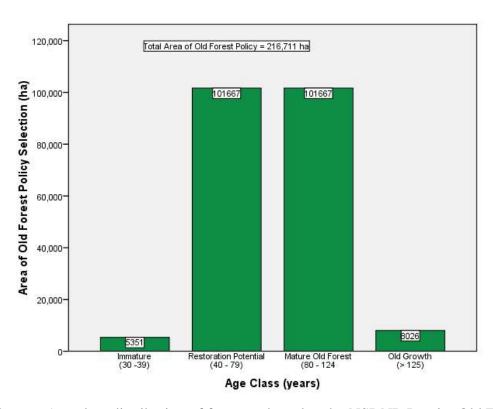


Figure 3. Age class distribution of forests selected under NSDNR Interim Old Forest Policy as determined from 162 randomly established Permanent Sample Plots measured between 1999-2003 (NSDNR, 2004).

The inventory indicates that 8026 ha of the area selected is "old growth" (>125 years old), with an average age of 146 years. Approximately half of the area selected (101,667 ha) is at a "mature old forest" stage of development (80-124 years old), with an average age of 97 years. Most of this should be in the "transition stage" of succession that precedes old growth, and thus should be developing important structural characteristics, such as large trees, snags, coarse woody debris, and understory growth. The remaining forest selected under the policy is primarily between 40 - 79 years old, with an average age of 64. This forest will provide old forest restoration opportunities in the future, however most would not yet be in a "transition stage" of succession. In many cases this younger forest is intermixed with older stands, which were selected as a group in order to create larger forest patches. Despite its younger age, much of this

"restoration" age forest may be starting to develop mature forest features that can help support connectivity, and contribute interior habitat conditions.

Ecological Representation of Potential Climax Forest Types

One of the objectives of the interim old forest policy is to provide a full representation of the climax forest types that are ecologically natural for the ecodistrict. The ecosection level of the Nova Scotia Ecological Land Classification (ELC) provides interpretation and mapping of the potential climax forest types and was used to guide the selection of ecologically representative old forests³ (Neily et.al, 2003).

At a provincial scale, the forests identified under the policy provide a full representation of all 27 climax forest types that are described in the ELC (Table 1). For a number of climax types the selection of old forests in non-reserve areas was particularly effective in improving the ecological representation, especially for those types that are naturally less common. An important example is the interval ecosections along rivers that support climax forests of elm, sugar maple, and ash. These unique ecosystems support some of the province's richest biodiversity, and many have been lost through farming and development.

At the ecoregional level, representation of climax communities remains satisfactory, with a few exceptions (AppendixII). Most notably, the Valley and Central Lowlands lack representation of several climax communities. This is the only ecoregion that is below the eight percent policy target. It requires an additional 1040 hectares of old forest in two of its three ecodistricts. The identification of this additional area should provide opportunities to address some of the representivity shortfalls.

Full representation of all climax types natural to the ecodistrict has been achieved in 14 of the 39 ecodistricts (Appendix III). Another 13 have representation of all but one climax type. In most cases, the unrepresented community is similar to others in the ecodistrict, or has good representation in a neighbouring ecodistrict. There are significant representivity gaps, particularly in the less common types such as the elm, sugar maple, ash interval forests. In many cases, the unrepresented community is a small part of the ecodistrict and the Crown has limited or no opportunity to fill these gaps due to ownership restrictions.

³Based on discussions of NSDNR's Ecological Technical Committee 27 climax forest types were described and assigned to the Ecological Land Classification for Nova Scotia (available from NSDNR, Forestry Division, Truro)

<u>Table 1</u>: Representation of potential climax forest types selected under the interim old forest policy.

ELC Based	Productive	Forest Land4	Selecte	d For Old Fore	est Policy	Percent
Potential						Of
Climax Type ⁵	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
	(ha)	(ha)	(ha)	(ha)	(ha)	(%)
aE, sM, wA	25,000	4,548	115	303	419	9
bF	103,031	90,712	8,180	1,697	9,878	11
bS	521,461	187,620	19,257	7,081	26,338	14
bS, bF	78,137	58,443	6,577	1,019	7,596	13
bS, rM	10,819	4,976	1,742	0	1,742	35
bS, wP	734,851	286,026	46,944	8,507	55,452	19
bS, wS	53,174	15,210	970	198	1,168	8
jP, bS, wP	21,178	5,985	0	289	289	5
rM	14,531	6,516	1,839	136	1,975	30
rM, yB	43,088	14,976	797	202	999	7
rO, wP, rP	63,123	33,520	9,542	900	10,441	31
rP, bS, wP	22,976	13,847	0	704	704	5
rS	305,021	70,963	9,124	4,329	13,453	19
rS, eH	59,128	7,756	289	549	838	11
rS, eH, sM, yB, Be	59,673	12,005	3,826	68	3,894	32
rS, eH, wP	578,514	135,361	25,354	1,220	26,575	20
rS, eH, wP, sM, yB, Be	181,639	14,062	2,383	463	2,846	20
rS, eH, yB	49,766	4,951	31	339	369	7
rS, sM, yB, Be	154,125	44,545	1,960	1,263	3,223	7
rS, wP	43,461	18,107	2,183	209	2,392	13
sM, yB	48,073	15,816	2,273	490	2,763	17
sM, yB, Be	794,391	195,258	25,106	8,131	33,237	17
sM, yB, Be, eH, wP	15,233	3,752	357	191	548	15
sM, yB, Be, rO	8,113	1,500	405	160	566	38
sM, yB, rS	36,203	5,725	9	256	265	5
wS, bS, bF	65,672	25,585	2,692	507	3,199	13
yB, bF	35,776	29,005	5,032	510	5,543	19
	4,126,159	1306768	176,989	39,722	216,711	17

⁴ Productive forest land includes all forest with land capability ratings of at least 3 m³/ha/yr for softwood species or 1m³/ha/yr for tolerant hardwoods.

⁵ aE - American elm; sM - sugar maple; wA - white ash; bF - balsam fir; bS - black spruce; rM - red maple; wP - white pine; wS - white spruce; jP - jack pine; yB - yellow birch; rO - red oak; rP - red pine; rS - red spruce; eH - eastern hemlock; sM - sugar maple; Be - American beech. Interpretation of the 27 potential climax forest types is provided by the Ecological Land Classification (ELC) for Nova Scotia (Neily, et.al., 2003), which predicts the climax forest associations that would typically develop at the ecosection level of the ELC. These include both climatic and edaphic types.

Composition of Current Forest Communities

The objective for ecological representivity was implemented based on identifying potential climax types. Theoretically, once stands reach the old growth stage of development, they should evolve into a climax forest type that closely matches the predicted potential climax types.

For comparative purposes it is instructive to look at the current composition of forest communities making up the selected old forest, both in terms of the species composition, and the successional stage. The GIS forest resources photo inventory describes the "current" condition of all forest stands in Nova Scotia (NSDNR, 1999b). These are classified in the Crown Land Forest Model into 12 distinctive forest community types and 3 seral stages (NSDNR, 2005). This data indicates that provincially, the stands selected under the Interim Old Forest Policy include representation of all 12 of these forest community types (Figure 4). The majority of the old forests selected under the policy contain a significant composition of late successional species, with 71 percent classed as late seral, and 25 percent classed as mid seral. The most common forest is late seral spruce, followed by late seral tolerant hardwood, and late seral spruce dominated mixedwood forests. White pine forests, a late seral species, make up a large portion of the selection in the Western Ecoregion (Table 2).

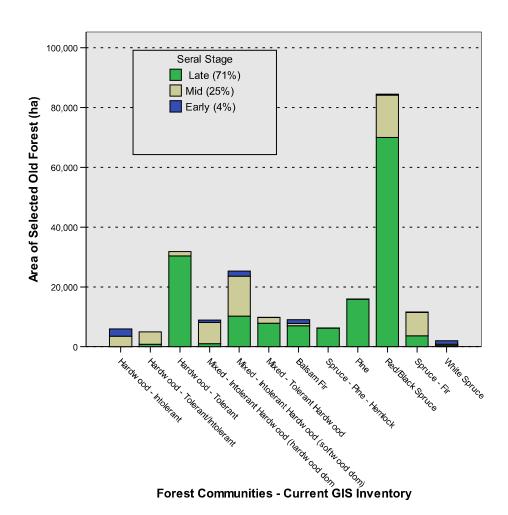


Figure 4. Current composition of the forests selected under the Interim Old Forest Policy, as classified by the Crown Lands Forest Model using the 2006 update of the GIS Forest Inventory.

Table 2. Current forest community types represented in the interim old forest policy selections by ecoregion.

F		Hardwood			Mixewood				Softwo	ood			m
Ecoregion	Intolerant	Intolerant /Tolerant	Tolerant	Intolerant Hardwood Leading	Intolerant Softwood Leading	Tolerant	Balsam Fir	Spruce Pine Hemlock	Pine	Black /Red Spruce	Spruce Fir	White Spruce	Total
1) C.B. Taiga	0	0	25	14	139	0	1,108	0	0	1,539	133	19	2,977
2) C.B. Highland	114	1,468	13,214	1,881	4,494	4,666	4,380	167	0	6,838	1,018	1,584	39,824
3) N.S. Uplands	402	1,276	15,330	362	833	2,686	948	107	279	5,246	674	132	28,275
4) Eastern	525	300	1,044	407	1,688	495	438	717	317	17,455	3,333	1	26,720
5) Northumberland Bras D'or	1,222	707	737	716	962	189	347	71	354	4,166	349	72	9,892
6) Valley & Central Lowlands	67	20	23	172	295	40	121	169	40	1,319	126	17	2,409
7) Western	3,288	1,128	1,034	5,157	15,768	1,622	405	5,045	14,919	39,638	5,247	6	93,257
8) Atlantic Coastal	383	37	80	184	1,005	10	1,366	0	0	7,469	732	183	11,449
9) Fundy Shore	0	32	341	61	202	203	3	0	0	981	85	0	1,908
Total	6,001	4,968	31,828	8,954	25,386	9,911	9,116	6,276	15,909	84,651	11,697	2,014	216,711

Size Distribution of Old Forest Patches

One of the primary objectives of the interim old forest policy was to create large patches of old forests by selecting several adjacent stands of suitable species and age class. Large forest patches have a number of advantages over small patches, including greater interior habitat, better integrity and resilience to disturbance, and more functional connectivity. However, small and intermediate sized patches play a key role in distributing old forest character across landscapes, and often represent the best opportunities to capture high value stands and particular ecological features. The value of patch size is recognized when scoring old forest (NSDNR, 1999a) and seven size classes, ranging from less than 15 ha to greater than 1000 ha are identified.

In order to group the old forest stands into identifiable patches, a simple GIS based "rubber banding" technique was employed (Andison, 2006). A 50 m buffer for stand grouping was used in order to be consistent with the 50 metre buffer used in the Old Forest Policy. The rubber banding technique fills gaps between stands with small connection areas that have a "non-old forest" character. In total this "non-old forest connection" composed less than 4 percent of the total patch area. It should be noted that the choice of buffer size and patch grouping technique is somewhat arbitrary, since different species and process operate at vastly

different scales.

Two thirds of the area (66 %) identified in the policy is located in 32 large patches (> 1000) of old forest, which average 4600 ha in size (Figure 5)(Appendix IV). The majority of this area is located within existing wilderness and park reserves, although a significant amount (15%) of the selection outside of reserves is also in the largest patch sizes. One hundred and eleven patches of old forest are in the large (501 - 1000ha), and medium large (201-500ha) size classes, and represent 8 and 11 percent of the total old forest area respectively. The rest of the old forest area is evenly distributed (4 - 6 percent each) in the small to medium patch size classes that range from 1 to 200 ha. Most of the smallest patches (1-15 ha) are located in the wilderness reserves, and consist primarily of isolated stands, such as islands.

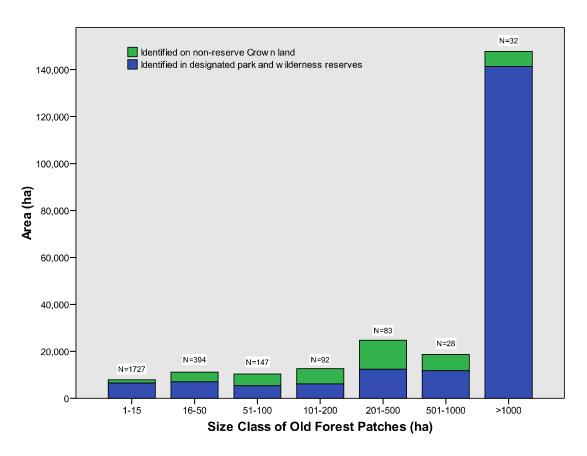


Figure 5. The total area (ha), and number of patches (N), in each of seven patch size classes.

LITERATURE CITED

Andison, D. 2006. Finding Common Ground: Some Definitions. Natural Disturbance Program Integration Note Series, Issue #1. An extension note of the Foothills Model Forest. 6pp. [accessed on: Feb 5, 2008] Available at: http://www.fmf.ca/ND/ND_In1.pdf

Nova Scotia Department of Natural Resources (NSDNR). 2006. Preliminary Crown Lands Forest Model - Landbase Classification. Renewable Resources Branch, Forestry Division, Truro, Nova Scotia Unpublished report.

Nova Scotia Department of Natural Resources (NSDNR). 2004. Nova Scotia Forest Inventory Permanent Sample Plot Field Measurement Methods and Specifications. Version 2004 - 1.2. 66pp. [accessed on: Feb 5, 2008] Available at: http://www.gov.ns.ca/natr/forestry/inventory/reports/1fismanual.pdf

Neily, P.D., Quigley, E., Benjamin, L., Stewart, B., and Duke, T. 2003. Ecological Land Classification for Nova Scotia. Volume 1 - Mapping Nova Scotia's Terrestrial Ecosystems. Report DNR 2003-2. 83 pp. [accessed on: Feb 5, 2008] Available at: http://www.gov.ns.ca/natr/forestry/ecosystem/pdf/ELCrevised2.pdf

Nova Scotia Department of Natural Resources (NSDNR). 1999a. Nova Scotia's old growth forests: interim old forest policy. [accessed on Feb 5, 2008] Available at www.gov.ns.ca/natr/forestry/planresch/oldgrowth/policy.htm

Nova Scotia Department of Natural Resources (NSDNR). 1999b. Forest resources inventory report:Sept 1999. NSDNR Renewable Resources/Forestry Division. Cat.Log.Report FOR1991-1.

Nova Scotia Department of Natural Resources (NSDNR). 1994. A proposed systems plan for parks and protected areas in Nova Scotia. Nova Scotia Department of Supply and Services, Publishing Division, Halifax, Nova Scotia, Canada.

APPENDIX I - Representation of Potential Climax Forest Types in Each Ecoregion

EcoRegion	•	Productive Fore	st Land	Selected	l For Old Fores	t Policy	Percent
	Potential Climax Type	All Owners (ha)	Crown (ha)	Reserve (ha)	Non-Reserve (ha)	Total (ha)	Of Crown (%)
1 - Cape Breton Taiga	a bF	1163	1163	181	0	181	16
	bS	1342	1338	280	0	280	21
	bS, bF	18258	18235	2516	0	2516	14
	Subtotal EcoRegion	20762	20736	2977	0	2977	14
2 - Cape Breton High	lands aE, sM, wA	330	22	0	0	0	0
	bF	101868	89549	7999	1697	9696	11
	bS	22777	21864	1210	1114	2324	11
	bS, bF	27888	24835	3982	213	4195	17
	sM, yB, Be	76817	56605	15484	1441	16924	30
	sM, yB, Be, eH, wP	2648	2262	348	47	395	17
	sM, yB, Be, rO	6287	1429	405	152	557	39
	wS, bS, bF	4530	1484	155	36	191	13
	yB, bF	35776	29005	5032	510	5543	19
	Subtotal EcoRegion	278921	227055	34615	5209	39824	18
3 - Nova Scotia Uplan	nds aE, sM, wA	6429	1052	27	28	55	5
	bS	77453	25048	1941	739	2679	11
	bS, bF	30538	14757	2	807	808	5
	bS, wP	40767	27961	101	1340	1441	5
	bS, wS	7608	1646	1	46	47	3
	rM, yB	17603	8064	0	74	74	1
	rS	88024	25313	1614	2139	3752	15
	rS, eH	20513	3676	228	161	388	11
	rS, eH, sM, yB, Be	56809	11778	3826	60	3886	33
	rS, eH, wP	1805	97	3	2	5	5
	rS, eH, wP, sM, yB,		561	1	79	80	14
	rS, eH, yB	15979	2103	31	205	236	11
	rS, sM, yB, Be	33224	6235	841	109	950	15
	sM, yB	47305	15721	2273	490	2763	18
	sM, yB, Be	355165	79024	6646	4161	10808	14
	sM, yB, Be, eH, wP	3906	370	9	45	54	15
	sM, yB, rS	22782	3608	9	229	239	7
	wS, bS, bF	3133	432	7	1	8	2
	Subtotal EcoRegion	834150	227446	17561	10714	28275	12

$\textbf{APPENDIX I (cont'd) - Representation \ of Potential \ Climax \ Forest \ Types \ in \ Each \ Ecoregion }$

EcoRegion	ELC Based Propertial	oductive Fore	st Land	Selected	d For Old Fores	t Policy	Percent Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
4 - Eastern	aE, sM, wA	2945	1621	79	43	121	7
	bS	141816	70713	5056	2203	7259	10
	bS, wP	58143	33938	3546	1604	5150	15
	rS	56208	23345	7448	296	7743	33
	rS, eH	12240	1124	0	195	195	17
	rS, eH, wP, sM, yB, Be	12890	160	0	40	40	25
	rS, sM, yB, Be	84896	36435	1024	1134	2158	6
	rS, wP	41862	18034	2160	209	2369	13
	sM, yB	769	95	0	0	0	0
	sM, yB, Be	72412	21291	769	921	1690	8
	Subtotal EcoRegion	484181	206756	20081	6644	26726	13
5 - Northumberland Bras	aE, sM, wA	6725	823	3	111	113	14
D'or Loelsnds	bS	83222	18639	185	1788	1973	11
	bS, wP	175839	29038	1627	1708	3335	11
	jP, bS, wP	21178	5985	0	289	289	5
	rS	94695	15086	11	1406	1416	9
	rS, eH	12702	1615	1	75	76	5
	rS, eH, sM, yB, Be	2863	227	0	8	8	4
	rS, eH, wP	14218	1747	32	146	178	10
	rS, eH, wP, sM, yB, Be	34	25	0	0	0	0
	rS, sM, yB, Be	22348	1331	0	20	20	2
	sM, yB, Be	156083	27376	1096	1288	2384	9
	sM, yB, Be, eH, wP	8679	1119	0	100	100	9
	Subtotal EcoRegion	598585	103011	2954	6939	9893	10
6 - Valley & Central	aE, sM, wA	8571	1029	7	122	129	13
-	bS	45799	7909	11	485	496	6
	bS, wP	16854	4656	0	247	247	5
	rO, wP, rP	9930	957	0	0	0	0
	rP, bS, wP	22976	13847	0	704	704	5
	rS	52021	6886	15	465	480	7
	rS, eH	13108	988	0	117	117	12
	rS, eH, wP	12781	300	5	0	5	2
	rS, eH, wP, sM, yB, Be	85	12	0	0	0	0
	rS, eH, yB	33787	2848	0	133	133	5
	rS, sM, yB, Be	808	136	0	0	0	0
	sM, yB, Be	13687	1059	0	68	68	6
	sM, yB, rS	13421	2117	0	26	26	1
	Subtotal EcoRegion	243829	42743	38	2368	2406	6

$\textbf{APPENDIX I (cont'd) - Representation \ of Potential \ Climax \ Forest \ Types \ in \ Each \ Ecoregion }$

EcoRegion		roductive Fore	st Land	Selected	l For Old Fores	t Policy	Percent
	Potential Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Of Crown
	CIIMAN I/PC	(ha)	(ha)	(ha)	(ha)	(ha)	(%)
7 - Western	bS	79514	23660	7029	555	7584	32
/ - Western	bS, wP	384483	181945	40959	3383	44341	24
	rM	13386	6072	1839	136	1975	33
	rO, wP, rP	53193	32564	9542	900	10441	32
	rS, eH, wP	543907	131627	24811	1073	25884	20
	rs, en, wr rs, eH, wP, sM, yB, Be		13054	2367	333	2700	21
			4673		143		7
	sM, yB, Be Subtotal EcoRegion	51243 1280514	4673 393595	187 86734	6 521	329 93255	2 4
		65055	1.0000	2416	105	2612	0.0
3 - Atlantic Coastal	bS	67975	17992	3416	197	3613	20
	bS, bF	1453	616	77	0	77	13
	bs, rM	10819	4976	1742	0	1742	35
	bS, wP	56822	8274	711	226	938	11
	bS, wS	45567	13564	969	152	1121	8
	rM	1145	444	0	0	0	0
	rM, yB	25485	6912	797	127	924	13
	rS	4647	185	0	24	24	13
	rS, wP	91	0	0	0	0	0
	sM, yB, Be, rO	1827	71	0	8	8	12
	wS, bS, bF	58010	23669	2530	470	3000	13
	Subtotal EcoRegion	273840	76705	10242	1206	11448	15
9 - Fundy Shore	bS	1564	457	129	0	129	28
	bS, wP	1943	214	0	0	0	0
	rS	9427	148	37	0	37	25
	rS, eH	565	353	60	0	60	17
	rS, eH, wP	5803	1590	503	0	503	32
	rS, eH, wP, sM, yB, Be		250	15	11	26	10
	rS, sM, yB, Be	12849	408	96	0	96	23
	rS, wP	1508	73	23	0	23	32
	sM, yB, Be	68984	5229	924	108	1033	20
	Subtotal EcoRegion	111376	8721	1787	120	1907	22
Frand Total		4126159	1306768	176989	39722	216711	17

APPENDIX II - Representation of Potential Climax Forest Types in Each Ecodistrict

EcoDistrict		Productive For	rest Land	0	ld Forest Poli	су	Percent
	Potential					_	Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
100 Cape Breton Taiga	bF	1163	1163	181	0	181	16
	bS	1342	1338	280	0	280	21
	bS, bF	18258	18235	2516	0	2516	14
	Subtotal	20762	20736	2977	0	2977	14
10 Cape Breton Highlands	bF	101868	89549	7999	1697	9696	11
	bS	22688	21819	1207	1114	2321	11
	bS, bF	27888	24835	3982	213	4195	17
	sM, yB, Be	76781	56599	15484	1441	16924	30
	sM, yB, Be, eH, wP	2648	2262	348	47	395	17
	wS, bS, bF	1763	1023	0	17	17	2
	yB, bF	35776	29005	5032	510	5543	19
	Subtotal	269412	225092	34052	5039	39091	17
20 Victoria Lowlands	aE, sM, wA	330	22	0	0	0	0
	bS	89	45	3	0	3	6
	sM, yB, Be	37	6	0	0	0	0
	sM, yB, Be, rO	6287	1429	405	152	557	39
	wS, bS, bF	2766	461	155	18	173	38
	Subtotal	9509	1963	563	170	733	37
10 Cape Breton Hills	bS	846	329	0	19	19	6
	bS, bF	30337	14750	0	807	807	5
	bs, ws	3090	1075	1	46	47	4
	rS, eH, wP, sM, yB, E		35	0	0	0	0
	sM, yB, Be	179639	44126	1299	3264	4563	10
	sM, yB, Be, eH, wP	791	56	0	10	10	17
	wS, bS, bF	3133	432	7	1	8	2
	Subtotal	221149	60802	1307	4147	5453	9
320 Inverness Lowlands	aE, sM, wA	2340	178	17	0	17	10
	bS	7868	699	42	53	95	14
	bS, bF	201	7	2	0	2	22
	bs, ws	4518	571	0	0	0	0
	sM, yB, Be	8277	345	42	6	48	14
	sM, yB, Be, eH, wP	3114	314	9	35	44	14
	Subtotal	26318	2114	112	94	205	10

EcoDistrict	ELC Based	Productive For	rest Land	0	ld Forest Polic	СУ	Percent
	Potential						Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
330 Pictou Antigonish	aE, sM, wA	610	134	8	0	8	6
Highlands	bS	14652	5410	324	352	677	13
	rS	21585	7629	741	549	1290	17
	rS, eH	19593	3598	228	161	388	11
	rS, eH, sM, yB, Be	6102	1759	589	42	631	36
	rS, sM, yB, Be	14979	1853	0	79	79	4
	sM, yB, Be	41701	9710	782	550	1332	14
	Subtotal	119222	30093	2673	1732	4405	15
340 Cobequid Hills	bS	14896	3825	699	0	699	18
	rS	17383	3374	865	4	870	26
	rS, eH, sM, yB, Be	50707	10019	3236	18	3255	32
	sM, yB, Be	88050	13933	4524	36	4559	33
	Subtotal	171037	31151	9324	59	9383	30
350 Cobequid Slopes	aE, sM, wA	225	19	0	0	0	0
	bS	758	41	0	0	0	0
	bS, wP	15	8	0	0	0	0
	rS	11189	3969	0	946	946	24
	rS, eH, wP, sM, yB, 1	3e 1273	382	1	0	1	0
	rS, sM, yB, Be	18245	4382	841	30	871	20
	Subtotal	31705	8800	842	976	1818	21
360 Mulgrave Plateau	aE, sM, wA	696	259	0	2	2	1
	bS	20723	10066	868	126	994	10
	rM, yB	17603	8064	0	74	74	1
	rS, eH	161	46	0	0	0	0
	sM, yB	42917	14135	2273	384	2657	19
	Subtotal	82099	32569	3142	586	3727	11
370 St.Mary's River	aE, sM, wA	1158	290	0	11	11	4
	bS	4820	2269	0	123	123	5
	bS, wP	35617	26913	101	1270	1371	5
	rS	10053	5023	0	467	467	9
	sM, yB	4388	1586	0	106	106	7
	sM, yB, Be	14127	8096	0	257	257	3
	Subtotal	70164	44178	101	2235	2336	5

EcoDistrict	ELC Based	Productive Fo	rest Land	0	ld Forest Polic	су	Percent
	Potential						Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
380 Central Uplands	aE, sM, wA	1400	172	2	15	17	10
	bS	12890	2410	7	66	73	3
	bS, wP	5135	1040	0	70	70	7
	rS	27813	5318	7	172	180	3
	rS, eH	759	32	0	0	0	0
	rS, eH, wP	1805	97	3	2	5	5
	rS, eH, wP, sM, yP	B, Be 522	144	0	79	79	55
	rS, eH, yB	15979	2103	31	205	236	11
	sM, yB, Be	23371	2814	0	48	48	2
	sM, yB, rS	22782	3608	9	229	239	7
	Subtotal	112456	17738	60	886	946	5
410 Rawdon\Wittenburg	bS	901	51	0	6	6	12
	rS	10941	766	0	22	22	3
	rS, eH	2982	38	0	13	13	35
	rS, eH, wP, sM, yF	3, Be 12890	160	0	40	40	25
	rS, sM, yB, Be	5314	356	0	42	42	12
	rS, wP	88	0	0	0	0	0
	sM, yB, Be	19233	329	0	91	91	28
	Subtotal	52350	1700	0	215	215	13
420 Eastern Drumlins	bS	35084	17673	1145	644	1789	10
	rS	631	170	0	0	0	0
	rS, wP	4573	1687	68	30	97	6
	sM, yB, Be	24463	10479	562	23	585	6
	Subtotal	64750	30009	1775	696	2471	8
430 Eastern Granite Upl	ands bS	8721	6168	2624	17	2641	43
	bS, wP	5611	4076	1875	2	1877	46
	rS	25466	18070	7448	38	7486	41
	rS, wP	5033	3781	1870	2	1872	50
	sM, yB, Be	933	557	47	0	47	8
	Subtotal	45763	32651	13864	60	13923	43
440 Eastern Interior	aE, sM, wA	2945	1621	79	43	121	7
	bS	94138	46162	1288	1513	2801	6
	bS, wP	43158	27705	1671	1418	3089	11
	rS, sM, yB, Be	79582	36079	1024	1092	2115	6
	rS, wP	32168	12566	222	177	399	3
	sM, yB	769	95	0	0	0	0
	sM, yB, Be	15664	7198	160	604	763	11
	Subtotal	268423	131427	4442	4847	9289	7

EcoDistrict	ELC Based	Productive Fo	rest Land	0	ld Forest Polic	су	Percent
	Potential						Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
450 Governor Lake	bS	2972	660	0	23	23	4
	bS, wP	9375	2156	0	183	183	8
	rS	19171	4339	0	235	235	5
	rS, eH	9258	1086	0	182	182	17
	sM, yB, Be	12119	2728	0	204	204	7
	Subtotal	52895	10969	0	827	827	8
510 Bras d'Or Lowlands	aE, sM, wA	948	158	3	7	10	6
	bS	9201	1861	168	98	266	14
	bS, wP	84108	19168	1594	1115	2709	14
	sM, yB, Be	94546	19857	1083	833	1917	10
	sM, yB, Be, eH, w	P 8679	1119	0	100	100	9
	Subtotal	197482	42164	2848	2153	5001	12
520 St.Georges Bay	aE, sM, wA	2355	111	0	2	2	2
	bS	12804	910	11	82	93	10
	bS, wP	11029	409	29	79	108	26
	rS, eH, sM, yB, Be	e 2821	227	0	8	8	4
	sM, yB, Be	31111	2403	0	168	168	7
	Subtotal	60120	4059	40	339	379	9
530 Northumberland Lowland		2087	295	0	7	7	2
	bS	22115	1942	2	87	89	5
	bS, wP	75569	6774	4	514	518	8
	jP, bS, wP	10555	555	0	3	3	0
	rS	64002	4153	3	378	381	9
	rS, eH, sM, yB, Be		0	0	0	0	0
	rS, eH, wP	1206	72	0	0	0	0
	rS, sM, yB, Be	21783	968	0	20	20	2
	Subtotal	197360	14760	8	1009	1017	7
540 Cumberland Hills	aE, sM, wA	799	135	0	36	36	27
	bS	14264	3706	0	460	460	12
	rS	4577	403	0	77	77	19
	rS, eH	12702	1615	1	75	76	5
	rS, eH, wP	13011	1676	32	146	178	11
	sM, yB, Be	29586	4281	12	285	298	7
	Subtotal	74940	11815	46	1081	1126	10
550 Cumberland Marshes	bS	3073	343	0	9	9	3
	rS	1889	75	0	7	7	9
	rS, sM, yB, Be	59	0	0	0	0	0
	Subtotal	5020	418	0	16	16	4

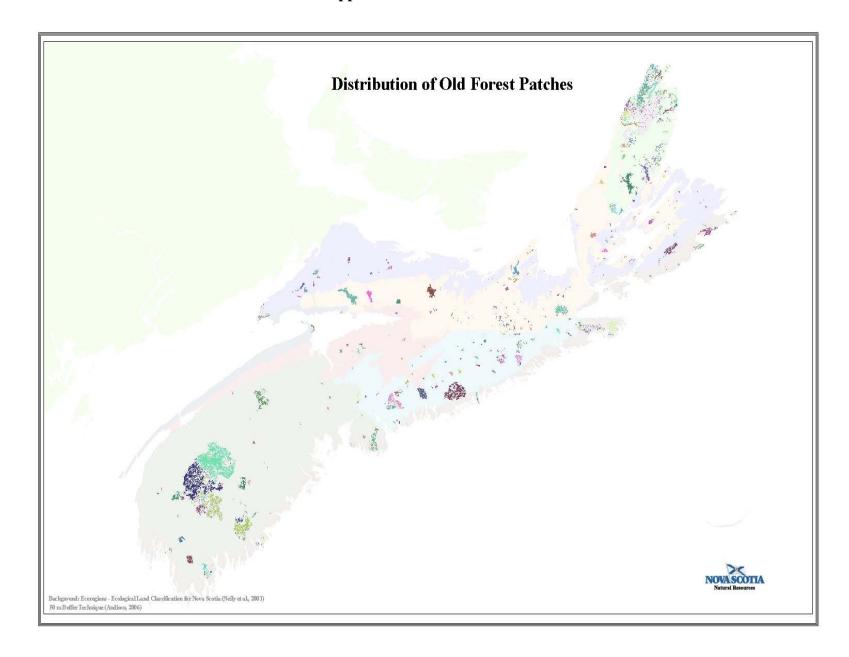
EcoDistrict	ELC Based	roductive Fo	rest Land	0	ld Forest Polic	cy	Percent
	Potential						Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
560 Chignecto Ridges	aE, sM, wA	536	125	0	58	58	46
	bS	21766	9877	4	1052	1056	11
	bS, wP	5133	2687	0	0	0	0
	jP, bS, wP	10623	5430	0	286	286	5
	rS	24227	10455	8	943	952	9
	rS, eH, wP, sM, yB, Be	34	25	0	0	0	0
	rS, sM, yB, Be	505	363	0	0	0	0
	sM, yB, Be	840	835	0	2	2	0
	Subtotal	63663	29796	12	2341	2353	8
610 Annapolis Valley	aE, sM, wA	1410	12	0	0	0	0
	bS	5736	161	0	0	0	0
	bS, wP	12	0	0	0	0	0
	rO, wP, rP	9930	957	0	0	0	0
	rS, eH, wP	11296	251	1	0	1	0
	sM, yB, Be	1381	50	0	0	0	0
	Subtotal	29764	1431	1	0	1	0
620 Minas Lowlands	aE, sM, wA	1714	389	2	74	75	19
	bS	3310	320	0	0	0	0
	bS, wP	6119	614	0	82	82	13
	rS	68	0	0	0	0	0
	rS, eH	5868	333	0	15	15	4
	rS, eH, wP	1315	49	4	0	4	8
	rS, eH, wP, sM, yB, Be	85	12	0	0	0	0
	rS, sM, yB, Be	808	136	0	0	0	0
	sM, yB, Be	243	30	0	0	0	0
	Subtotal	19529	1883	6	171	177	9
630 Central Lowlands	aE, sM, wA	5447	628	5	49	54	9
	bS	36753	7427	11	484	496	7
	bS, wP	10723	4041	0	165	165	4
	rP, bS, wP	22976	13847	0	704	704	5
	rS	51953	6886	15	465	480	7
	rS, eH	7240	656	0	102	102	16
	rS, eH, wP	171	0	0	0	0	0
	rS, eH, yB	33787	2848	0	133	133	5
	sM, yB, Be	12064	979	0	68	68	7
	sM, yB, rS	13421	2117	0	26	26	1
	Subtotal	194536	39428	31	2198	2229	6

EcoDistrict	ELC Based	Productive For	rest Land	0	ld Forest Poli	су	Percent
	Potential						Of
	Climax Type	All Owners	Crown	Reserve	Non-Reserve	Total	Crown
		(ha)	(ha)	(ha)	(ha)	(ha)	(%)
710 Valley Slope	bS	935	3	0	0	0	0
	rO, wP, rP	172	0	0	0	0	0
	rS, eH, wP	46973	1409	69	0	69	5
	rS, eH, wP, sM, yB,	Be 4841	89	0	0	0	0
	sM, yB, Be	15227	601	0	112	112	19
	Subtotal	68149	2102	69	112	181	9
720 South Mountain	bS	22660	8976	5518	0	5518	61
	bS, wP	137816	46545	12247	241	12488	27
	rM	4270	1620	940	0	940	58
	rO, wP, rP	20390	6241	1079	49	1129	18
	rS, eH, wP	179320	59218	14085	203	14288	24
	rS, eH, wP, sM, yB,	Be 12751	1201	172	0	172	14
	sM, yB, Be	3017	729	28	0	28	4
	Subtotal	380224	124531	34070	493	34563	28
730 Clare	bS	31146	5232	1225	51	1276	24
	bS, wP	340	80	59	0	59	74
	rM	738	82	5	0	5	6
	rO, wP, rP	542	155	0	0	0	0
	rS, eH, wP	39557	4337	246	41	286	7
	rS, eH, wP, sM, yB,	Be 42212	2437	117	123	240	10
	sM, yB, Be	26827	2907	159	30	189	7
	Subtotal	141363	15229	1811	245	2055	13
740 LaHave Drumlins	bS	6608	610	0	0	0	0
	bS, wP	26497	5585	1105	1	1105	20
	rM	729	218	0	0	0	0
	rO, wP, rP	2998	1321	0	0	0	0
	rS, eH, wP	77594	15845	4932	298	5230	33
	rS, eH, wP, sM, yB,	Be 83952	6899	1777	21	1798	26
	sM, yB, Be	6061	415	0	0	0	0
	Subtotal	204439	30893	7814	319	8133	26
750 Rossignol	bS, wP	21506	5465	2414	0	2414	44
	rS, eH, wP	58652	11759	3899	12	3911	33
	rS, eH, wP, sM, yB,	Be 2060	170	23	0	23	13
	Subtotal	82218	17393	6336	12	6348	36

EcoDistrict	ELC Based	Productive Forest Land		Old Forest Policy			Percent
	Potential		Crown (ha)	Reserve (ha)	Non-Reserve (ha)	Total (ha)	Of Crown (%)
	Climax Type	All Owners (ha)					
760 Sable	bS	11912	7481	285	470	755	10
	bS, wP	150923	93941	9564	2739	12303	13
	rM	6957	3490	407	136	542	16
	rO, wP, rP	8438	5063	0	838	838	17
	rS, eH, wP	30479	15502	764	9	773	5
	rS, eH, wP, sM, yB, H	Be 2642	499	38	0	38	8
	Subtotal	211351	125977	11058	4191	15249	12
770 Western Barrens	bS, wP	25647	25177	14805	0	14805	59
	rM	692	662	487	0	487	74
	rO, wP, rP	20653	19784	8463	12	8475	43
	Subtotal	46992	45622	23755	12	23767	52
780 St.Margaret's Bay	bS	6251	1358	0	35	35	3
	bS, wP	21754	5151	765	401	1166	23
	rS, eH, wP	111332	23557	816	511	1327	6
	rS, eH, wP, sM, yB, H	Be 6330	1760	239	190	429	24
	sM, yB, Be	111	22	0	0	0	0
	Subtotal	145778	31848	1820	1137	2957	9
810 Cape Breton Coastal	bS	2220	1246	181	23	204	16
	bs, ws	2893	348	0	29	29	8
	rM	262	26	0	0	0	0
	rM, yB	17431	5657	317	127	444	8
	wS, bS, bF	58010	23669	2530	470	3000	13
	Subtotal	80815	30946	3028	649	3677	12
820 Eastern Shore	bS	34250	12521	2378	0	2378	19
	bS, bF	1453	616	77	0	77	13
	bS, rM	10819	4976	1742	0	1742	35
	bs, ws	36876	12647	969	0	969	8
	rM, yB	8054	1255	480	0	480	38
	Subtotal	91452	32015	5646	0	5646	18
830 South Shore	bS	22234	3358	857	11	867	26
	bS, wP	56822	8274	711	226	938	11
	bS, wS	749	52	0	0	0	0
	rM	884	418	0	0	0	0
	Subtotal	80689	12102	1568	237	1805	15

EcoDistrict	ELC Based Potential	Productive Forest Land		Old Forest Policy			Percent Of
	Climax Type	All Owners (ha)	Crown (ha)	Reserve (ha)	Non-Reserve (ha)	Total (ha)	Crown
bS, wS	5048	517	0	123	123	24	
rS	4647	185	0	24	24	13	
rS, wP	91	0	0	0	0	0	
sM, yB, Be, rO	1827	71	0	8	8	12	
Subtotal	20884	1641	0	320	320	20	
910 Parrsboro Shore	bS	1461	457	129	0	129	28
	bS, wP	1943	214	0	0	0	0
	rS	4685	103	0	0	0	0
	rS, eH	565	353	60	0	60	17
	rS, eH, wP	5044	1566	503	0	503	32
	rS, sM, yB, Be	12745	402	96	0	96	24
	rS, wP	1508	73	23	0	23	32
	sM, yB, Be	5086	3174	543	0	543	17
	Subtotal	33037	6342	1354	0	1354	21
920 North Mountain	bS	103	0	0	0	0	0
	rS	4741	45	37	0	37	83
	rS, eH, wP	759	24	0	0	0	0
	rS, eH, wP, sM, yB, E	3e 8733	250	15	11	26	10
	rS, sM, yB, Be	104	5	0	0	0	0
	sM, yB, Be	63898	2055	381	108	489	24
	Subtotal	78339	2379	433	120	552	23
Grand Total		4126159	1306768	176989	39722	216711	17

APPENDIX III - Mapped Distribution of Old Forest Patches



^{*} Colors distinguish individual old forest patches and do not represent any type of classification.