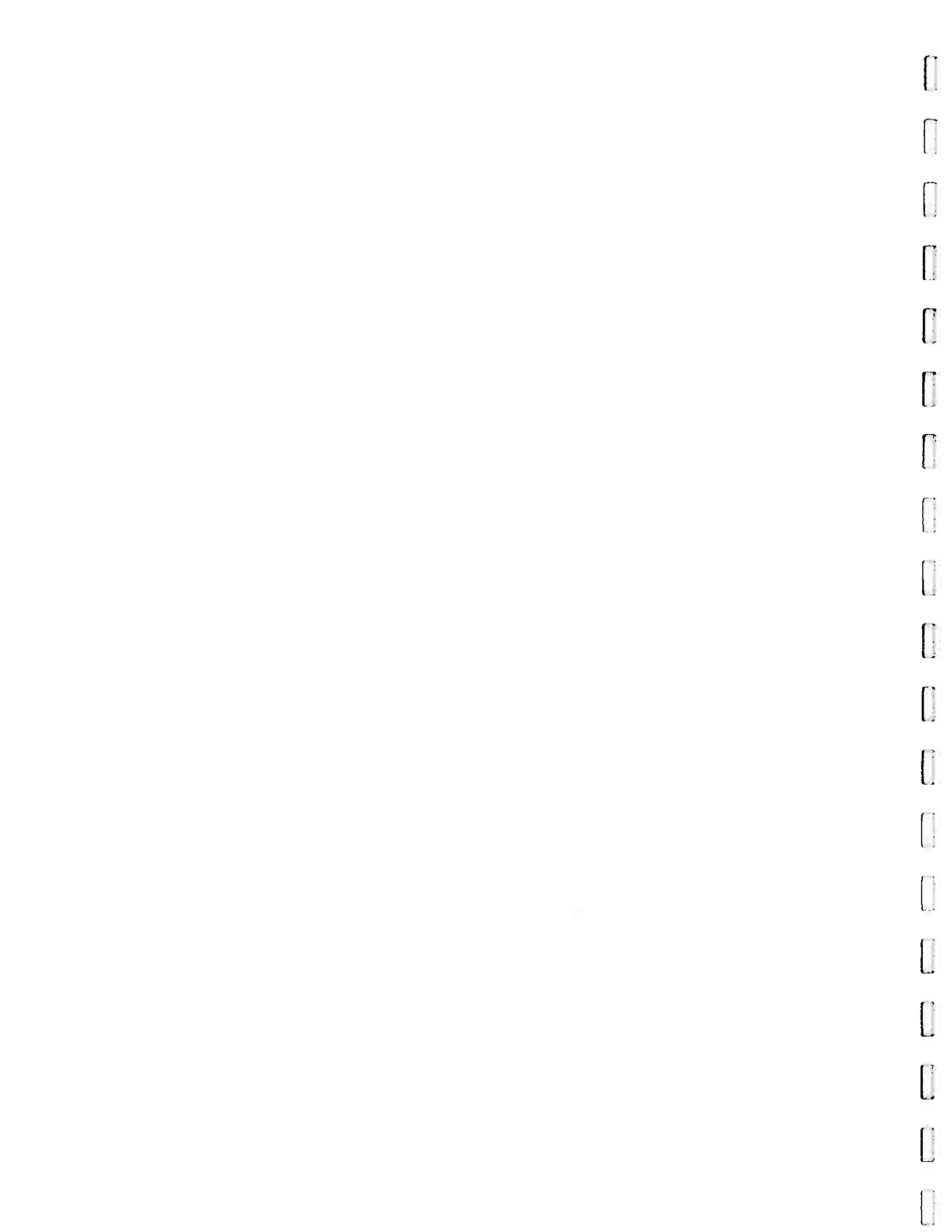


FOREST RESOURCES  
DOT LAKE VILLAGE/TANANA RIVER WATERSHED  
ALASKA, 1998

TANANA CHIEFS CONFERENCE, INC.  
FAIRBANKS, ALASKA

Will Mayo  
President



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## INVENTORY HIGHLIGHTS

### Forest Resources of Dot Lake Village Lands

	<u>Acres</u>
Dot Lake Project Area Land Classification:	
Timberlands	36,440
Woodlands	13,213
Non-forest	<u>21,917</u>
Total Inventory Area:	71,570
Timberland Area by Timber Type Size Class:	
Sawtimber	4,980
Poletimber	16,257
Reproduction	<u>15,203</u>
Total Timberland Area:	36,440
Timberland Area by Timber Type Species:	
White Spruce Type	10,052
Hardwood Type	23,145
Mixed White Spruce/Hardwood Type	2,930
Cottonwood Type	<u>313</u>
Total Timberland Area	36,440

#### Timberland Volume:

	<u>Cubic Feet *</u>	<u>Board Feet **</u>
Total Net Volume	47,476,712	72,537,964

\* Includes all size classes 1.0" dbh and greater within sawtimber and poletimber types.

\*\* Includes only sawtimber trees 9.5" dbh and greater within sawtimber and poletimber types.

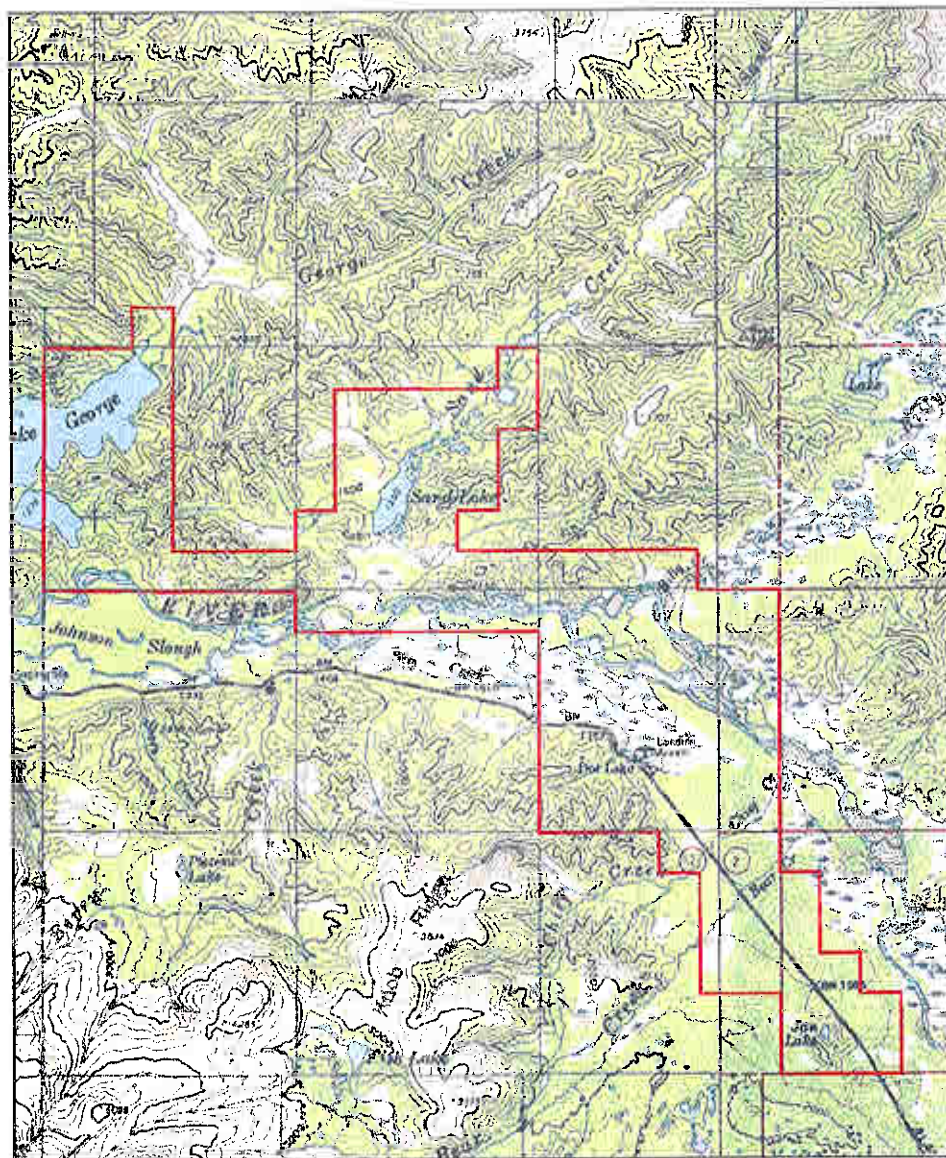
## INTRODUCTION

At the request of the Dot Lake Village Council and the Dot Lake Corporation, the Tanana Chiefs Conference, Inc. (TCC) forestry program conducted a forest inventory of forest resources on Dot Lake village corporation lands. Under the terms of the Alaska Native Claims Settlement Act (ANCSA) of 1971, the Dot Lake village corporation was authorized to select 69,120 acres of land surrounding the village of Dot Lake. Funding for the project was through the Bureau of Indian Affairs.

The project area is located approximately 160 miles southeast of Fairbanks, Alaska via the Richardson and Alaska Highways. It is roughly 60 miles east of Delta Junction (Figure 1). The project area covers 71,570 acres of both forested and non-forested land. Adjacent land owners include Doyon, Limited and the State of Alaska. All State of Alaska lands are within the Tanana Valley State Forest. Inholdings within the village corporation lands include private lands and Native allotments.

Information on forest resources presented in this report is a compilation of field data collected during 1980. The measured plots concentrated in the white spruce component of the forest, though hardwoods were also sampled. This report provides information on the location, species, size class, stocking and volume of forest resources on Dot Lake village lands.

## Dot Lake Village Corporation Lands



Scale: 1 inch equals 5 miles.  
1: 300000

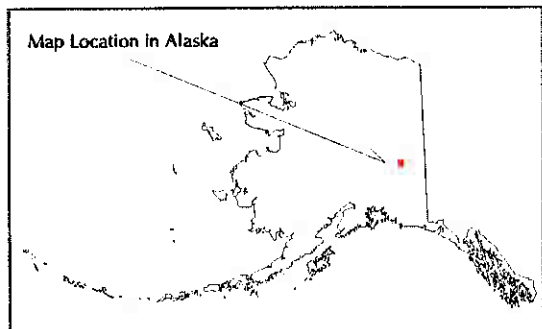
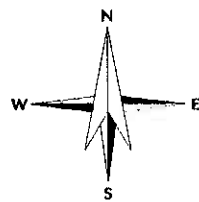
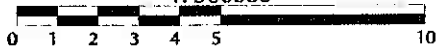


Figure 1. Project Vicinity Map



## PHYSICAL DESCRIPTION

### Topography

The project area is located in Interior Alaska adjacent to the village of Dot Lake and the Tanana River. Elevation of the village itself is about 1,500 feet. This area of the upper Tanana River forms a relatively narrow valley adjacent to the Yukon-Tanana uplands and the northern foothills of the Alaska Range. The main tributaries of the Tanana River rise in glaciers in the Alaska Range and their outwash deposits have pushed the Tanana River against the uplands to the north. The Tanana River is fast flowing and mostly braided throughout the project area.

Three large lakes occur within the project area: George Lake, Moosehead Lake, Sand Lake. George Lake is over 10 square miles in area, relatively large in size for the Tanana basin.

### Climate

The Dot Lake area is within the continental climatic zone which is characterized with large temperature differences between seasons and low annual precipitation. Climate data reported from Delta Junction shows average temperatures during the summer ranging from 40 degrees to 69 degrees Fahrenheit and in winter from -14 degrees to 26 degrees Fahrenheit. Extreme temperatures range from -63 degrees to 92 degrees. Precipitation averages 11 inches including 41 inches of snow (Selkregg 1976). Generally, frost free days occur from the middle of May until the third week of August.

### Geology

The portion of the project area within the Yukon-Tanana upland is underlain by Precambrian schist (course grained, platy rock) and gneiss (course grained, banded rock) intruded by scattered granitic bodies. The lower slopes of hills are underlain by a thick mantle of silty micaceous loess mostly derived from outwash plains south of the Tanana River. Loess depth varies, but usually is thinner on higher hills and ridges, where wind and water action have eroded the loess downward. On lee sides of lower hills and ridges, loess depth can be quite thick due to the eddy effect of wind. The portion of the project area along the Tanana River is alluvial in origin and underlain by unconsolidated deposits of gravel, sand, outwash fans, and loess. Stabilized vegetated sand dunes of Pleistocene age occur on the north side of the Tanana River in the Sand Lake area. The portion of the project area south of Dot Lake village and within the Alaska Range foothills is underlain by Tertiary conglomerate (compacted cemented granules, pebbles, and boulders) that plunge below the lowlands.

### Soils

The process of soil identification is an important step in determining forestry potential. Various levels of site productivity can be correlated to individual soil types. Soil characteristics are determined by five interrelated factors: parent material, climate, plants and animals, topography, time (Schoephorster 1973). The project area has not been glaciated but it is likely that soils in the area have developed since the time of maximum glacial advance in the Alaska Range. The well drained upland soils in which loess is no longer being deposited are considered mature soils with defined horizons or layers. Soils forming in the continuing deposits of alluvial plains are young and have not had time for horizon differentiation. Poorly drained soils on both alluvial and upland sites show little horizon differentiation.

The project area is within an exploratory soil survey of general nature (Selkregg 1976). This exploratory survey identifies four broad groups of soils found in the project area. Other soil groups that cover lesser amounts of acreage are also found within the project area.

**Histic Pergelic Cryaquepts (IAHP)**--Poorly drained soils with peaty surface layer and shallow permafrost table. These soils exist on broad alluvial plains, meander scars and in depressional areas on outwash plains. They occur on roughly 38 % of the project area.. The predominate vegetation on these soils are sedge tussocks, low growing shrubs, moss and black spruce. Generally, these soils are present on land classified as non-forest.

**Typic Cryofluvents (EFT)**--Young deep well drained soils in stratified materials on natural levees and low terraces adjacent to rivers and streams. These soils have an irregular distribution of organic material due to periodic flooding. They occur near and adjacent to the Tanana River and occupy roughly 15% of the project area. The EFT soil classification is the most productive bottomland soil type and is located in areas classified as forestland. Vegetation includes white spruce, birch, cottonwood, willow and alder.

**Aeric Cryaquepts (ICF)**--Well drained brown soils that contain lenses of fine grained material on outwash plains and hills. These soils have formed in shallow and moderately deep loess and do not have a continuous permafrost layer. They occupy roughly 18% of the project area. Birch, aspen, white spruce and black spruce are present on these productive upland soils. Generally lands classified as forestland are underlain by these soils.

**Typic Cryochrepts (ICT)**--Well drained nonacid soils on outwash plains and hills. These soils have formed in shallow and moderately deep loess and do not have a continuous permafrost layer. They are similiar to the Aeric Cryaquepts in that they support productive forestland. They are present on roughly 29% of the project

## METHODS

Forest inventory information was collected through a stratified random sampling design. The project area was divided into subpopulations (timber types) in order to account for variation in species composition, density and size class. Each timber type was then treated as a random sample population. Stratification of the forest sample population often gives more precise estimates of forest volume for a fixed cost than in a simple random sample design (Wenger 1984). Timber types sampled included sawtimber and poletimber types, reproduction and woodland types were not sampled. Sample measurements concentrated in the white spruce component of the forest. Measurements in some of the hardwood types resulted in fewer plots based on that type's relative occurrence within the total forest area than would have been indicated. As a result, the white spruce component was oversampled with respect to its percent of total forest area. Since at this time the white spruce type is the most important commercially, the increased sample size and thus lower sample error, is beneficial.

### Aerial Photographs

Black and white aerial photographs at the scale of 1:15,840 (4 inches = 1 mile) were used for the project. Project boundaries were transferred from U.S. Geological Survey topographic maps to the photos with a Bausch & Lomb stereo zoom transfer scope.

### Vegetation Typing

The project area was vegetation typed using an Old Delft scanning stereoscope. In the vegetation typing process, boundaries of individual features (polygons) were drawn on acetate film overlays attached to the photos. The smallest size of the polygons drawn was approximately 10 acres. Both forest and non-forestland features were delineated. Forestland is defined as land that is at least 10% covered by trees.

### Forestland Description:

White spruce (*Picea glauca*) occurs in pure stands and in mixed stands with birch, cottonwood, aspen and black spruce. It attains its best development on well drained to moderately well drained silt and sand loams. The well stocked white spruce type represents the most productive sites (Vioreck et al. 1992). The white spruce type is considered to be the climax vegetation type on the well drained upland sites but over several centuries on some floodplain sites however, white spruce types are replaced by black spruce as permafrost develops on the site.

Black spruce (*Picea mariana*) occurs in pure stands but may have a mixture of white spruce and hardwoods. Black spruce occurs commonly on organic soils with poor drainage, often underlain by permafrost. Generally, pure stands of black spruce were classified as woodlands.

Hardwood tree species include quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*) and cottonwood (*Populus balsamifera*). Due to the difficulty in distinguishing between aspen, birch and cottonwood during the timber typing process, these species were combined as hardwood types. Cottonwood situated on floodplain sites, however, could be distinguished from other hardwood species and was delineated as a separate timber type. The hardwood types include pure stands of birch and aspen and mixtures of the two. Aspen stands predominate, especially on the flats along the Alaska Highway. Cottonwood occurs in only small amounts in the hardwood type. Hardwood types attain their best development on well drained, sandy loam and silt loam soils. Aspen generally occurs on the warmest sites. Birch and aspen stands generally result from fires or other disturbances. When stands are destroyed by fire, both species sprout profusely, aspen from the roots and birch from the stump.

The cottonwood type is generally found in nearly pure stands on floodplains where erosion and flooding are active. These sites usually are quite productive. Cottonwood stands develop as a successional sequence that begins with alder-willow thickets on exposed sand bars and ends with white spruce forest.

Delineation of forestland timber types was based on tree species, size class and stand density. The most prevalent species determined the timber type. In mixed timber types, the secondary species represented at least 30% density of the type in question. Aids used in the interpretation of timber types on the photos included color, texture, hue and physical location of the stand in question. Woodlands, such as dwarf black spruce and occasional high elevation hardwoods, were also identified. Delineation of woodlands was based on tree species together with a dwarf descriptor. Woodlands are considered unproductive forestland.

#### Non-forestland Description:

Non-forestland is areas where trees contain less than 10% cover and are often absent. Non-forestland is commonly associated with poorly drained soils, permafrost, high elevation areas or human caused development. Non-forestland shrub types can also occur on recently disturbed areas such as burns or flooded areas, and can develop into forestland over time.

Non-forest vegetation types that were delineated from the aerial photography include willow, alder, dwarf birch, wetlands, barren areas and grassy meadows. Cultural features such as roads and villages were also identified and included as non-forest.

#### Field Inventory Design

The variable plot radius sampling method was used for field data collection. Field samples utilized cluster plots that on average, contained 10 plots grouped in the center of the timber stand. Measure trees were selected or rejected with a relascope prism. Species and estimated defect were recorded and tree diameter and total tree height were measured. Codominate and dominate trees were cored to determine average age and growth. Tree diameters were measured at 4.5 feet above ground, commonly known as "diameter breast height" or dbh. Only trees one inch dbh and greater and dead trees estimated to have died within the last five years were measured.

#### Vegetation Cover Type Maps

Together with the tabular data, vegetation cover type maps were produced for the inventory. A standardized vegetation key/mapping scheme was used for the typing and is compatible with surrounding village and State inventory projects (Table 1). The original maps were hand drawn after transferring the vegetation typed aerial photographs to 1:31,680 scale (2 inches = 1 mile) base maps. This hand drawn map was then digitized into the ArcInfo Geographic Information System (GIS) format where individual polygon acreages were calculated through the GIS process. Through the polygon area summary, a land classification chart by acreage was prepared (Table 2). Since the maps have been digitized, future analysis of individual portions of the project area, can readily be accomplished for planning purposes.

### Data Summary

Upon completion of the field work, sampled timber type data were entered into Omnitali, an inventory processor program. Field data from some sampled timber types were similar enough to each other to allow combining the timber types into like strata. The inventory contains seven separate sample strata for which estimates of net volume per acre have been calculated (Appendix A). The strata contains field data from 46 individual timber stands containing 407 plots (Table 3). The sample strata also contains acreage from timber types that were not sampled, but from field observations were deemed similar enough to be included in the strata in question. Timber types that were not similar enough to be included in the seven separate sample strata were still combined into additional strata but were omitted from the volume total. These sawtimber and poletimber types total 520 acres; these types are included in timberland area but not in the volume total. Table 4 shows acreage of the individual sampled and unsampled timber types for each strata as well as acreage of non-forest types.

Total inventory forest volume was calculated by expanding the average per acre volume figures for each sample strata by the number of acres each sample strata represents. These calculations were performed through a computer database program. Since numbers were rounded in the program, totals within some of the tables may not add up because of this rounding.

# VEGETATION TYPING SCHEME

## SPECIES CALLS

Forestland		Shrubland	
S	White Spruce	TS	Tall Shrub (Alder, Willow)
BS	Black Spruce	DM	Dry Meadow
CW	Cottonwood (bottomland sites)	DS	Dwarf Shrub (Bog Birch, Other)
H	Hardwood (Aspen/Birch/Cottonwood)	Tu	Tundra (herb, sedge, grass)
Wetlands		Special Cover Types	
W	Lakes/Ponds	Ba	Bare Ground/Gravel Bar
B	Bog/Herbaceous Species	Cu(95)	Cultural/Village
TSw	Tall Shrub Wet (in seasonably wet area)	Cu(96)	Cultural/Agriculture
WM	Wet Meadow	Cu(98)	Cultural/Roads/Airstrips
DSw	Dwarf Shrub Wet (in seasonably wet area)	Br	Recently Burned Area
R	River/Flowing water	L	Logged Area

## STAND DESCRIPTOR CALLS

D	Dwarf Forest/Scrub Forest	<	25 feet tall, any DBH
R	Reproduction	<	4.4" DBH
P	Poletimber	<	4.5" to 9.4" DBH
S	Sawtimber	>	9.5 inches DBH

## STAND DENSITY CALLS

1	10-24%	Calls are based on crown closure percent.
2	25-59%	
3	60-100%	

Table 1. Dot Lake vegetation typing scheme.

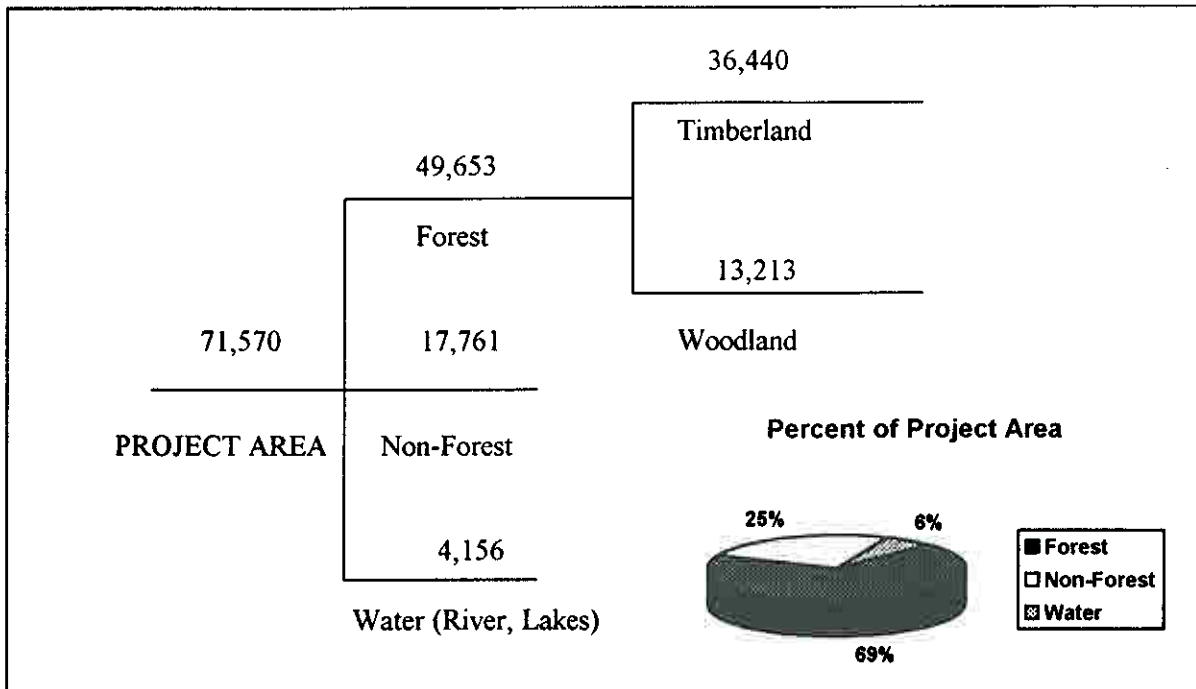


Table 2. Land classification chart by acreage.

		<u># of Plots</u>
Strata	1 White Spruce Sawtimber, Well Stocked (SS3)	254
Strata	2 White Spruce Poletimber, Well Stocked (SP3)	38
Strata	3 White Spruce Poletimber, Medium Stocked (SP2)	30
Strata	4 White Spruce Sawtimber/Hardwood Poletimber, Well Stocked (SS/HP3)	5
Strata	5 White Spruce Poletimber/Hardwood Poletimber, Medium Stocked (SP/HP2)	20
Strata	6 Hardwood Poletimber, Well Stocked (HP3)	10
Strata	7 Hardwood Poletimber, Medium Stocked (HP2)	50
<b>Total</b>		<b>407</b>

Table 3. Number of plots by sample strata.

Land Class	Strata Veg.Type	Acreage	# of polygons
Barren			
	Ba	935	34
	Land Class Totals:	935	34
Cultural			
	Cu96	30	2
	Cu98	335	1
	Land Class Totals:	365	3
River			
	R	3,174	4
	Land Class Totals:	3,174	4
Shrubland			
	DM	265	15
	DS	1,028	20
	TS	3,049	71
	TS/BSD	197	2
	TS/HR	32	1
	TS/SR	17	1
	Land Class Totals:	4,588	110
Timberland			
	CWP2		
	CWP2	194	12
	CWP3	44	4
	Strata Totals:	238	16
	CWR		
	CWR	51	4
	Strata Totals:	51	4
	CWS2		
	CWS2	8	1
	Strata Totals:	8	1
	HP1		
	HP1	90	5
	HP1/BSD	15	1
	HP1/SR	39	2
	SR/HP1	35	1
	Strata Totals:	179	9
	HP2		
	*HP2	10,200	91
	HP2/HR	27	1
	*HP2/SR	440	9
	*CWS3	15	1
	Strata Totals:	10,682	102

Table 4. Acreage and polygon summaries by vegetation type, strata, and land classification. Timber types marked as "\*" have been field sampled. Sample strata that contain volume estimates are in bold print.

Land Class	Strata	Veg. Type	Acreage	# of polygons
	<b>HP3</b>			
		*HP3	320	6
		HS3	394	7
		Strata Totals:	714	13
	<b>HR</b>	HR	11,585	130
		Strata Totals:	11,585	130
	<b>SP/HP1</b>			
		SP/HP1	24	1
		Strata Totals:	24	1
	<b>SP/HP2</b>			
		*HP/SP2	871	19
		*SP/HP2	170	7
		Strata Totals:	1,041	26
	<b>SP1</b>			
		SP1	45	6
		SP1/HR	11	1
		Strata Totals:	56	7
	<b>SP2</b>			
		HR/SP2	143	2
		*SP2	1,780	93
		SP2/HR	328	7
		Strata Totals:	2,250	102
	<b>SP3</b>			
		*SP3	1,077	48
		SP3/HR	11	1
		Strata Totals:	1,088	49
	<b>SR</b>			
		SR	1,909	104
		Strata Totals:	1,909	104
	<b>SR/HR</b>			
		SR/HR	383	15
		HR/SR	1,275	23
		Strata Totals:	1,658	38
	<b>SS/HP3</b>			
		*SS/HP3	207	8
		Strata Totals:	207	8

Table 4. Acreage and polygon summaries by vegetation type, strata, and land classification. Timber types marked as "\*" have been field sampled. Sample strata that contain volume estimates are in bold print.

Land Class	Strata	Veg.Type	Acreage	# of polygons
	<b>SS3</b>			
		SS/SP3	33	1
		SS2	57	6
		SS2/HR	7	1
		*SS3	4,636	82
		SS3/HR	17	1
		Strata Totals:	4,749	91
	Land Class Totals:		36,440	701
Water				
		W	4,156	26
	Land Class Totals:		4,156	26
Wetland				
		WM	8,564	54
		WM/BSD	136	1
	Land Class Totals:		8,700	55
Woodland				
		BSD	11,570	188
		BSD/DS	81	1
		BSD/HD	273	6
		BSD/TS	55	1
		BSD/WM	337	2
		HD	247	1
		HD/BSD	604	9
		SD	11	2
		SD/BSD	34	1
		Strata Totals:	13,213	211
	Land Class Totals:		13,213	211
Totals:			71,570	1,144

Table 4. Acreage and polygon summaries by vegetation type, strata, and land classification. Timber types marked as "\*" have been field sampled. Sample strata that contain volume estimates are in bold print.

## RESULTS

### Forestlands

Forestlands in the project area occupy 69% of the land and water area or 49,653 acres. Non-forestland amounts to 25% of the total project area or 17,761 acres. Water which includes rivers and lakes occupies 6% of the project area or 4,156 acres. Total project area is 71,570 acres (Table 2).

### Forest Volume Definitions

Estimates of timber volume on forested lands have been calculated with two different measurements; cubic foot volume and board foot volume (Figure 2). The cubic foot measurement is most useful for estimating total volume available and is easily converted into cords of wood. Roughly 100 cubic feet (1 CCF) of solid wood is equivalent to a cord. The cubic foot measurement, in this report, includes all timber greater than one inch dbh and is divided among the seedling/sapling, poletimber and sawtimber components of the forest. The seedling/sapling component of the forest includes all trees greater than 1 inch and less than 4.5 inches dbh. The poletimber component includes trees 4.5 inches to 9.4 inches dbh and the sawtimber component includes trees equal to or greater than 9.5 inches dbh.

A board foot is a slab of wood one inch thick, twelve inches wide, and twelve inches long. The board foot measurement is commonly used to determine the amount of boards that can be sawn from a log. Because the board foot measure is based on actual boards that can be sawn from a log, it disregards all material wasted in the process such as slabs and sawdust. The board foot measurement, in this report, only includes timber equal to or greater than 9.5 inches dbh.

Volume calculations for both cubic and board foot measurements are based on volume equations produced for Interior Alaska; U.S. Forest Service research notes NOR-5, NOR-6 and PNW-59. Board foot volume is reported in Scribner Decimal C scale and is based on 16 foot log segments (short log scale). For spruce it is reported to a 6 inch top (PNW-59) and for hardwoods to an 8 inch top (NOR-5). Cubic volume is reported in Smalian's rule and for spruce and hardwoods includes volume to a 4 inch top (NOR-6).

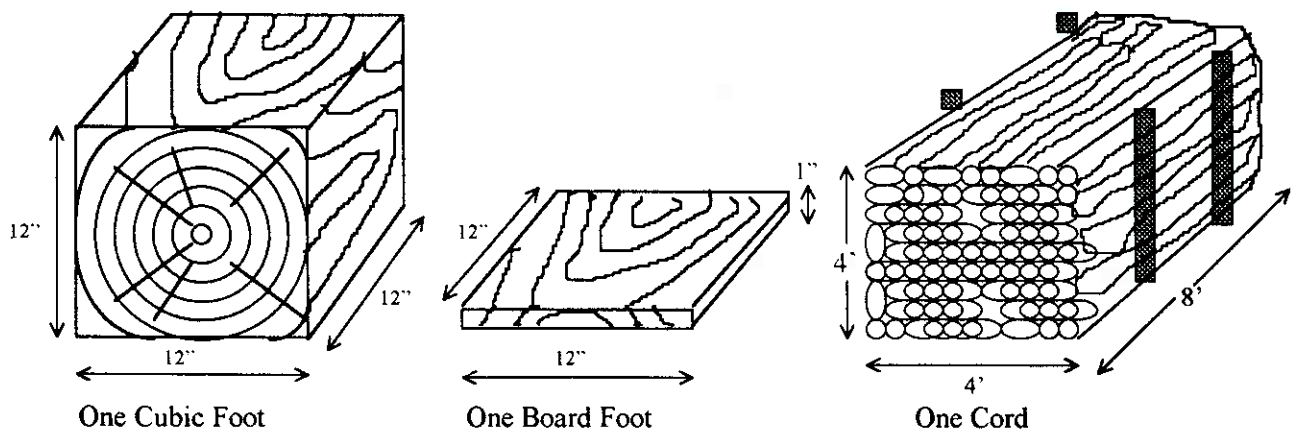


Figure 2. Volume Definitions

Timber volume calculations for both board feet and cubic feet are based on a net figure for all size classes.

$$\text{Net Volume} = \text{Gross Volume} - \text{Observed Defect}$$

Defect renders portions of individual trees unusable or of very limited use as forest products due to insect damage, rot and physical damage such as broken stems, sweep and crook. The net timber volumes shown however do not take into account all defect because hidden defect has not been estimated.

The average (weighted by strata acreage) estimated observed board foot defect for sawtimber by species was: white spruce, 0.1%; birch, 1.6%; aspen, 11%; cottonwood, 90%.

The average estimated (weighted by strata acreage) estimated observed cubic foot defect for poletimber by species was: white spruce, 0.1%; birch, 2%; aspen, 0%; cottonwood, 0%.

#### Net Forest Volume By Timber Type

When reporting board foot volume by timber type, the volume of all species in the sawtimber class found in that type are combined. Cubic volume includes all species in all size classes found in the type. For example, in the white spruce sawtimber types, table 5 reports a volume of almost 41,750,000 board feet, while most of this volume is in spruce sawtimber class, hardwood sawtimber that occurs in the type is also combined in the volume. A breakdown of the total volume found in the various types (strata) is shown in Appendix A.

A total of 20,718 acres of sawtimber and poletimber types contributed to the volume estimates in this study. An additional 520 acres of sawtimber and poletimber types are within strata that did not contain volume estimates (Table 4). The project area contained a total forestland area of 49,653 acres that includes reproduction and woodland types (Table 5).

Sawtimber types occupy 10% (4,980 ac.) of the forestland area and contain approximately 43,200,000 board feet or about 16,700,000 cubic feet of wood. White spruce sawtimber types contain the majority of the volume or about 41,700,000 board feet or 58% of the total board foot volume present. Mixed white spruce/hardwood sawtimber types occupy less than 1% (207 ac.) of the forestland area and contain approximately 1,500,000 board feet or 500,000 cubic feet.

Poletimber types occupy 33% (16,258 ac.) of the forestland area and contain approximately 29,300,000 board feet or about 30,800,000 cubic feet. In terms of board feet, these types contain 40% of the total board foot volume present. As can be seen from this percentage, the poletimber types contain a significant amount of sawtimber trees. White spruce poletimber types contain about 17,700,000 board feet or about 8,600,000 cubic feet. Hardwood timber types contain the majority of the forestland area or 11,560 acres. They also account for the majority of the cubic foot volume or about 20,400,000 cubic feet or 43% of the total cubic volume present. Mixed white spruce/hardwood poletimber types contain about 3,300,000 board feet or about 1,800,000 cubic feet.

Reproduction and woodland types together occupy 58% (28,416 ac.) of the forestland area. These types were not sampled and do not contribute to the volume estimates.

Timber Type	Total Net Volume					
	Acres	%	Board Feet	%	Cubic Feet	%
<b>Sawtimber Types:</b>						
White spruce	4,749	9	41,749,178	58	16,162,539	34
Cottonwood	23	<1				
Mixed White spruce/Hardwood	207	<1	1,480,580	2	526,754	1
Subtotal:	4,980	10	43,229,758	60	16,689,294	35
<b>Poletimber Types:</b>						
White spruce	3,394	7	17,667,700	24	8,623,761	18
Hardwood	11,560	23	8,307,888	11	20,400,028	43
Cottonwood	238	<1				
Mixed White spruce/Hardwood	1,065	2	3,332,619	5	1,763,629	4
Subtotal:	16,258	33	29,308,207	40	30,787,418	65
<b>Reproduction Types:</b>						
White spruce	1,909	4				
Hardwood	11,585	23				
Cottonwood	51	<1				
Mixed White spruce/Hardwood	1,658	3				
Subtotal:	15,203	31				
<b>Woodland Types:</b>						
White spruce	11	<1				
Black spruce	12,044	24				
Hardwood	247	<1				
Mixed White spruce/Black spruce	34	<1				
Mixed Black spruce/Hardwood	878	2				
Subtotal:	13,213	27				
<b>TOTAL:</b>	<b>49,653</b>	<b>100</b>	<b>72,537,964</b>	<b>100</b>	<b>47,476,712</b>	<b>100</b>

Table 5. Forestland area and volume by timber type.

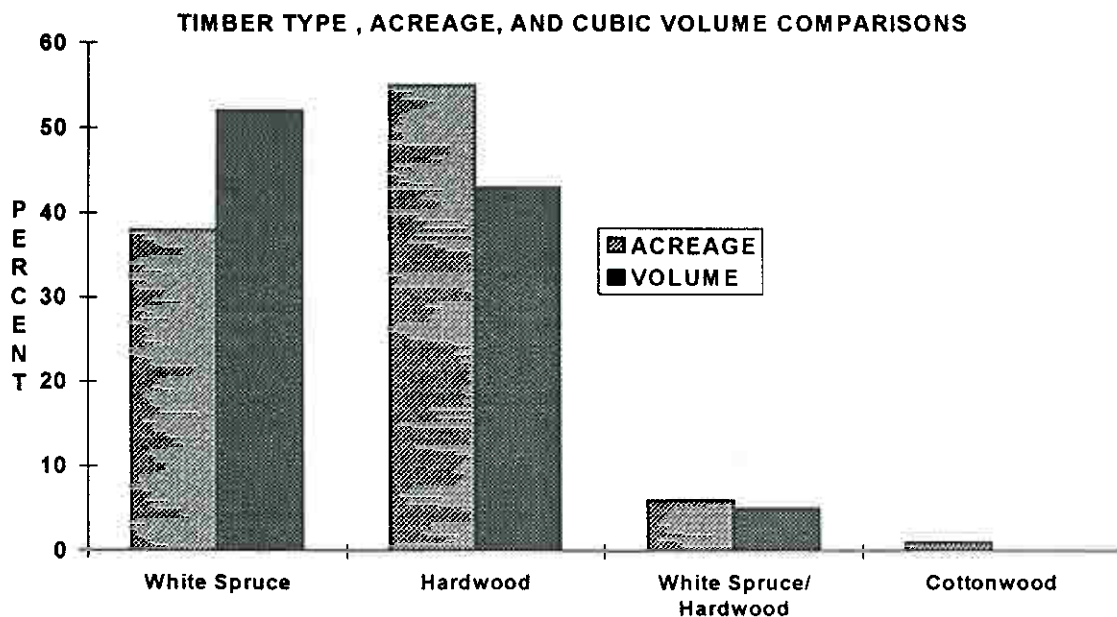


Figure 3. Percent of acreage and volume by sawtimber and poletimber types.

### Net Forest Volume by Size Class/Species Without Regard to Timber Type

Another way to report total volume is by combining the volume of each size class by species without regard to timber type. For example, what is the total volume of sawtimber trees, poletimber trees or seedling/saplings across all timber types within the project area?

Live sawtimber trees account for about 16,300,000 cubic feet or 34% of the total net volume (Table 6). Trees in the live poletimber class account for 58% of the total volume or about 27,300,000 cubic feet. The live seedling/sapling size class accounts for 8% of the total volume or about 3,700,000 cubic feet. Dead timber (all size classes) account for less than 1% of the total volume or almost 78,700 cubic feet.

In the species breakdown, white spruce accounts for the majority of the live sawtimber cubic volume or about 14,500,000 cubic feet. Aspen accounts for the majority of the live poletimber cubic volume or about 14,100,000 cubic feet. White spruce accounts for the next highest amount of poletimber at about 10,100,000 cubic feet.

The total volume of all species and size classes is 47,476,712 net cubic feet. In terms of net board feet the total volume of sawtimber (trees equal to or greater than 9.5 inches dbh) is 72,537,964 board feet.

Product Summary - Net Volume by Size Class/Species  
without regard to timber type

Species/Size Class	Total Net Volume			
	Board Feet*	%	Cubic Feet	%
Live Sawtimber				
White spruce	65,049,585	90	14,470,266	30
Birch	5,508,544	8	1,316,284	3
Aspen	1,978,363	3	518,980	1
Cottonwood	1,472	<1	617	<1
Subtotal:	72,537,964	100	16,306,148	34
Dead - All Size Classes				
White spruce			78,695	<1
Subtotal:			78,695	<1
Live Poletimber				
White spruce			10,096,380	21
Birch			3,133,563	7
Aspen			14,066,444	30
Cottonwood			50,995	<1
Subtotal:			27,347,383	58
Live Seedling/Sapling				
White spruce			1,731,187	4
Birch			66,737	<1
Aspen			1,941,026	4
Cottonwood			5,538	<1
Subtotal:			3,744,487	8
TOTAL:	72,537,964	100	47,476,712	100

\* Board feet calculated for trees 9.5" DBH and greater.

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Table 6. Product Summary - Net volume by size class/species without regard to timber type.

### Estimated Sampling Error

Sample error was calculated for the net cubic foot estimate for the Dot Lake forest inventory and is reported without regard to timber type (Table 7). It is given separately for the poletimber and sawtimber components of the forest. A combined sample error is also given which includes all size classes (sawtimber, poletimber, dead, seedling/sapling). The sample error percent is given within two standard deviations of the mean. This means that there is a 95% chance (two standard deviations) that the inventory volume is within plus or minus the error percentage indicated. For example, the total volume of timber is 47,476,712 cubic feet and Table 7 shows a sample error of 5.3%. This means that for a total volume of 47,476,712 there is a 95% chance that the volume is within 2,516,266 cubic feet (5.3%) of the total volume estimate.

#### Forest Inventory Error Percent by Product Class

Strata	# of Plots	Poletimber		Sawtimber		All Product Classes	
		CF/Acre	Stand. Error	CF/Acre	Stand. Error	CF/Acre	Stand. Error
SS/HP3	5	736	270.87	1,583	452.12	2,543	471.90
SP/HP2	20	963	195.82	717	242.08	1,695	304.89
HP3	10	141	265.61	74	74.35	2,064	269.04
HP2	50	386	108.84	183	94.39	1,774	138.40
SS3	254	1,283	75.19	1,955	85.36	3,403	111.47
SP3	38	1,304	150.60	1,455	192.51	3,047	241.69
SP2	30	1,038	163.95	1,047	299.70	2,360	247.73
Total:	407						

#### Poletimber:

Mean Cubic Feet/Acre (weighted by number of plots per strata): 1,106  
Standard Error of the Mean: 53.5  
Sampling Error %: 9.6

#### Sawtimber:

Mean Cubic Feet/Acre (weighted by number of plots per strata): 1,512  
Standard Error of the Mean: 62.9  
Sampling Error %: 8.3

#### All Product Classes:

Mean Cubic Feet/Acre (weighted by number of plots per strata): 2,965  
Standard Error of the Mean: 79  
Sampling Error %: 5.3

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Table 7. Net cubic feet volume sampling error.

### Estimated Annual Harvest

An estimate of the annual allowable harvest has been made to guide future harvest activities. The calculations are based on the simple area cut method. This method divides the total productive forest area by the rotation age which gives the acreage that can be harvested in a year. The acreage is then multiplied by the weighted average volume per acre to determine the annual harvest. The calculations of harvest level are based on the following assumptions:

1. In harvesting timber, the most accessible stands would probably be cut first, leaving the more remote stands. These remote stands would be more costly to access, but are still considered in the calculations of estimated harvest levels.
2. By cubic foot volume, the existing forest consists of 34% sawtimber, 58% poletimber, less than 1% recently dead timber and 8% seedling/sapling (Table 6). It is assumed that harvests will concentrate in the sawtimber and poletimber components of the forest. No allowance has been made for growth or mortality.
3. Growth and age information, field observations and previous timber sale data, suggest that white spruce sawtimber products, houselogs and poles can be produced by age 120 years and that hardwood sawtimber products and fuelwood can be produced by age 80. Beyond that age, tree growth begins to decline and mortality increases especially in the hardwoods.
4. Natural regeneration of white spruce and hardwoods depends on two main factors; seed source and type of seed bed. Under normal seed production conditions, it is estimated that natural regeneration will occur within 5 to 10 years following harvest. In stands with thick moss cover it may be necessary to scarify (remove moss layer) to obtain natural regeneration within this period (Zasada 1971). Where adjacent seed sources are not available, hand planting of seedlings may be required to obtain regeneration within this period. Failure of regeneration, on a consistent basis, to occur within the 10 year period, would have the effect of eventually reducing the harvest levels shown.

### Estimated White Spruce Harvest Level:

From the inventory data there are 9,360 acres within the spruce and mixed spruce/hardwood sampled and unsampled strata. If sawtimber products can be produced in 120 years, and it takes 10 years for regeneration, then the number of acres that can be harvested annually is as follows:

$$\begin{array}{l} \text{Estimated} \\ \text{Harvest} \end{array} = \frac{9,360 \text{ acres}}{130 \text{ years}} = 72 \text{ acres per year}$$

From the inventory data, these types have approximately 2,569 net cubic feet per acre of white spruce poletimber and sawtimber volume and 6,820 net board feet of white spruce sawtimber volume. The annual harvest level would then be approximately 185,000 cubic feet or 490,000 board feet. The board foot figure contains only sawlog size trees.

#### Estimated Hardwood Harvest Level:

From the inventory data there are 13,050 acres within the hardwood, cottonwood and mixed spruce/hardwood sampled and unsampled strata. If fuelwood/sawlog products can be produced in 80 years, and it takes 10 years for regeneration, then the number of acres that can be harvested annually is as follows:

$$\begin{array}{rclcl} \text{Estimated} & = & \frac{13,050 \text{ acres}}{90 \text{ years}} & = & 145 \text{ acres per year} \\ \text{Harvest} & & & & \end{array}$$

From the inventory data, these types have approximately 1,417 net cubic feet per acre of hardwood pole timber and saw timber volume and 562 net board feet of hardwood saw timber volume. The annual harvest level would then be approximately 205,500 cubic feet or 81,500 board feet. The board foot figure contains only sawlog size trees.

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**APPENDIX A**  
**Net Volume Per Acre and Total Volume by**  
**Sample Strata**

Strata: HP2

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
<b>Live Sawtimber</b>						
White spruce	113	15	25	1	1,210,402	270,842
Birch	500	66	119	7	5,337,729	1,274,080
Aspen	146	19	38	2	1,561,031	409,298
Subtotal:	760	100	183	10	8,109,162	1,954,220
<b>Live Poletimber</b>						
White spruce			23	1		251,959
Birch			197	11		2,104,946
Aspen			1,155	65		12,327,907
Subtotal:			1,376	78		14,684,812
<b>Live Seedling/Sapling</b>						
White spruce			45	3		489,935
Birch			3	<1		32,322
Aspen			165	9		1,764,350
Subtotal:			214	12		2,286,607
<b>TOTAL:</b>	<b>760</b>	<b>100</b>	<b>1,774</b>	<b>100</b>	<b>8,109,162</b>	<b>18,925,639</b>

Total acreage of Timber Type = 10,667

\* Board feet calculated for trees 9.5" DBH and greater.

Strata: HP3

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
Live Sawtimber						
Aspen	278	100	74	4	198,729	53,106
Subtotal:	278	100	74	4	198,729	53,106
Live Poletimber						
Aspen			1,848	90		1,320,318
Subtotal:			1,848	90		1,320,318
Live Seedling/Sapling						
Aspen			141	7		100,963
Subtotal:			141	7		100,963
TOTAL:	278	100	2,064	100	198,729	1,474,387

Total acreage of Timber Type = 714

\* Board feet calculated for trees 9.5" DBH and greater.

Strata: SP/HP2

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
Live Sawtimber						
White spruce	3,073	96	684	40	3,198,080	712,182
Birch	60	2	14	1	62,731	15,525
Aspen	69	2	17	1	71,806	18,345
Subtotal:	3,202	100	717	42	3,332,617	746,052
Live Poletimber						
White spruce			159	9		165,640
Birch			760	45		791,128
Aspen			4	<1		4,975
Subtotal:			924	55		961,743
Live Seedling/Sapling						
White spruce			10	1		10,697
Aspen			43	3		45,138
Subtotal:			53	3		55,835
TOTAL:	3,202	100	1,694	100	3,332,617	1,763,630

Total acreage of Timber Type = 1,040

\* Board feet calculated for trees 9.5" DBH and greater.

Strata: SP2

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
Live Sawtimber						
White spruce	4,683	100	1,046	44	10,537,795	2,354,946
Subtotal:	4,683	100	1,046	44	10,537,795	2,354,946
Live Poletimber						
White spruce			1,032	44		2,322,993
Aspen			59	3		133,768
Subtotal:			1,091	46		2,456,761
Live Seedling/Sapling						
White spruce			215	9		485,321
Aspen			5	<1		12,081
Subtotal:			221	9		497,402
TOTAL:	4,683	100	2,359	100	10,537,795	5,309,109

Total acreage of Timber Type = 2,250

\* Board feet calculated for trees 9.5" DBH and greater.

Strata: SP3

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
Live Sawtimber						
White spruce	6,553	100	1,454	48	7,129,905	1,582,898
Subtotal:	6,553	100	1,454	48	7,129,905	1,582,898
Live Poletimber						
White spruce			1,248	41		1,357,993
Birch			24	1		26,358
Aspen			64	2		69,781
Cottonwood			26	1		28,863
Subtotal:			1,363	45		1,482,995
Live Seedling/Sapling						
White spruce			218	7		237,733
Aspen			5	<1		5,485
Cottonwood			5	<1		5,541
Subtotal:			228	8		248,759
TOTAL:	6,553	100	3,046	100	7,129,905	3,314,652

Total acreage of Timber Type = 1,087

\* Board feet calculated for trees 9.5" DBH and greater.

Strata: SS/HP3

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
Live Sawtimber						
White spruce	6,626	93	1,454	57	1,372,502	301,213
Birch	521	7	128	5	108,079	26,678
Subtotal:	7,148	100	1,583	62	1,480,581	327,891
Live Poletimber						
White spruce			117	5		24,364
Birch			618	24		128,110
Aspen			94	4		19,583
Subtotal:			830	33		172,057
Live Seedling/Sapling						
White spruce			46	2		9,586
Birch			83	3		17,223
Subtotal:			129	5		26,809
TOTAL:	7,148	100	2,543	100	1,480,581	526,757

Total acreage of Timber Type = 207

\* Board feet calculated for trees 9.5" DBH and greater.

Strata: SS3

Species/Size Class	Net Volume Per Acre				Total Net Volume	
	Board Feet*	%	Cubic Feet	%	Board Feet*	Cubic Feet
Live Sawtimber						
White spruce	8,759	99	1,947	57	41,600,903	9,248,186
Aspen	30	<1	8	<1	146,798	38,230
Cottonwood	<1	<1	<1	<1	1,471	618
Subtotal:	8,790	100	1,955	57	41,749,172	9,287,034
Dead - All Size Classes						
White spruce			16	<1		78,700
Subtotal:			16	<1		78,700
Live Poletimber						
White spruce			1,257	37		5,973,430
Birch			17	1		83,015
Aspen			40	1		190,115
Cottonwood			4	<1		22,132
Subtotal:			1,319	39		6,268,692
Live Seedling/Sapling						
White spruce			104	3		497,913
Birch			3	<1		17,197
Aspen			2	<1		13,008
Subtotal:			111	3		528,118
TOTAL:	8,790	100	3,403	100	41,749,172	16,162,544

Total acreage of Timber Type = 4,749

\* Board feet calculated for trees 9.5" DBH and greater.

**APPENDIX B**  
**Stand Tables For Spruce Sample Strata**

Strata: SS3  
White Spruce Sawtimber, Well Stocked

Basal Area, Number of Live Trees  
and Net Board Foot Volume Per Acre by Diameter Class  
(White Spruce Sawtimber Size Class Only)

Diameter Class (Inches)	-----PER ACRE-----			Percent of Total Volume/Acre
	Basal Area	Number of Trees	Net Board Foot Volume	
10	17	30	1,734	20
11	15	22	1,615	18
12	11	14	1,381	16
13	8	9	1,001	11
14	6	6	813	9
15	4	3	610	7
16	3	2	422	5
17	3	2	460	5
18	1	1	210	2
19	1	1	209	2
20	<1	<1	145	2
21	<1	<1	47	< 1
23	<1	<1	57	<1
27	<1	<1	55	<1
Total	72	91	8,759	100

Strata: SP3  
White Spruce Poletimber, Well Stocked

Basal Area, Number of Live Trees  
and Net Board Foot Volume Per Acre by Diameter Class  
(White Spruce Sawtimber Size Class Only)

Diameter Class (Inches)	-----PER ACRE-----			Percent of Total Volume/Acre
	Basal Area	Number of Trees	Net Board Foot Volume	
10	9	16	812	12
11	10	15	999	15
12	14	18	1,548	24
13	6	6	699	11
14	7	6	902	14
15	3	2	421	6
16	1	1	164	2
17	1	<1	186	3
18	2	1	314	5
19	2	1	326	5
20	1	<1	182	3
Total	56	68	6,553	100

Strata: SP2  
White Spruce Poletimber, Medium Stocked

Basal Area, Number of Live Trees  
and Net Board Foot Volume Per Acre by Diameter Class  
(White Spruce Sawtimber Size Class Only)

Diameter Class (Inches)	-----PER ACRE-----			Percent of Total Volume/Acre
	Basal Area	Number of Trees	Net Board Foot Volume	
10	11	20	972	21
11	10	15	903	19
12	5	6	460	10
13	3	4	344	7
14	9	8	1,038	22
15	2	2	269	6
17	4	3	457	10
18	2	1	240	5
<b>Total</b>	<b>46</b>	<b>59</b>	<b>4,683</b>	<b>100</b>

Strata: SS/HP3  
White Spruce Sawtimber/Hardwood  
Poletimber, Well Stocked

Basal Area, Number of Live Trees  
and Net Board Foot Volume Per Acre by Diameter Class  
(White Spruce Sawtimber Size Class Only)

Diameter Class (Inches)	-----PER ACRE-----			Percent of Total Volume/Acre
	Basal Area	Number of Trees	Net Board Foot Volume	
11	12	18	1,221	19
12	6	7	558	9
13	6	7	751	11
14	6	6	674	10
15	6	5	827	12
16	12	8	1,539	23
21	6	3	1,056	16
Total	54	54	6,626	100

Strata: SP/HP2  
White Spruce Poletimber/Hardwood  
Poletimber, Medium Stocked

Basal Area, Number of Live Trees  
and Net Board Foot Volume Per Acre by Diameter Class  
(White Spruce Sawtimber Size Class Only)

Diameter Class (Inches)	-----PER ACRE-----			Percent of Total Volume/Acre
	Basal Area	Number of Trees	Net Board Foot Volume	
10	8	15	892	29
11	1	2	140	4
12	7	8	753	25
13	1	1	157	5
14	2	2	271	9
15	2	2	322	10
16	2	1	233	8
18	2	1	305	10
Total	25	32	3,073	100

APPENDIX C

White Spruce Growth Information

# White Spruce Growth Information Within White Spruce Types

Stand Number	Diameter (Inches)	Total Height (Feet)	Age (Years)	10 Year Growth (1/20 Inch)
1	111.3	75	101	4
	9.5	65	82	10
	10.6	73	110	3
2	11.1	81	105	11
	10.7	70	110	7
	11.7	85	105	5
3	14.5	95	89	11
	11.4	76	86	5
	11.6	79	99	8
4	13.5	85	152	6
	11.7	88	92	8
6	14.8	83	129	10
	11.7	81	124	5
	14.6	81	124	5
7	12.0	90	175	4
	10.3	86	115	5
	13.1	92	112	4
8	11.1	75	93	4
	11.3	67	99	8
	10.7	74	97	6
9	10.2	60	105	5
	7.8	54	85	7
	7.0	53	100	5
	10.2	58	115	2
10	8.6	66	117	5
	10.0	60	109	5
	11.4	67	80	6
13	9.3	65	117	6
	8.9	56	108	4
	8.9	75	105	2
14	9.8	70	156	4
	10.3	78	159	3
15	8.3	70	146	5
	10.0	73	153	2
	8.7	63	139	3
17	11.3	74	112	4
	12.3	68	126	3
	11.7	68	123	6
18	10.2	70	119	4
	9.8	70	168	3
	10.4	79	162	4
19	11.4	83	166	4
	11.0	78	173	6

# White Spruce Growth Information Within White Spruce Types

Stand Number	Diameter (Inches)	Total Height (Feet)	Age (Years)	10 Year Growth (1/20 Inch)
24	9.0	57	79	10
	13.5	79	308	2
	13.8	94	227	3
26	11.1	89	189	8
	13.4	83	145	4
	12.6	92	156	3
27	10.9	77	216	2
	9.4	71	131	3
	10.7	74	217	3
29	9.0	70	190	4
	8.9	65	160	4
30	10.4	78	118	4
	8.4	67	134	4
	12.5	82	139	5
31	11.5	77	65	5
	12.3	76	74	9
	14.5	84	150	8
44	6.2	50	54	6
	6.3	47	49	8
	10.6	60	66	8
45	12.5	85	98	9
	11.4	79	99	9
	16.2	104	110	5
46	11.9	102	134	2
	10.5	78	125	5
	13.8	107	129	2
47	14.8	105	139	5
	11.9	97	151	5
	11.1	90	163	6
21	9.0	63	95	2
	9.6	60	80	8
	10.3	61	78	7
25	12.9	67	223	2
	9.3	57	82	9
	8.3	61	135	11
28	13.1	94	128	6
	12.5	88	131	4
	10.5	85	101	8
32	9.2	59	83	5
	8.9	61	99	7
	10.6	66	278	6
22	7.0	51	90	3

White Spruce Growth Information Within White Spruce Types

Stand Number	Diameter (Inches)	Total Height (Feet)	Age (Years)	10 Year Growth (1/20 Inch)
22	7.6	52	84	3
	8.6	53	88	2
33	8.8	60	87	4
	10.2	61	65	14
	9.9	57	127	12
35	14.4	69	72	10
	11.7	68	70	9
36	15.0	83	190	4
	11.2	63	149	10
	13.0	74	138	9

White Spruce Growth Summary

GROWTH PARAMETER	NUMBER OF SAMPLES	AVERAGE	RANGE
Diameter (inches)	95	12.0	6.2 - 16.2
Total Height (feet)	95	74	47 - 107
Age (years)	95	125	49 - 308
Radial Growth (1/20")	95	6	2 - 11

**APPENDIX D**  
**Vegetation Type Map Accuracy**

## Introduction

Vegetation type map accuracy was determined when sampled vegetation types on the ground were compared to the types indicated on the maps. Vegetation types were initially interpreted from black and white aerial photography before being transferred to the maps.

## Summary

When the vegetation type maps were checked for accuracy a contingency table was prepared to indicate the reliability of the map. Table 1 shows map reliability when examining the single species timberland calls. Producer's accuracy is the probability that a type on the ground will be adequately represented by the map, and is calculated by dividing the number of agreements for a land cover class by the total number of ground observations for that category. User's accuracy is the probability that a class shown on the map actually represents that class on the ground. It is calculated by dividing the number of agreements for a land cover class by the total number of polygons classified on the map in that category. The overall map accuracy is the weighted average of the user's accuracies. The weighting was by vegetation type acreage. Overall map accuracy for single species types was 66%. The CWS3 type only contained one sample which was actually an HP2 type on the ground. Because of this discrepancy, these two types were processed together in the HP2 strata to determine volume per acre.

Table 2 describes the nature of disagreements between map classifications and ground observations. Seven types of error are described with the least serious on the left side of the table (size class, density, species) and the most serious on the right side of the table (disagreements in combinations of size class, density, species). Size class, a relatively non-serious error type, accounted for the highest amount of disagreements or 29 percent of the 41 total observations. These errors mostly occurred when SS3 types shown on the map were really SP3 types on the ground. The misclassification of the CWS3 type resulted in one error for size class/density/species. Disagreements of this nature means all elements of the timber type call were misclassified.

Table 3 shows map reliability when examining mixed species timberland calls. Overall map reliability was 22%. Reliability of mixed timberland calls is generally lower than in single species calls. This is mostly due to the difficulty in accurately classifying the minor species of the mixed call.

Table 4 describes the different error types for mixed species. Error was uniformly distributed between size class, size class/density and size class/species. Each of these error classes consisted of 7% of all the mixed species observations.

Table 1. Contingency table comparing single species timber types to ground observations.

Ground Observations	Map Classification						Total	Producer's Accuracy (%)
	SS3	SP3	SP2	HP3	HP2	CWS3		
SS3	14	1	1	-	-	-	16	88
SS2	1	-	-	-	-	-	1	0
SP3	10	2	1	-	-	-	13	15
SP2	1	1	2	-	-	-	4	50
SR	1	-	-	-	-	-	1	0
HP3	-	-	-	1	1	-	2	50
HP2	-	-	-	-	3	1	4	75
Totals	27	4	4	1	4	1	41	
User's Accuracy (%)	52	50	50	100	75	0		

Overall map accuracy = 66% (Weighted by acreage of type)

Table 2. Number of Disagreements between ground observations and map classes attributed to each error type, single species map classifications.

Ground Observations	Map Classification			Error Types				
		Size Class	Density	Species	Size Class/ Density	Size Class/ Species	Density/ Species	Size/ Density/ Species
SS3	SP3	1	-	-	-	-	-	-
	SP2	-	-	-	1	-	-	-
SP3	SS3	10	-	-	-	-	-	-
	SP2	-	1	-	-	-	-	-
SP2	SP3	-	1	-	-	-	-	-
SR	SS3	1	-	-	-	-	-	-
HP2	CWS3	-	-	-	-	-	-	1
Errors (Total):		12	2	-	1	-	-	1
Percentage of all observations:		29%	5%	0%	2%	0%	0%	2%

Table 3. Contingency table comparing mixed species timber types to ground observations.

Ground Observations	Map Classification				Total	Producer's Accuracy (%)
	<u>SS</u> HP3	<u>SP</u> HP2	<u>HP</u> SP2	<u>HP2</u> SR		
SS/HP3	1	-	-	-	1	100
SP/HP2	-	1	-	-	1	100
HP/SS3	-	-	1	-	1	0
HR/SP2	-	-	1	-	1	0
HP2	-	-	-	1	1	0
Totals	1	1	2	1	5	
User's Accuracy (%)	100	100	0	0		

Overall map accuracy = 22% (Weighted by acreage of type)

Table 4. Number of Disagreements between ground observations and map classes attributed to each error type, mixed species map classifications.

Ground Observations	Map Classification	Error Types						
		Size Class	Density	Species	Size Class/ Density	Size Class/ Species	Density/ Species	Size/ Density/ Species
HP/SS3	HP/SP2	-	-	-	1	-	-	-
HR/SP2	HP/SP2	1	-	-	-	-	-	-
HP2	HP2/SR	-	-	-	-	1	-	-
Errors (Total):		1	-	-	1	1	-	-
Percentage of all observations:		7%	0%	0%	7%	7%	0%	0%

