ESTIMATE OF VOLUMES

T.6 R.9 W.E.L.S. & T.6 R.10 W.E.L.S.

BAXTER STATE PARK

PISCATAQUIS COUNTY, MAINE

1971

FOREWORD: This report has been prepared by James W. Sewall Company for the Baxter State Park Authority, and was authorized by Austin H. Wilkins, Forest Commissioner in a letter dated July 28, 1971, requesting a forest inventory complete with density classes, volumes, and other data useful in setting up a management project.

AREA IN ACRES (4)

	T.6 R.9	T.6 R.10	Total
FOREST LAND	20,722	23,442	44,164
Softwood	8,171	15,865	24,036
S3B	970	3,035	4,005
S2A	6,304	12,155	18,459
S2B	773	358	1,131
S2B II	11	-	11
S2BS	97	317	414
S1A	8	-	8
S1A II	8	-	8
Mixedwood	6,641	6,504	13,145
SH3B	615	966	1,581
SH2A	1,901	3,215	5,116
SH2B	1,414	399	1,813
SH2B II	34	-	34
HS3B	-	34	34
HS2A	238	387	625
HS2B	1,410	1,309	2,719
HS1A	704	171	875
HS1A II	325	23	348
Hardwood	5,910	1,073	6,983
H2A	1,261	90	1,351
H2B	3,183	949	4,132
H2BS	23	-	23
H1A	783	34	817
H1A II	660	-	660
NON-FOREST	676	226	902
Water & Wetland	3,508	1,336	4,844
TOTAL	24,906	25,004	49,910

SPECIES ESTIMATE

T.6 R.9 20,722
T.6 R.10 23,442

44,164 Forest Acres

	T.6 R. 9	T.6 R.10	Total
Cordwood - Rough Cords 1/			
Spruce	100,658	193,581	294,239
Fir	64,928	117,174	182,102
Total Spruce & Fir	165,586	310,755	476,341
Hemlock	3,504	6,441	9,945
Cedar	48,206	86,599	134,805
Total Softwood Cordwood	217,296	403,795	621,091
Hardwood Pulpwood	84,318	66,781	151,099
Boltwood 2/	7,702	6,599	14,301
Total Hardwood Cordwood	92,020	73,380	165,400
Logs - MBF			
Softwood 3/	4,175	5,606	9,781
Hardwood 4/	2,908	3,838	6,746
Total Logs	7,083	9,444	16,527

1/ 128 cubic feet stacked, 6" D.B.H. & Up; 4" Top
2/ 8"-11" D.B.H.; 6" Top
3/ Int. 1/4" Log Rule; Top D.I.B. 6"
4/ Int. 1/4" Log Rule; Top D.I.B. 10"

STOCK TABLES FOR T6R9 & T6R10 WELS - (1)

TYPE	AREA	SPRUCE	FIR	HEMLOCK	CEDAR	H. PULP	BOLT-WOOD	HARD LOGS	SOFT LOGS
(117) S3B	970	15.038	5.265	0.591	3.739	1.856	0.184	170	248
		14587	5107	573	3627	1800	178	165M	241M
(218) S2A	6,304	9.606	6.635	0.214	4.988	1.246	0.129	77	214
		60556	41827	1349	31444	7855	813	485M	1349M
(46) S2B	773	2.476	2.265	0.111	4.317	2.280	0.300	123	57
		1914	1751	86	3337	1762	232	95M	44M
S2BII 4/	11	1.651	1.510	0.074	2.878	1.520	0.200	82	38
		18	17	1	32	17	2	1M	--
(65) S2BS 1/	97	3.180	1.202	0.042	7.502	0.795	0.037	31	--
		308	117	4	728	77	4	3M	--
(17) S1A 2/	8	1.728	0.984	--	1.882	2.050	1.399	90	--
		14	8	--	15	16	11	1M	--
S1AII 4/	8	1.152	0.656	--	1.255	1.367	0.933	60	--
		9	5	--	10	11	7	--	--
(142) SH3B	615	9.319	4.855	0.972	1.633	6.008	0.669	610	109
		5731	2986	598	1004	3695	411	375M	67M
(42) SH2A	1,901	5.028	3.831	--	2.541	5.794	0.829	345	103
		9558	7283	--	4830	11014	1576	656M	196M
(22) SH2B	1,414	1.956	0.876	--	0.722	4.217	0.317	184	74
		2766	1239	--	1021	5963	448	260M	105M
SH2BII 4/	34	1.304	0.584	--	0.481	2.811	0.211	123	49
		44	20	--	16	96	7	4M	2M
(141) HS3B	--	5.279	2.716	0.418	0.880	8.537	0.568	1345	144
		--	--	--	--	--	--	--	--
(19) HS2A 3/	238	3.186	0.542	2.222	0.075	8.782	--	751	103
		758	129	529	18	2090	--	179M	25M
(33) HS2B 3/	1,410	1.108	0.839	0.120	0.188	5.190	0.142	123	1309
		1562	1183	169	265	7318	200	173M	1846M
(9) HS1A 3/	704	1.434	2.417	--	1.896	4.579	0.264	--	--
		1010	1702	--	1335	3224	186	--	--
HS1AII 4/	325	0.956	1.611	--	1.264	3.053	0.176	--	--
		311	524	--	411	992	57	--	--
(27) H2A 3/	1,261	0.741	0.415	0.114	0.068	11.271	1.255	127	--
		934	523	144	86	14213	1583	160	--
(140) H2B 3/	3,183	0.148	0.113	0.016	--	6.741	0.575	50	--
		471	360	51	--	21457	1830	159M	--
H2BS 4/	23	0.099	0.075	0.011	--	4.494	0.383	33	--
		2	2	--	--	103	9	1M	--
(66) H1A 3/	783	0.085	0.119	--	0.022	2.138	0.121	156	245
		67	93	--	17	1674	95	122M	192M
H1AII 4/	660	0.057	0.079	--	0.015	1.425	0.081	104	163
		38	52	--	10	941	53	69M	108M
TOTALS	20,722	100,658	64,928	3,504	48,206	84,318	7,702	2,908M	4,175M

1/ Use CS2B Area I, N. Pisc.

2/ Use "Type" Area I, N. Pisc.

3/ Use "Type" Area III, S. Pisc.

4/ Use 2/3 V/A of normal site stand

Numbers in parenthesis indicate number of sample points.
Basic source data Area IV, N. Pisc. County Stock Table.

STOCK TABLES FOR T6R9 & T6R10 WELS - (1)

TYPE	AREA	SPRUCE	FIR	HEMLOCK	CEDAR	H. PULP	BOLT-WOOD	HARD LOGS	SOFT LOGS
(117) S3B	3,035	15.038 45640	5.265 15979	0.591 1794	3.739 11348	1.856 5633	0.184 558	170 516M	248 753M
(218) S2A	12,155	9.606 116761	6.635 80648	0.214 2601	4.988 60629	1.246 15145	0.129 1568	77 936M	214 2601M
(46) S2B	358	2.476 886	2.265 811	0.111 38	4.317 1545	2.280 816	0.300 107	123 44M	57 20M
4/ S2BII	--	1.651 --	1.510 --	0.074 --	2.878 --	1.520 --	0.200 --	82 --	38 --
(65) 1/ S2BS	317	3.180 1008	1.202 381	0.042 13	7.502 2378	0.795 252	0.037 12	31 10M	-- --
(17) 2/ S1A	--	1.728 --	0.984 --	-- --	1.882 --	2.050 --	1.399 --	90 --	-- --
4/ S1AII	--	1.152 --	0.656 --	-- --	1.255 --	1.367 --	0.933 --	60 --	-- --
(142) SH3B	966	9.319 9002	4.855 4690	0.972 939	1.633 1577	6.008 5804	0.669 646	610 589M	109 105M
(42) SH2A	3,215	5.028 16165	3.831 12317	-- --	2.541 8169	5.794 18628	0.829 2665	345 1109M	103 331M
(22) SH2B	399	1.956 780	0.876 350	-- --	0.722 288	4.217 1683	0.317 126	184 73M	74 30M
4/ SH2BII	--	1.304 --	0.584 --	-- --	0.481 --	2.811 --	0.211 --	123 --	49 --
(141) HS3B	34	5.279 179	2.716 92	0.418 14	0.880 30	8.537 290	0.568 19	1345 46M	144 5M
(19) 3/ HS2A	387	3.186 1233	0.542 210	2.222 860	0.075 29	8.782 3399	-- --	751 291M	103 40M
(33) 3/ HS2B	1,309	1.108 1450	0.839 1098	0.120 157	0.188 246	5.190 6794	0.142 186	123 161M	1309 1713M
(9) 3/ HS1A	171	1.434 245	2.417 413	-- --	1.896 324	4.579 783	0.264 45	-- --	-- --
4/ HS1AII	23	0.956 22	1.611 37	-- --	1.264 29	3.053 70	0.176 4	-- --	-- --
(27) 3/ H2A	90	0.741 67	0.415 37	0.114 10	0.068 6	11.271 1014	1.255 113	127 11M	-- --
(140) 3/ H2B	949	0.148 140	0.113 107	0.016 15	-- --	6.741 6397	0.575 546	50 47M	-- --
4/ H2BS	--	0.099 --	0.075 --	0.011 --	-- --	4.494 --	0.383 --	33 --	-- --
(66) 3/ H1A	34	0.085 3	0.119 4	-- --	0.022 1	2.138 73	0.121 4	156 5M	245 8
4/ H1AII	--	0.057 --	0.079 --	-- --	0.015 --	1.425 --	0.081 --	104 --	163 --
TOTALS	23,442	193,581	117,174	6,441	86,599	66,781	6,599	3,838M	5,60

1/ Use CS2B Area I, N. Pisc.

2/ Use "Type" Area I, N. Pisc.

3/ Use "Type" Area II, S. Pisc.

4/ Use 2/3 V/A of normal site stand

Numbers in parenthesis indicate number of sample points.
Basic source, data Area IV, N. Pisc. County Stock Table.

LOCATION: These two townships are located within Piscataquis County and form the northern boundary of Baxter State Park. They are adjacent to each other, with T. 6 R. 9 W.E.L.S. the most easterly. This town also borders on the Penobscot County line.

BOUNDARY LINES: Exterior boundary lines, where they form the limits of the Park, are in good condition. These exterior lines were run by the Maine Forest Service during the winter of 1970-1971.

PLANS: No plan of the area accompanies this report; however a forest type map of the entire Park was compiled early in 1971 for the Department of Inland Fisheries and Game by James W. Sewall Company (4). This map forms the basis of this report on estimated volumes.

TOPOGRAPHY: The terrain is typified as being fairly flat country, broken by low lying ridges and several streams, except in the south part, which rises to some of the lower mountains of Baxter State Park. With the exception of limited steep areas, most of the forested land has been cut over for either logs or pulpwood.

TRANSPORTATION: Water was the earliest mode of transportation in the area and was a critical factor in the economic development of the state and particularly the Bangor Area. Webster Lake, which lies across the west boundary of T. 6 R. 10, formed part of the link between the Penobscot and Allagash headwaters. The so-called Telos Canal connected these two rivers and the area was made famous in the bloodless Telos War.

Presently a gravel road passes across both towns on a generally east to west course. Patten is the nearest town of size; however, access from Millinocket and Greenville can be made from the south over connecting logging roads.

FOREST TYPES:

According to a 1971 mapping and land classification study of Baxter State Park(4), there are 49,910 acres of Park area within the two towns, T.6 R.9 and T.6 R.10 W.E.L.S. (an additional 25 acres on T.6 R. 10 forms a dam lot on Webster Lake and is the only alienated property). This is divided as follows into three major categories:

1. Forest Land	88%
2. Non-Forest Land	2%
3. Water & Wetland	10%

The stated acreage of forest land, amounting to 44,164 acres, is further identified as being comprised of softwood, mixedwood, or hardwood types. These subdivisions are 54 percent, 30 percent, and 16 percent respectively.

Softwood land area of 24,036 acres has been delineated on aerial photographs into seven major softwood types which best describe the type of forest and conditions occurring on the ground. All softwood types are described as being 93 percent softwood in character. The two types S3B and S2A (16 percent and 77 percent respectively) are the major components of the softwood types; however, assuming that the normal tendency is towards conservatism in classifying volumes - particularly without the advantage of ground control - the possibility arises that the majority of the softwood land area may support stands close to being mature or over mature. This may dictate special considerations - particularly in the area of protection.

The 30 percent mixedwood land, involving some 13,145 acres, tends to be more softwood in character than hardwood - 65 percent of this area is classified as predominately softwood. Overall, softwood volumes (all species) make up 58 percent of the total volume.

The mature and over-mature types involve approximately 55 percent of the mixedwood land area and without cutting or some natural stand removal will increase as a percentage of the total mixedwood area.

The remaining hardwood land, 6,983 acres, is essentially made up of second growth stands. Records, on file at James W. Sewall Company(5), indicate that much of this hardwood land resulted from a burn in 1903, and a substantial portion of this land on T.6 R. 9 W.E.L.S. was planted to Spruce during the period 1917 to 1924; this estimate indicates however, that only 7 percent of the volumes present on hardwood land are softwood species. These records also show that a cutting operation was centered in the north one-third of T.6 R. 9 about 1941.

Some estimate of forest growth may become useful in the management of this land and the following is supplied, derived from Safford's report(3). Growth rates have been converted to cords based on 85 cubic feet per rough cord.

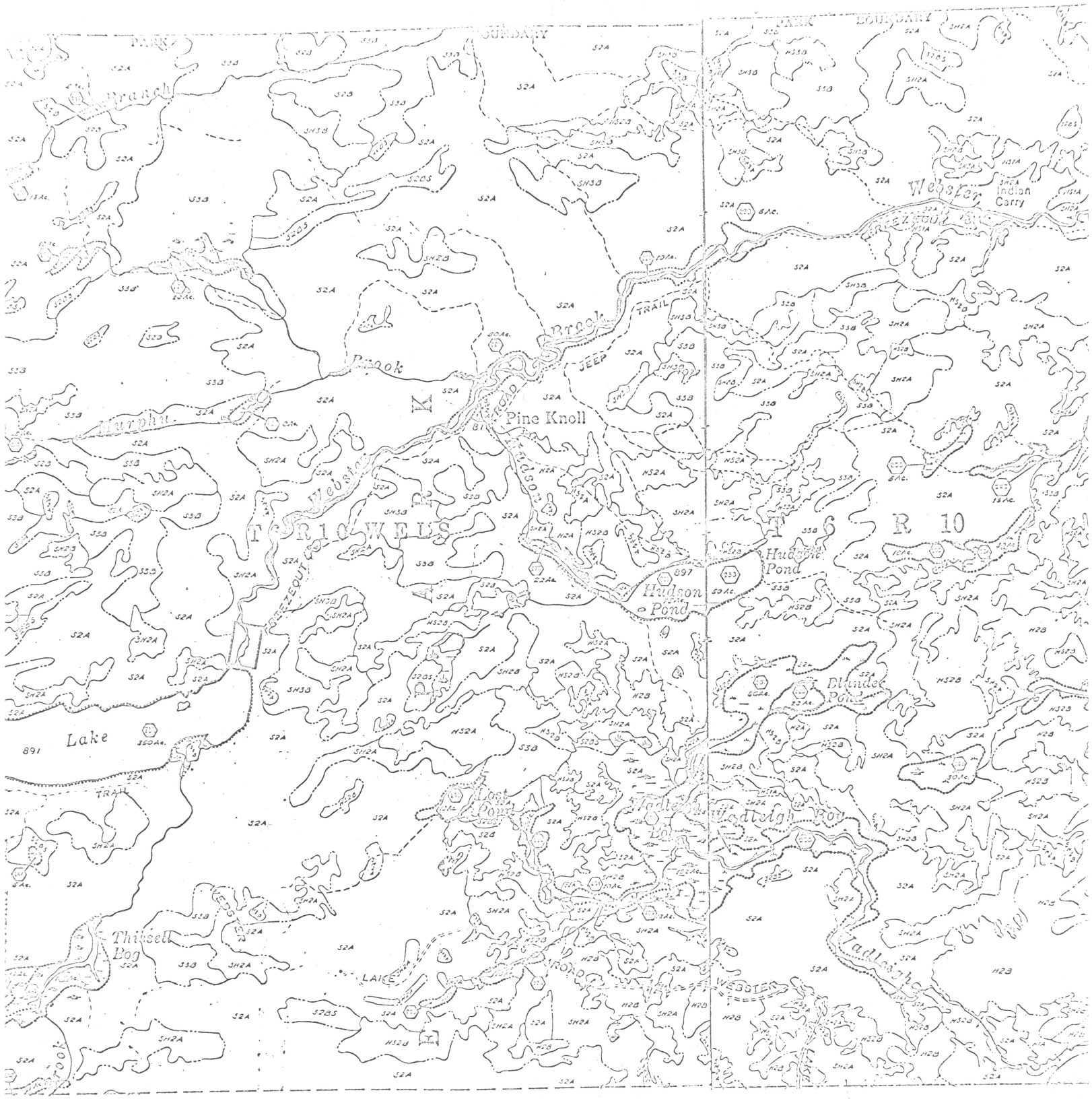
GROWTH ON:	CAY Gross Merch.
Softwood Land	.61
Mixedwood Land	.49
Hardwood Land	.28
All Forest Land	.52

These rates are slightly higher than regional and state averages; however, it would appear that this is the "best" available estimate of current periodic growth. They should, however, be used with "caution and judgment" since they were derived from stands and conditions measured during the period 1954-1964.

This same method, applied to seventy-six townships in Piscataquis County(1), agrees very closely with the overall growth rate for the entire area in Safford's report, which in turn also agrees with figures released by the U.S. Forest Service (to appear in the forthcoming report on the Timber Resources of Maine(6). It would appear then, that they offer a basis for reasonably sound decision making.

PLANTED 1917 - 1924

Scale(4): 1" = 4000'



Scale(4): 1" = 4000'

SPECIES:

Individual species volumes as shown on the accompanying Species Estimate Table, are for gross merchantable units before discount. Conversion of MBF to Cords at the rate of two cords per thousand board feet, indicates that approximately 78 percent of the total volume is made up of softwood species and 22 percent hardwood.

The sawlog estimate is split, 59 percent softwood and 41 percent hardwood. The softwood species included in the estimate are primarily White Pine with only a small amount of Red Pine, and the hardwood species are Hard Maple and Yellow Birch.

Spruce and Fir are by far the predominant species in the softwood group and in combined total, account for 74 percent of the coniferous volume. In this case the predominant species - Spruce - makes up 62 percent of the volume.

Cedar is the next most prevalent species - nearly equaling Fir - and accounts for 21 percent of the total softwood volume. Hemlock and the two Pine species comprise the remaining 5 percent of the softwood, with the ratio of Pine to Hemlock about two to one.

Hardwood boltwood and logs contribute approximately 16 percent to the overall hardwood volume, with boltwood made up of White Birch, Yellow Birch and Hard Maple. This part of the high quality hardwood estimate amounts to 51 percent. The remaining hardwood includes all species suitable for hardwood pulpwood and accounts for the bulk of the hardwood volume - 84 percent.

Since these estimates have been derived from data collected outside the immediate area (see Method of Estimate) and no on-site evaluation of

stand conditions was conducted, no attempt has been made to apply any discount to individual species volumes. Experience on surrounding timberlands of similar structure and age indicates the Fir should be discounted in the neighborhood of 15 to 20 percent - depending upon age - and remaining species about 10 percent. Without specific studies these figures should provide reasonable estimates of net merchantable volume for a large area such as this. As age of these stands continues to increase, these figures, in all likelihood, should be revised upward.

VOLUME TABLES

The accompanying volume table is the same as used in the report to the State Bureau of Taxation(1). Volumes are in gross, merchantable units (before discount) and were derived from Honer's Tables(2) for height data collected within and immediately surrounding the area cruised for the Bureau of Taxation.

VOLUME TABLE(1,2)

GROSS UNITS

	Rough Cords[1]							Board Feet	
D.B.H.	Spruce	Spruce Site II	Fir	Fir Site II	Cedar	Hemlock	Hwd. Pulp[2]	W.Pine Logs[3]	Hwd. Logs[4]
6	.033	.016	.033	.015	.024	.028	.035		
7	.055	.036	.044	.035	.038	.045	.051		
8	.082	.056	.065	.054	.055	.071	.084	23	
9	.112	.081	.107	.077	.075	.102	.113	40	
10	.148	.113	.140	.107	.096	.140	.144	60	
11	.187	.141	.176	.133	.123	.178	.182	81	15
12	.232	.169	.217	.160	.152	.223	.222	106	39
13	.283	.206	.262	.196	.188	.273	.266	132	65
14	.335	.252	.313	.233	.229	.326	.314	161	91
15	.401	.296	.367		.275	.388	.367	193	119
16	.458	.340	.427		.320	.454	.424	227	149
18	.607	.442			.411	.604	.560	303	215
20	.778				.464	.772	.702	393	289
22	.964						.915	498	372
24								619	460
26								755	
28								908	
30								1077	

1/Cords rough wood, 128 cubic feet stacked, top D.I.B. 4 inches
2/Use for boltwood species - 8" through 11"
3/Int. 1/4" Log Rule: stump height = 0.5'. top D.I.B. 6 inches
4/Int. 1/4" Log Rule: stump height = 0.5', top D.I.B. 10 inches

METHOD OF ESTIMATE: Per acre volume estimates were obtained from cruise data supplied by the State Bureau of Taxation(1). These estimates have been applied to type acreages obtained from vegetative type maps prepared by James W. Sewall Company for the Department of Inland Fisheries and Game (4).

While we do not guarantee any estimate it is believed that these are closely correlated with conditions on these two townships. Use of these figures should be made with the full knowledge of the conditions and means under which they were compiled and that no part of the basic cruise data was taken from the immediate area covered in this study.

Respectfully submitted,

JAMES W. SEWALL COMPANY

By _____
Robert B. Fiske
Forester

December 14, 1971

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3. Safford, L.O. 1968. Ten-year average growth rates in the Spruce-Fir region of northern New England, U.S.F.S. Res. Pap. NE-93.

4. Sewall Co., 1971. Baxter State Park - Piscataquis and Penobscot County, Maine. Map by J.W.S. Co. for Maine Dept. Inld. Fish. and Game. Area data also included in project. On file with agency and J.W.S. Co.

5. _____Forest type maps as explored 1940 - 1942 by J.W.S. Co.

6. U.S.F.S. Timber resources of Maine (to be released early 1972 by Northeastern Forest Exp. Sta.