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Land Ownership Patterns in the Tanana River Basin, Alaska, 1984

Willem W.S. van Hees



Author

WILLEM W.S. VAN HEES is a research forester for Alaska Forest Inventory and Analysis at the Forestry Sciences Laboratory, Pacific Northwest Forest and Range Experiment Station, 2221 E. Northern Lights Blvd., Anchorage, Alaska 99508.

Abstract

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Aerial photo sampling coupled with information taken on the ground provided data for development of estimates of land and forest area by ownership group within the boundaries of the 1971-75 Tanana River Basin timber inventory unit, Alaska. Area of privately owned timberland is estimated at 280,634 acres (113 569 hectares).

Keywords: Land owners, forest surveys, Alaska (Tanana River).

Summary

This report contains results of the first study conducted to estimate the amount of land held by private and public owners within the confines of the 1971-75 Tanana inventory unit. A combination of aerial photo and ground sampling was used to arrive at the estimates. Total privately owned forest land is estimated to be 1,083,615 acres; publicly owned, 10,241,057 acres. Total privately owned and publicly owned areas, including Census and non-Census water, are estimated to be 1,514,850 and 12,133,021 acres, respectively.

Preface

Forest Inventory and Analysis (FIA) is a nationwide project of the USDA Forest Service authorized by the Forest and Rangeland Renewable Resources Research Act of 1978. Work units of the project, located at Forest Service Experiment Stations, conduct forest resource inventories throughout the 50 States. The Pacific Northwest Forest and Range Experiment Station is responsible for forest inventories in Alaska, California, Hawaii, Oregon, and Washington.

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Introduction

Knowledge of natural resource ownership patterns is integral to development of policy and planning for managing the resources. In Alaska, this information is difficult to identify because ownership of land changes frequently. These changes in land status are the result of Federal legislation: the Alaska Statehood Act of 1958, Public Law 85-508; the Alaska Native Claims Settlement Act of 1971, Public Law 92-203; and the Alaska National Interest Lands Conservation Act, Public Law 96-487. Selection of land by Alaska Natives and withdrawal of wilderness areas are nearly complete, but selections by the State of Alaska will remain uncertain for the next 5-10 years.

The area to which statistics in this report apply is the 1971-75 Tanana River Basin timber inventory unit (fig. 1). Within the Tanana River Basin, changes in ownership of private land have stabilized, and the private land base will most likely not decrease in the future. Approximately 100,000 acres of land in the Delta Junction area, known as the Delta Barley Project, are owned by the State of Alaska but, as certain conditions of loan repayment and agricultural development are met, title will

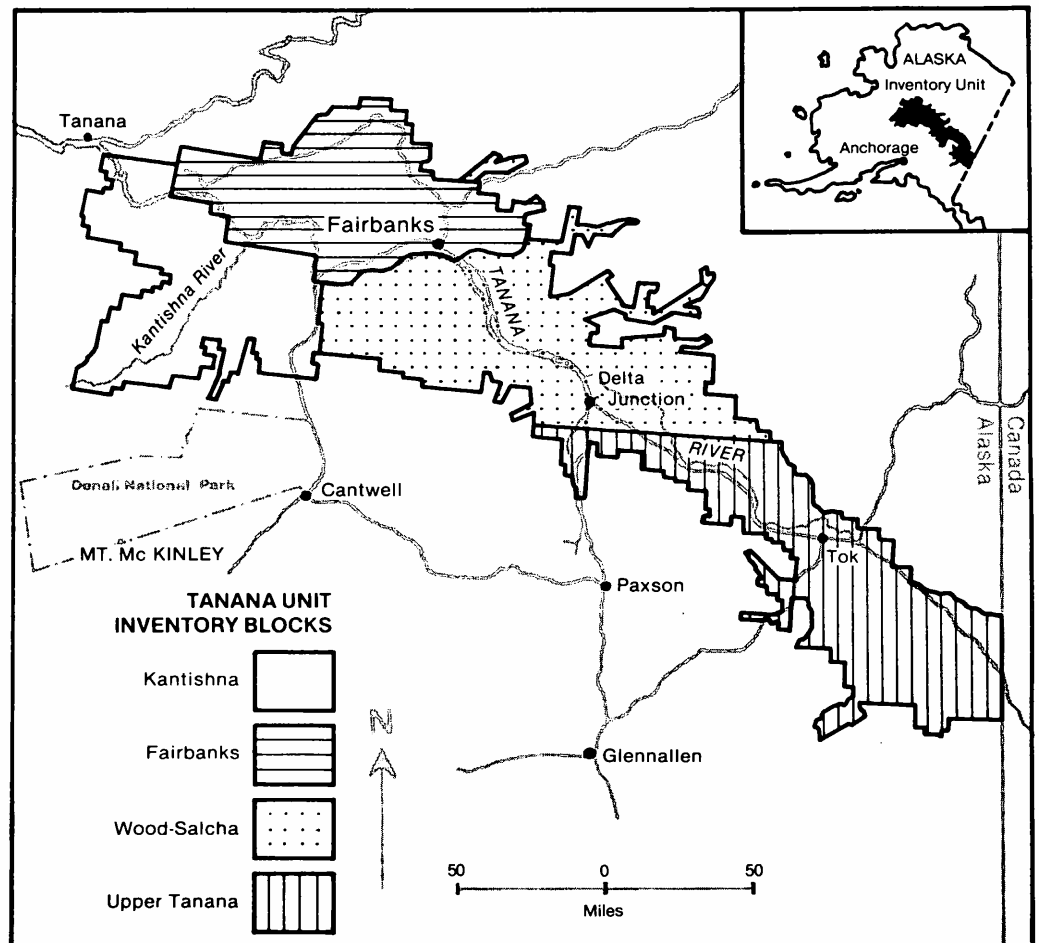


Figure 1.-Tanana inventory unit

be conveyed to private owners. Ownership of other lands is in public hands and is still in a state of flux. This second owner category includes Federal, State, and municipal agencies. The State of Alaska will continue to make land available to private owners through its land disposal program for many years.

Just as the "public" ownership category is a combination of different public landholders, the "private" category is a combination of Alaska Natives and "other private" owners. The broad group "Alaska Native" includes general Native allotments, townsite settlements, and townsite trusteeships (wherein the land is held in trust by a Federal agency). The "other private" group includes homesteads, private airport conveyances, and mining claims. In this study Alaska Native holdings are separate from other private holdings; however, separation of the public category into its constituent parts was not possible with the procedures used.

Objectives

The main objective of this study was to produce estimates of timberland area held by private owners and by other public owners within the 1971-75 Tanana River Basin timber inventory unit. Additionally, estimates of the distribution of this acreage by forest type, stand-size class, and productivity class were desired.

Methods and Procedure

The basic procedure used to produce estimates of land area held by private and public owners was to identify private acreages first and then to subtract those figures from figures for the total Tanana River Basin inventory unit area to find the area owned by public owners.

Only the private lands for which title was conveyed to the owner were included in this study. The estimates presented in this report were current in March 1984, the date this study was begun; because land ownership changes often, they are point-in-time estimates.

The Bureau of Land Management (BLM), U.S. Department of the Interior, helped locate parcels of land that were privately owned within the Tanana unit. The BLM maintains an up-to-date file of lands for which title has been conveyed. They produced maps with a scale of 1:250,000 showing townships, ranges, and sections of privately owned lands for which title had been conveyed. Alaska Native holdings were mapped in one color and private holdings in another color.

One section, 640 acres, was the resolution used for drawing the maps. Consequently, the exact location of a particular private owner's piece of land was often impossible to determine from these maps. Exact location of a given owner's parcel can be found by examination of master survey plats, but this procedure would have been prohibitively expensive in terms of time and money. Along with the maps a computer printout was made listing exact acreages within the sections drawn on the maps. When the overlay of the Tanana timber inventory unit boundary was placed on the BLM maps, all sections containing private lands within the unit were identified. Exact acreages were then extracted from the printout.

Because exact location of privately owned lands was not achieved, precise photo interpretation of individual parcels to establish forest and land type could not be accomplished. Instead an aerial photo sample was taken as follows: After sections containing privately owned parcels of land were located and identified, photos covering those sections were identified from an aerial photo mozaic. These photos are 1:15,840 scale black and white photos; on each one three circular, 1-acre plots were interpreted to establish land and forest types.

Results of the photo interpretation were tabulated by land and forest type. From this tabulation a percent distribution of photo plots among the various land and forest type categories was developed. This percent distribution of photo plots was applied to the total privately owned acreage to categorize it by land and forest type.

Because this preliminary distribution was based on a photo sample, it was adjusted to reflect the distributions produced from the ground sample taken during the 1971-75 inventory (land and forest type were expected to change little if at all in the intervening decade). These acreages were further broken down into stand size and productivity classes by the use of proportions developed from inventory data.

Results and Discussion

Estimates in this report are subject to two types of error; procedural error and sampling error. Procedural errors were minimized by checking and rechecking each phase of the study. In some cases, there was question about the inclusion or exclusion of some sections; that is, the section drawn on the BLM map straddled the inventory unit boundary. In a few instances, only the township and range were known because of imprecise recordings by the private owner; also, because the sections containing the acreages were unknown, aerial photography for those sections could not be identified. The total acreage involved in these cases was less than 2 percent of the total area.

Sampling error attendant to the various estimates of area classes results from a less than 100-percent inventory of the private lands on aerial photos and on the ground. If photo interpretation were exact (that is, if there were no question about the classification of an area by land and forest type), standard simple random sampling formulas would define the number of photo points needed to estimate areas by land and forest type within given error limits. By these formulas (if photo interpretation were exact), approximately 500 photo points over the total private acreage would produce estimates of timberland area that would be correct plus or minus 3 percent 9 times out of 10. But photo interpretation is not exact; to ensure that proper percentages of land and forest type categories be established, a much larger photo sample was used. Interpretation of the photos covering the sections with private acreages produced land and forest type information for 5,453 photo points; or one photo point for every 278 acres.

Even though a ground sample was used to adjust percentages of land in different land and forest type categories, there is still a sampling error associated with area estimates. The sampling error for the estimate of timberland area for all owners derived from the 1971-75 inventory was 4.2 percent per million acres. As major categories such as timberland are broken down into more specific categories, this sampling error increases.

Total privately owned acreage, including 74,825 acres of Census (Bureau of the Census, U.S. Department of Commerce) and non-Census water, as extracted from the BLM lists, is 1,514,850 acres. Based on the photo interpretation and adjustments derived from the ground sample, 280,634 acres of timberland in the Tanana unit are privately owned. Other breakdowns of private land are: marginal timberland-36,172; inoperable forest land-766,809 acres; and nonforest land-356,409 acres. Additional detailed breakdowns of these results are provided in the tables 1 to 4.

Table 1-Area by land class and owner, Tanana inventory unit, interior Alaska, 1984¹

LAND CLASS	OWNER				
	NATIVE ALASKAN	OTHER PRIVATE	TOTAL PRIVATE	PUBLIC	ALL OWNERS
	ACRES				
FOREST LAND:					
TIMBERLAND	235,117	45,517	280,634	1,914,045	2,194,680
MARGINAL TIMBERLAND	33,121	3,051	36,172	247,663	283,835
INOPERABLE FORESTLAND	716,068	50,741	766,809	8,079,341	8,846,150
TOTAL	984,306	99,309	1,083,615	10,241,049	11,324,664
NONFOREST LAND	316,723	39,686	356,409	1,414,659	1,771,068
ALL LANDS	1,301,029	138,995	1,440,024	11,655,708	13,095,732
CENSUS WATER	48,025	--	48,025	309,633	357,658
NON-CENSUS WATER	24,213	2,587	26,800	167,681	194,481
ALL CLASSES	1,373,268	141,582	1,514,850	12,133,021	13,647,872

¹Totals may be off because of rounding

Table 2-Area of timberland by survey block and owner, Tanana inventory unit, interior Alaska, 1984¹

SURVEY BLOCK	OWNER				
	NATIVE ALASKAN	OTHER PRIVATE	TOTAL PRIVATE	PUBLIC	ALL OWNERS
	ACRES				
KANTISHNA	4,512	362	4,874	419,366	424,240
FAIRBANKS	42,343	28,957	71,300	676,677	747,977
WOOD SALCHA	40,806	15,493	56,299	569,972	626,271
UPPER TANANA	147,456	705	148,161	248,030	396,191
ALL BLOCKS	235,117	45,517	280,634	1,914,045	2,194,680

¹Totals may be off because of rounding.

When the sampling and procedural errors are taken into account, the distribution of total, privately owned acreage into timberland and nontimberland categories is in error by no more than 15 percent. The total figure for privately owned land (1,514,850 acres) is not based on a sample, has no sampling error, and, given the 2-percent procedural error mentioned above, was true in March 1984.

Table 3-Area of timberland by owner, productivity class, and forest type, Tanana inventory unit, interior Alaska, 1984¹

OWNER	CUBIC-FOOT PRODUCTIVITY CLASS	FOREST TYPE						ALL TYPES
		BLACK SPRUCE	WHITE SPRUCE	BALSAM POPLAR	ASPEN	PAPER BIRCH	NON STOCKED	
ACRES								
NATIVE ALASKAN	85 AND MORE	--	--	--	--	--	--	--
	50 to 85	--	--	--	--	--	--	--
	LESS THAN 50	281	119,242	16,842	31,525	67,226	--	235,117
OTHER PRIVATE	85 AND MORE	--	--	--	--	--	--	--
	50 to 85	--	--	--	--	--	--	--
	LESS THAN 50	89	7,996	1,728	13,417	22,287	--	45,517
TOTAL PRIVATE	85 AND MORE	--	--	--	--	--	--	--
	50 to 85	--	--	--	--	--	--	--
	LESS THAN 50	370	127,238	18,570	44,942	89,513	--	280,634
PUBLIC	85 AND MORE	--	--	--	--	--	--	--
	50 to 85	--	--	--	--	4,999	--	4,999
	LESS THAN 50	42,961	625,381	65,846	358,567	794,420	21,872	1,909,046
ALL OWNERS	85 AND MORE	--	--	--	--	--	--	--
	50 to 85	--	--	--	--	4,999	--	4,999
	LESS THAN 50	43,331	752,619	84,416	403,509	883,933	21,872	2,189,680
TOTAL		43,331	752,619	84,416	403,509	888,932	21,872	2,194,680

¹Totals may be off because of rounding.

Table 4-Area of timberland by owner and stand-size class, Tanana inventory unit, interior Alaska, 1984¹

OWNER	STAND-SIZE CLASS				ALL CLASSES
	SAWTIMBER	POLETIMBER	SEEDLING AND SAPLING	NON- STOCKED	
			ACRES		
NATIVE ALASKAN	75,085	87,949	70,108	1,975	235,117
OTHER PRIVATE	9,170	16,981	18,606	760	45,517
TOTAL PRIVATE	84,255	104,930	88,714	2,735	280,634
PUBLIC	431,953	757,557	705,396	19,137	1,914,045
ALL OWNERS	516,208	862,487	794,110	21,872	2,194,680

¹Totals may be off because of rounding

Terminology¹

Census water—Streams, sloughs, estuaries, and canals more than one-eighth mile wide; and lakes, reservoirs, and ponds more than 40 acres in area. (Also see "Non-Census water.")

Forest land—Land at least 16.7 percent stocked by forest trees of any size or formerly having such tree cover, and not currently developed for nonforest use.

Forest types—A classification of forest land based on the species forming a plurality of the live tree stocking.

*Black spruce*² —Forests in which a plurality of the stand is black spruce. Black spruce most often occurs in nearly pure stands but can be found mixed with tamarack, white spruce, paper birch, and aspen. Black spruce is fairly characteristic of poorer forest land.

White spruce—Forests in which a plurality of the stand is white spruce. Common associates include paper birch and balsam poplar, and occasionally black spruce or quaking aspen.

Balsam poplar—Forests in which a plurality of the stand is balsam poplar. South of the Alaska Range balsam poplar may be replaced by black cottonwood or hybrids between the two. As the poplar ages it is sometimes replaced by white spruce; however, it is usually found as a nearly pure type with only an occasional white spruce or paper birch associate.

Paper birch—Forests in which a plurality of the stand is paper birch. Paper birch can occur in pure stands but is more often mixed with white spruce, quaking aspen, or black spruce.

Quaking aspen—Forests in which a plurality of the stand is aspen. Aspen is usually found as a pure type after fire and after a willow stage. As aspen ages it is usually replaced by spruce except on very dry sites where it may remain as a pure type. Common associates include black spruce and white spruce and occasionally paper birch.

Inoperable forest land—Nontimberland with a gross volume of less than 800 cubic feet per acre.

Land area—The area of dry land and land temporarily or partly covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in area.

Land class—A classification of land by major use, such as timberland, other forest, and nonforest. The minimum size area for classification is 1 acre.

¹Terminology is from the USDA Forest Service, Forest Service Handbook, Title 4813.1, 1967, and the manual of field instructions for the forest survey of the Tanana River Basin, Alaska, 1975.

²See "Names of Trees" for scientific names.

Marginal timberland—Nontimberland with a gross volume in excess of 800 cubic feet per acre.

Non-Census water—Streams, sloughs, estuaries, and canals between 120 feet and one-eighth mile wide; and lakes, reservoirs, and ponds between 1 and 40 acres in area. (Also see Census water.)

Nonforest land—Land that does not qualify as forest land. Includes land that has never supported forests and lands formerly forested where forest use is precluded by development for nonforest uses, such as crops, improved pasture, residential areas, and city parks. Also includes improved roads and certain areas of water classified by the Bureau of the Census as land. Unimproved roads, streams, canals, and nonforest strips in forest areas must be more than 120 feet wide, and clearings in forest areas must be more than 1 acre in size to qualify as nonforest land.

Nonstocked areas—Timberland less than 16.7 percent stocked with growing stock trees.

Nontimberland—Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions (producing less than 20 cubic feet per acre per year) and productive forest land withdrawn from commercial timber use through statute or administrative regulation.

Other forest land—Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions. This includes sterile or poorly drained forest land, subalpine forests, and steep rocky areas where topographic conditions are likely to prevent management for timber production indefinitely.

Poletimber stands—Stands at least 16.7 percent stocked with growing stock trees, of which half or more of this stocking is in poletimber and sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Productivity class—A classification of forest land in terms of potential growth in cubic feet of fully stocked natural stands.

Sawtimber stands—Stands at least 16.7 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Seedling-sapling stands—Stands at least 16.7 percent stocked with growing stock trees, of which more than half of the stocking is saplings and seedlings.

Stand-size classes—A classification of forest land based on size of the growing stock present; that is, sawtimber, poletimber, or saplings and seedlings.

Timberland—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. Areas qualifying as timberland have the capability of producing in excess of 20 cubic feet per acre per year (mean annual increment) of industrial wood under management.

Names of Trees³

Common name	Scientific name
Softwoods:	
Black spruce	<i>Picea mariana</i> (Mill.) B.S.R
Tamarack	<i>Larix laricina</i> (Du Roi) K. Koch
White spruce	<i>Picea glauca</i> (Moench) Voss
Hardwoods:	
Balsam poplar	<i>Populus balsamifera</i> L
Paper birch	<i>Betula papyrifera</i> Marsh.
Quaking aspen	<i>Populus tremuloides</i> Michx.

^{3/}Scientific names are according to Viereck and Little (1972).

Metric Equivalents

1 foot = 0.3048 meter
1 mile = 1.609 kilometers
1 acre = 0.4047 hectare
1 cubic foot = 0.0283 cubic meter

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The **Forest Service** of the U.S. Department of Agriculture is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives — as directed by Congress — to provide increasingly greater service to a growing Nation.

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Pacific Northwest Forest and Range
Experiment Station
319 S.W. Pine St.
PO Box 3890
Portland, Oregon 97208