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Timber Resource Statistics for the Chatham Area of the Tongass National Forest, Alaska, 1982

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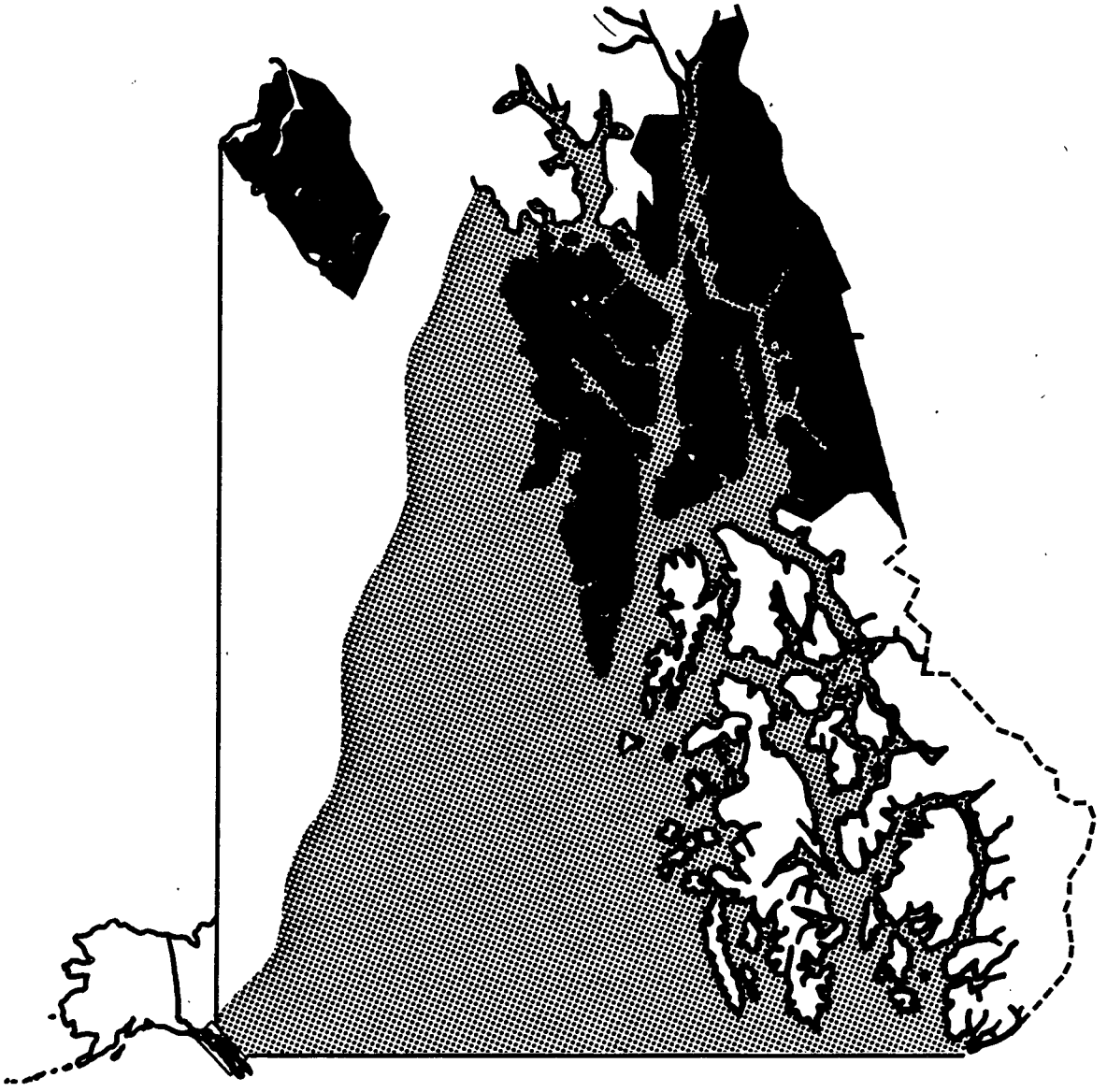

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Abstract

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Statistics on forest area, total gross and net volumes, and annual net growth and mortality are presented from the 1980-82 timber inventory of the Chatham Area, Tongass National Forest, Alaska. Available timberland area is estimated at 1.4 million acres, net growing stock volume at 7.2 billion cubic feet, and annual net growth and mortality at 35.9 and 54.8 million cubic feet, respectively.

Keywords: Forest surveys, timber inventory, statistics (forest), Alaska (southeast).

Summary

This report for the 8.1-million-acre Chatham Area timber inventory unit is one in a series of three reports for southeast Alaska. The Chatham Area is in the panhandle of southeast Alaska and includes Chichagof, Baranof, Douglas, and Admiralty Islands and other small islands. It is bounded on the north by Yakutat Bay, inland to the east by the United States-Canadian border, on the south by Frederick Sound, and on the west by the Pacific Ocean.

This is the second general reinventory of the forests in the Chatham Area unit, which was first inventoried in 1955-56 and 1958 and subsequently in 1970-71 and 1975 as three separate units. Remeasurement of the growth and mortality plots established in the first inventory was accomplished in 1964-65 and 1967 and again in 1970-71 and 1975. This set of growth and mortality plots was not considered representative by 1980 and was not remeasured a third time. The plots upon which estimates in this report are based were established, however, as permanent plots for remeasurement in the future. Growth and mortality figures in this report therefore are derived from temporary plots.

Estimates of forest area, total gross and net timber volumes, and annual net growth and mortality are presented from the 1980-82 inventory (hereafter referred to as the 1982 inventory) of the Chatham Area unit. Additional detailed breakdowns of these estimates are provided in tabular form.

Preface

The USDA Forest Service, under authority of the McSweeny-McNary Forest Research Act of 1928, the Renewable Resources Planning Act of 1974, and the Renewable Resources Research Act of 1976, conducts periodic inventories of all states. In Alaska, personnel of the Tongass National Forest, the Chugach National Forest, and the Pacific Northwest Research Stations's Forest Inventory and Analysis (FIA) unit in Anchorage, Alaska, have shared this responsibility.

Personnel of the Tongass National Forest were responsible for collecting and compiling necessary data; FIA personnel assisted with presentation of results shown in this series of reports.

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Highlights

	Available	Reserved	Total
		Thousand acres	
Total Chatham Area inventory unit:	4,448	3,695	8,143
Forest land	2,328	1,348	3,676
Nonforest land	2,047	2,296	4,343
Noncensus water	10	6	16
Census water	63	45	109
Forested area:			
Timberland	1,419	792	2,211
Other forest land	909	556	1,464
Timberland stand-size composition:			
Old-growth sawtimber	1,235	745	1,979
Young-growth sawtimber	88	36	124
Poletimber	30	10	39
Seedlings and saplings, and nonstocked	66	2	68
Timberland forest type composition:			
Alaska-cedar	0[a]	0	0
Cottonwood	38	17	55
Cottonwood-spruce	14	1	15
Hemlock[b]	455	401	856
Hemlock-spruce	755	340	1,095
Lodgepole pine	—	—	—
Red alder	6	0	6
Sitka spruce	148	32	180
Nonstocked	4	0	5

	All growing stock	Sawtimber growing stock
	Million cubic feet[c]	*Million board feet Scribner rule*[d]
Volume on available timberland:		
Gross volume	8,097	39,060
Net volume	7,247	32,100
Net annual growth	36	169
Annual mortality	55	229

	All growing stock	Sawtimber growing stock
	Million cubic feet[c]	*Million board feet Scribner rule*[d]
Volume on reserved timberland:		
Gross volume	4,817	23,448
Net volume	4,308	19,268
Net annual growth	21	101
Annual mortality	33	138
Volume on available other forest land:		
Gross volume	1,482	5,817
Net volume	1,354	4,781
Net annual growth	5	25
Annual mortality	15	34
Volume on reserved other forest land:		
Gross volume	907	3,558
Net volume	828	2,925
Net annual growth	3	15
Annual mortality	9	21

— = no data were collected.

[a] 0 = less than 500 acres.

[b] Includes western and mountain hemlock.

[c] Volume of roundwood for growing stock trees 5.0 inches in d.b.h. (diameter at breast height) and larger.

[d] Volume, Scribner rule (16-foot logs), for softwood trees 9.0 inches in d.b.h. and larger and for hardwood trees 11.0 inches in d.b.h. and larger.

Introduction

The Chatham Area unit is located between 132.20° and 136.30° W. longitude and between 56.11° and 59.42° N. latitude in the panhandle of southeast Alaska (fig. 1).

The climate of the Chatham Area is maritime. Temperatures range from about 0 °F in the winter to around 75 °F in the summer. Precipitation is moderate to heavy throughout the area, and winter snowfall can exceed 60 inches.

The topography of the Chatham Area unit is typical of southeast Alaska. It is characterized by tall peaks, fjords, narrow valleys, and numerous islands. This physical character affects community development and resource use. The steepness of the land limits community development to narrow, coastal benches. Resource use is tempered by accessibility and site-integrity considerations.

Inventory Procedures

The sampling design used to derive area and volume estimates from the 1980-82 Chatham Area timber inventory used a 100-percent vegetation and land type map as a base providing stratum areas. Fifty-five sampling units of about 250 acres each were located in these strata via PPS sampling methodology (sampling with probability proportional to size). These sampling units contained about 380 polygons classified as forest land. Forest land polygons were sampled on the ground with an intensity of one variable-radius plot per 5 acres. The map (completed in 1978) polygons were classified by land type, forest type, stand-size class, and volume class. Updates were made to reflect status changes in harvest, ownership, and availability that occurred up to 1982. Tree measurements taken within the ground plots served as the basis for the volume expansion to map strata.

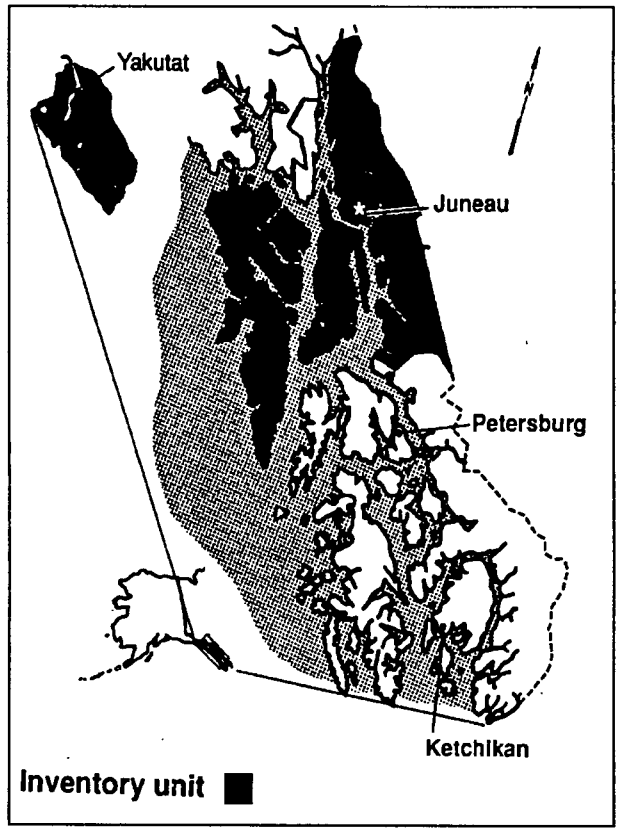

Figure 1–Chatham Area forest inventory unit, 1982

Ownership Statistics

In 1974, ownership of land other than that administered by the USDA Forest Service was incidental. Since that time, Federal legislation has effected significant land status changes associated with Alaska Native and State of Alaska selections and wilderness withdrawals. These land status changes are the result of the Alaska Statehood Act of 1958 (Public Law 85-508), the Alaska Native Claims Settlement Act (ANCSA) of 1971 (Public Law 92-203), and the Alaska National Interest Lands Conservation Act (ANILCA; Public Law 96-487). As of 1982, the following shifts in land status have occurred since 1974:

Changes in status	Acres
Native selections	125,414
State selections	45,079
Acquisition from the Bureau of Land Management	1,172,660
Wilderness withdrawals	3,694,545
Transfer to Glacier Bay National Park	64,075

Land acquisition from BLM included 209,665 acres of wilderness that also is included in "wilderness withdrawals."

Timber Harvesting

A summary of timber volumes cut in the Chatham Area of the Tongass National Forest from 1971 through 1981 is provided in table 11. The current Chatham Area unit boundary does not coincide with the inventories of the area in the 1970s, but the volume-cut figures provide a close approximation of the amount of logging activity occurring in the area.

Change in Standards and Methods Influences Inventory Estimates

Results obtained from resource inventories conducted at different times often are compared to examine the data for any trend information that may be present. Many factors influence comparability of estimates derived from two or more resource inventories that did not measure the sample by the same methods. For timber resource inventories, estimates of wood volume are important. An analyst making such a comparison must be aware not only of inventory design changes but also of volume computation changes.

Several changes were made to the volume computation procedures in the current inventory relative to the previous inventory. Changes were made in tree merchantability standards, cull tree determinations, and volume tables.

Merchantability standards changed between inventories in that the minimum breast-height diameter for sawtimber trees was lowered and the top diameters and stump heights were changed. Under the previous scheme, the break between poletimber-sized and sawtimber-sized trees was made at 11 inches for both softwoods and hardwoods, top diameters were at 40 percent of breast-height diameter for softwoods and 8 inches for hardwoods, and stump heights were variable. Under the current scheme, the break between poletimber and sawtimber is at 9 inches for softwoods and 11 inches for hardwoods. Current top diameters (inside bark) are 6 inches for softwoods, and 8 inches for hardwoods, and stump height is 1 foot. Previously, for a live tree to be classified as merchantable (noncull), it had to have one merchantable saw log; for softwood sawtimber, the tree had to be greater than 25 percent sound, board-foot measure (bfm), and for hardwoods greater than 50 percent sound, bfm. Poletimber trees, hardwood and softwood, had to be greater than 50 percent sound, cubic-foot measure. Currently, the requirements are simplified; any tree with at least one merchantable saw log is not cull.

Volume tables used to compute gross tree volumes also have changed. In the previous inventories several equations were used. These were developed by Embry and Haack (1965), Bones (1968), and Farr and LaBau (1971). Currently, equations developed by Bruce (1984) are used for all Sitka spruce and hemlock. The magnitude of the differences due to use of these equations is difficult to estimate without total recompilation of the previous inventory.

Table 1 presents differences in available timberland area and cubic-foot volume estimates (in trees greater than 5.0 inches in diameter at breast height and larger) that result from different inventories and methods of area expansion. Data are presented from inventories (hereafter referred to as "the 1970s inventories") done with consistent methods that were conducted in 1970 (LaBau and van Hees 1983), 1971 (van Hees and LaBau 1983), and 1975 (van Hees and LaBau 1984) on all lands in the Chatham Area (not just National Forest lands); the data are adjusted to reflect National Forest area only. Also presented are two sets of data from the current (1982) inventory. The 1982 estimates of per-acre volume are both about 12 percent lower than the 1970s estimate.

Table 1—Comparison of available timberland area and cubic-foot volume in trees 5.0 inches in diameter at breast height and larger by stand-size class, sawtimber-volume class, and type of inventory, Chatham Area unit, southeast coastal Alaska

Stand-size and sawtimber-volume classes	Inventory					
	Plot '70s		Map '82		Plot '82	
	Acres	*MMcf* [a]	*Acres*	*MMcf*	*Acres*	*MMcf*
Seedling and saplings, and nonstocked	54,534	8	66,007	26	50,170	25
Poletimber	9,528	11	29,608	58	26,371	32
Sawtimber-volume class:[b]						
Less than 8,000 board feet per acre	3,871	7	5,634	7	76,168	164
8,000-20,000	421,621	1,634	718,081	3,247	548,290	2,123
20,000-30,000	453,184	2,691	476,298	3,039	362,310	1,978
30,000-50,000	379,906	3,163	110,983	762	316,550	2,534
Greater than 50,000	51,230	558	12,211	107	38,963	467
Total	1,373,515	8,072	1,418,822	7,246	1,418,822	7,734
(Average volume per acre	5,877		5,107		5,162)	

[a] MMcf = million cubic feet.

[b] Net board feet, inventory Scribner volume, except base volume of 8,000 board feet, which is International 1/4-inch rule.

Area estimates from the 1970s inventories were developed through a double-sampling technique involving area expansion of plot-level information (Bickford 1952). Estimates in the column labeled "Map '82" (in table 1) were developed by summation of mapped polygon areas, whereas estimates in the column labeled "Plot '82" were developed via area expansion based on the stand exam inventory methods described earlier. Estimates presented in this report, other than those in table 1 that are labeled "Plot '70s" or "Plot '82," were developed through mapped-polygon summation.

Although faults (such as poor correlation between photo-interpreted map classification and ground-sample classification) have been found with the 100-percent timber type map as an in-place resource information source, it is considered an adequate tool for separating productive from unproductive forest land and seedlings, saplings, poletimber, and low-volume young-growth from the group of old-growth volume classes. Even though there is low reliability in locating a particular volume class on a polygon-by-polygon basis, the 100-percent type map has proven highly reliable in predicting volumes by sale or drainage. The acreages derived by plot expansion, rather than directly from the map, are considered more accurate. These acres cannot be tied to the entire map though.

Old Growth

Nearly 91 percent of the timberland sample plots in the Chatham Area unit were in uncut timber. In southeast Alaska, uncut implies old growth because of the dearth of extensive, historical logging activity. Recent efforts to develop accurate characterizations of old-growth forests point to many difficulties in creating consistent definitions, however. For this timber inventory, a definition was used that focuses only on the timber component of the forest.

Stands of trees 150 years old or older are designated as old growth. Rationale for this breakpoint derives from the natural course of wood fiber productivity over the life of the stand. As stands age, the average amount of wood grown annually (the mean annual increment [MAI]) changes. In the early stages of stand growth, the increment is larger than at later stages. In southeast Alaska, the culmination of MAI, for sawtimber-sized material, typically occurs at age 150 or earlier. At this point the stand is no longer "youthful." Thus, the designation of age 150 as the delineation between young growth and old growth.

Stand age is based on plurality of tree stocking per acre. If, for example, a stand has two age groups that are numerically adjacent, and that comprise more than 50 percent of the growing stock stocking of the stand, stand age is assigned to the age group of the pair having the greater stocking, and the stand is designated even-aged. Stands can be classified as even-aged beyond 300 years old, although 200 years is the upper age limit most commonly found. The few old, even-aged stands found during sampling generally resulted from fire, windthrow, or small village clearings.

Timber inventory crews generally do not attempt to age trees beyond 300 years. Farr and others (1976) examined 1,234 trees 11.0 inches and larger at breast height. They found average age at breast height to be 282 years in mixed hemlock and spruce stands. Three trees were more than 600 years old. The oldest tree in the study was 775 years old. The study by Farr and others (1976) indicated that trees more than 500 years old are not at all common.

Reliability of Inventory Data

All volume statistics reported here are estimates based on sampling and are subject to sampling error. Sampling errors for all estimates presented in the tables are available from the authors. The reliability of the inventory is expressed as relative sampling error at the 68-percent confidence level. Area statistics are generated directly from a vegetation-land type map and therefore are expressed without sampling error.

	Design sampling error	Sampling error achieved	Sampling error of the total estimate
		Percent	
Net growing stock volume on available timberland:			
Per billion cubic feet	10.0	10.1	
For the total 7,246,700,000 cubic feet			3.8
Net growing stock volume on available other forest land:			
Per billion cubic feet	15.0	14.5	
For the total 1,354,400,000 cubic feet			12.5
Net growth of growing stock on available timberland:			
Per billion cubic feet	10.0	4.3	
For the total 35,900,000 cubic feet			22.5
Net growth of growing stock on available other forest land:			
Per billion cubic feet	15.0	3.3	
For the total 5,300,000 cubic feet			45.8

For the Chatham Area inventory unit, growing stock volume on available timberland was estimated at 7.247 billion cubic feet, ± 3.8 percent, with 68-percent confidence limits of 6.975 and 7.518 billion cubic feet. A 68-percent confidence level means that if repeated samples were taken of this population, the estimate of total volume would be between 6.975 and 7.518 billion cubic feet 68 percent of the time.

Goals for the design sampling error were slightly exceeded for net volume on available timberland. Area estimates are derived from vegetation-land type maps, which are assumed to have no error.

Terminology[1]

Available timberland—Timberland not withdrawn from use in production of timber products as a result of administrative statute or regulation.

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

Forest land—Land at least 10.0 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 cottonwood—Forests in which a plurality of the stand is black cottonwood. Black cottonwood is found south of the Alaska Range in pure stands along the major rivers.

Cedar—Forests in which a plurality of the stand is Alaska-cedar or western redcedar, either in combination or individually. Associates include mountain or western hemlock, lodgepole pine, and occasionally Sitka spruce, red alder, and cottonwood.

Hemlock-spruce—Forests in which 50 percent or more of the stand is western or mountain hemlock and where Sitka spruce comprises 30-49 percent of the stocking.

Lodgepole pine—Forests in which a plurality of the stand is lodgepole pine. Common associates are mountain and western hemlock and Alaska-cedar.

Mountain hemlock—Forests in which a plurality of the stand is mountain hemlock. An associated species is western hemlock.

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.

Red alder—Forests in which a plurality of the stand is red alder. Common associates are black cottonwood, Sitka spruce, western hemlock, and occasionally western redcedar or Alaska-cedar, or both.

Sitka spruce—Forests in which a plurality of the stand is Sitka spruce. An associated species is western hemlock.

Western hemlock—Forests in which a plurality of the stand is western hemlock. Common associates include Sitka spruce, Alaska-cedar, western redcedar, mountain hemlock, and occasionally cottonwood, red alder, or lodgepole pine.

Growing stock trees—Sawtimber trees, poletimber trees, saplings, and seedlings; that is, all live trees except cull trees.

Growing stock volume—The net volume of sound wood in the bole of growing stock trees 5.0 inches and larger in d.b.h. (diameter at breast height), from stump to a minimum 4.0-inch top, outside bark, or to the point where the central stem breaks into limbs.

[1] Terminology is from USDA Forest Service, Forest Service Handbook, Title 4813.1, 1967; and the manual of field instructions for the forest survey of the Chatham Area unit.

Hardwoods—Broad-leaved trees that are usually deciduous. "Commercial" Alaska hardwood species are balsam poplar, black cottonwood, paper birch, quaking aspen, and occasionally red alder.

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 5 acres 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 5 acres.

Mean annual increment (MAI)—A measure of the volume of wood, in cubic feet, produced on 1 acre during 1 year. Forest Inventory and Analysis minimum standard for timberland is the ability to produce 20 cubic feet per acre per year.

Merchantable tree—A merchantable tree must be producing or be capable of producing at least one merchantable saw log that is at least 50 percent sound for hardwoods or 33 percent sound for softwoods, board-foot measure. All poletimber less than 50 percent sound, cubic-foot measure, and all saplings with any sign of rot are not considered merchantable trees but rotten culls. Trees of such poor form that they will never produce a merchantable saw log are not classified as merchantable trees but as sound culls or rough trees.

Mortality—Number or sound wood volume of live trees dying from natural causes during a specified period.

Net annual growth of growing stock—The annual change in net volume of sound wood in live sawtimber and poletimber trees.

Net annual growth of sawtimber—The annual change in net board-foot volume of live sawtimber trees.

Net volume—The gross volume of a tree less deductions for rot, sweep, or other defect affecting product use.

Noncensus water—Streams, sloughs, estuaries, and canals between 120 feet and one-eighth of a mile wide; and lakes, reservoirs, and ponds between 5 and 40 acres in area. (*Also see* census water.)

Nonforest land—Land not qualifying as forest land. Includes land that never has 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 5 acres in size to qualify as nonforest land.

Nonstocked areas—Timberland less than 10.0 percent stocked with growing stock trees.

Other forest land—Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions (producing less than 20 cubic feet MAI). This includes sterile or poorly drained forest land, subalpine forests, and steep rocky areas where topographic conditions are likely to prevent indefinitely management for timber production.

Poletimber-sized tree—Softwood tree 5.0 to 8.9 inches in d.b.h.; hardwood tree from 5.0 to 10.9 inches in d.b.h.

Poletimber stands—Stands at least 10.0 percent stocked with growing stock trees of which half or more are in poletimber- and sawtimber-sized trees, with poletimber stocking exceeding that of sawtimber.

Rough trees—Live trees 5.0 inches and larger in d.b.h. that do not contain a saw log, now or prospectively, primarily because of roughness or poor form, or because they are a noncommercial species.

Rotten trees—Live trees 5.0 inches and larger in d.b.h. that do not contain a saw log, now or prospectively, primarily because of rot.

Salvable dead trees—Standing or down dead trees currently considered merchantable by regional standards. A poletimber tree must be more than one-half sound; a sawtimber tree more than one-third sound (board measure).

Sapling-sized tree—A tree 1.0 to 4.9 inches in d.b.h.

Saw log—A log meeting minimum standards of diameter, length, and defect, including logs at least 12 feet long for softwoods (8 feet for hardwoods), sound and straight, and with a minimum small-end diameter inside bark of 6 inches for softwoods (8 inches for hardwoods).

Saw-log portion—That part of the bole of sawtimber trees between the stump and the saw-log top.

Saw-log top—The point on the bole of sawtimber trees above which a saw log cannot be produced. The minimum saw-log top is 7.0 inches d.o.b. (diameter outside bark) for softwoods and 9.0 inches d.o.b. for hardwoods.

Sawtimber-sized tree—Softwood tree 9.0 inches d.b.h. and larger; hardwood tree 11.0 inches in d.b.h. and larger.

Sawtimber stands—Stands at least 10.0 percent stocked with growing stock trees, with half or more of total stocking in sawtimber- or poletimber-sized trees, and with sawtimber stocking at least equal to poletimber stocking.

Sawtimber volume—Net volume of sawtimber trees measured in board feet.

Scribner rule—The common board-foot timber scaling rule used locally in determining volume of sawtimber. Standing inventory volume is based on 16-foot logs.

Seedling-sapling stands—Stands at least 10.0 percent stocked with growing stock trees of which more than half of the stocking is saplings and seedling-sized trees.

Seedling-sized tree—An established tree less than 1.0 inch d.b.h.

Site productivity class—A classification of forest land based on capacity to grow crops of industrial wood.

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

Stocking—The degree of occupancy of land by trees, measured either by basal area or by the number of trees in a stand by size or age and spacing, compared with the basal area or number of trees required to fully use the growth potential of the land; that is, the stocking standard.

Timberland—Forest land producing or capable of producing crops of industrial wood. Areas qualifying as timberland can produce 20 cubic feet per acre per year of industrial wood at culmination of mean annual increment.

Tree size class—A classification based on the diameter of the tree at breast height (4-1/2 feet above the ground on the uphill side of the tree).

Unclassified land—Locations that could not be classified on aerial photography for various reasons including cloud cover or shadow.

Upper stem portion—That part of the main stem or fork of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the main stem or fork breaks into branches.

Names of Trees[2]

Common name	Scientific name
Softwoods:	
Alaska-cedar	*Chamaecyparis nootkatensis* (D. Don) Spach
Lodgepole pine	*Pinus contorta* Dougl.
Mountain hemlock	*Tsuga mertensiana* (Bong.) Carr.
Sitka spruce	*Picea sitchensis* (Bong.) Carr.
Subalpine fir	*Abies lasiocarpa* (Hook.) Nutt.
Western hemlock	*Tsuga heterophylla* (Raf.) Sarg.
Western redcedar	*Thuja plicata* Donn
Hardwoods:	
Black cottonwood	*Populus trichocarpa* Torr. & Gray
Red alder	*Alnus rubra* Bong.

[2] Scientific names are according to Viereck and Little (1972).

Tables

Estimates in this report were developed from statistically based samples and therefore are subject to sampling error. Sampling errors for estimates of various resource quantities are presented in the section, "Reliability of Inventory Data."

Table 2—Area of forest land by forest type and land class, Chatham Area unit, southeast coastal Alaska, 1982

Forest type	Land class				All classes
	Timberland		Other forest land		
	Available	Reserved	Available	Reserved	
	Thousand acres				
Softwoods:					
Alaska-cedar	0[a]	0	209	128	338
Lodgepole pine	—	—	2	1	4
Hemlock[b]	455	401	479	293	1,628
Hemlock-spruce	755	340	30	18	1,143
Sitka spruce	148	32	35	21	236
Total	1,357	774	756	462	3,353
Hardwoods:					
Black cottonwood	38	17	37	23	114
Cottonwood-spruce	14	1	5	3	22
Red alder	6	0	2	1	10
Willow	—	—	6	3	10
Total	57	18	51	30	154
Nonstocked	4	0	102	63	169
All types	1,419	792	908	555	3,676

— = no data were collected.

Totals may be off because of rounding.

[a] 0 = less than 500 acres.

[b] Includes mountain and western hemlock.

Table 3—Number of growing stock trees on available timberland by species and diameter class, Chatham Area unit, southeast coastal Alaska, 1982

Species	Diameter class (inches)								All classes
	Seedlings less than 1.0	1.0-4.9	5.0-8.9	9.0-12.9	13.0-16.9	17.0-20.9	21.0-28.9	29.0+	
	Thousand trees								
Softwoods:									
Alaska-cedar	206,542	23,168	7,879	4,978	3,685	1,823	1,702	629	250,406
Lodgepole pine	3,576	214	89	130	162	39	—	—	4,210
Mountain hemlock	589,450	46,715	19,337	8,872	6,753	3,455	2,345	805	677,732
Western hemlock	4,461,312	118,842	45,328	25,172	14,628	9,576	11,397	5,383	4,691,638
Sitka spruce	696,792	49,369	12,657	8,023	5,448	3,462	4,255	3,363	783,369
Subalpine fir	36,246	1,917	—	—	81	—	—	—	38,244
Total	5,993,918	240,225	85,290	47,175	30,757	18,355	19,699	10,180	6,445,599
Hardwoods:									
Black cottonwood	9,722	437	2,757	2,249	2,015	942	301	37	18,460
Red alder	1,294	—	—	154	109	52	—	—	1,609
Total	11,016	437	2,757	2,403	2,124	994	301	37	20,069
All species	6,004,934	240,662	88,047	49,578	32,881	19,349	20,000	10,217	6,465,668

— = no data were collected.
Totals may be off because of rounding.

Table 4—Net volume of timber on available timberland by class of timber and by softwoods and hardwoods, Chatham Area unit, southeast coastal Alaska, 1982

Class of timber	Softwoods	Hardwoods	All classes
	Million cubic feet		
Sawtimber trees:			
Saw-log portion	6,835	112	6,947
Poletimber trees	281	19	300
All growing stock	7,116	131	7,247
Cull trees	133	11	143
Salvable dead trees	377	4	381
All timber	7,626	145	7,771

Totals may be off because of rounding.

Table 5—Net volume of sawtimber, Scribner rule, on available timberland by species and diameter class, Chatham Area unit, southeast coastal Alaska, 1982

Species	Diameter class (inches) 9.0-12.9	13.0-16.9	17.0-20.9	21.0-28.9	29+	All classes
	Million board feet					
Softwoods:						
Alaska-cedar	221	327	226	333	128	1,236
Lodgepole pine	3	17	8	—	—	28
Mountain hemlock	250	642	754	1,064	1,054	3,763
Western hemlock	1,151	1,840	2,335	5,333	5,708	16,366
Sitka spruce	348	773	971	2,565	5,630	10,287
Subalpine fir	—	10	—	—	—	10
Total	1,973	3,608	4,293	9,295	12,520	31,690
Hardwoods:						
Black cottonwood	32	130	148	69	22	401
Red alder	—	4	6	—	—	10
Total	32	134	154	69	22	410
All species	2,004	3,742	4,448	9,364	12,542	32,100

— = no data were collected.

Totals may be off because of rounding.

Table 6—Net volume of growing stock, on available timberland by species and diameter class, Chatham Area unit, southeast coastal Alaska, 1982

Species	Diameter class (inches) 5.0-8.9	9.0-12.9	13.0-16.9	17.0-20.9	21.0-28.9	29+	All classes
	Million cubic feet						
Softwoods:							
Alaska-cedar	29	59	85	55	80	30	338
Lodgepole pine	1	1	5	2	—	—	8
Mountain hemlock	43	102	180	182	239	217	963
Western hemlock	159	367	465	631	1,127	1,115	3,764
Sitka spruce	50	114	182	206	502	986	2,040
Subalpine fir	—	—	3	—	—	—	3
Total	281	643	918	976	1,949	2,348	7,116
Hardwoods:							
Black cottonwood	8	23	40	35	15	4	125
Red alder	—	2	2	2	—	—	5
Total	8	25	42	37	15	4	131
All species	289	668	961	1,013	1,964	2,352	7,247

— = no data were collected.

Totals may be off because of rounding.

Table 7—Net annual growth of growing stock on available timberland by species and stand-size class, Chatham Area unit, southeast coastal Alaska, 1982

Species	Stand-size class			All classes
	Seedling and sapling	Poletimber	Sawtimber	
	Thousand cubic feet			
Softwoods:				
Alaska-cedar	3	—	1,292	1,295
Lodgepole pine	—	—	197	197
Mountain hemlock	—	—	7,536	7,536
Western hemlock	—	—	13,438	13,438
Sitka spruce	1,899	1,082	8,628	11,609
Subalpine fir	—	—	36	36
Total	1,902	1,082	31,126	34,111
Hardwoods:				
Black cottonwood	242	612	815	1,669
Red alder	—	—	139	139
Total	242	612	815	1,669
All species	2,144	1,694	32,081	35,919

— = no data were collected.

Totals may be off because of rounding.

Table 8—Net annual growth of sawtimber, Scribner rule, on available timberland by species and stand-size class, Chatham Area unit, southeast coastal Alaska, 1982

Species	Stand-size class			All classes
	Seedling and sapling	Poletimber	Sawtimber	
	Thousand board feet			
Softwoods:				
Alaska-cedar	—	—	3,445	3,445
Lodgepole pine	—	—	765	765
Mountain hemlock	—	—	34,313	34,313
Western hemlock	—	—	85,969	85,969
Sitka spruce	2,627	3,915	30,925	37,466
Subalpine fir	—	—	196	196
Total	2,627	3,915	155,613	162,155
Hardwoods:				
Black cottonwood	337	1,879	3,715	5,931
Red alder	—	—	395	395
Total	337	1,879	4,110	6,326
All species	2,964	5,793	159,723	168,481

— = no data were collected.

Totals may be off because of rounding.

Table 9—Average annual mortality of timber, on available timberland by species and type of volume, Chatham Area unit, southeast coastal Alaska, 1982

Species	Type of volume	
	Cubic foot	Board foot[a]
	Thousand feet	
Softwoods:		
Alaska-cedar	1,846	6,470
Lodgepole pine	—	—
Mountain hemlock	5,028	15,635
Western hemlock	32,488	118,960
Sitka spruce	14,849	86,011
Subalpine fir	—	—
Total	54,211	227,076
Hardwoods:		
Black cottonwood	564	1,759
Red alder	—	—
Total	564	1,759
All species	54,775	228,835

— = no data were collected.

Totals may be off because of rounding.

[a] Scribner volume based on 16-foot logs.

Table 10—Average per-acre characteristics of sawtimber-volume strata (map classified) for timber 9.0 inches in diameter at breast height and larger on available timberland, Chatham Area unit, southeast coastal Alaska, 1982

Per-acre characteristic	Sawtimber-volume stratum[a]			
	8,000-19,999	20,000-29,999	30,000-49,999	50,000+
Number of trees	108	105	78	63
Basal area (square feet)	195	220	241	250
Quadratic-mean tree diameter (inches)	18.2	19.6	23.8	27.0
Average height of the 40 largest diameter trees (feet)	70	80	87	92
Percent volume-defect (Scribner rule)	17.4	18.7	16.8	10.7
Species distribution of total volume (Scribner rule) in percent:				
Alaska-cedar	7.9	1.3	—	—
Sitka spruce	30.8	30.1	34.1	98.7
Lodgepole pine	0.2	—	—	—
Subalpine fir	0.1	—	—	—
Western hemlock	41.1	60.8	65.0	2.3
Mountain hemlock	20.0	7.8	0.9	—
Hardwoods[b]	—	0.1	—	—
Live-tree volume (Scribner rule)	18,742	29,286	33,938	44,977
Merchantable-dead tree volume (Scribner rule)	774	1,369	3,094	946

— = no data were collected.

[a] Net board feet, inventory Scribner volume, except base volume of 8,000 board feet which is International 1/4-inch rule.

[b] Hardwood volume is incidental to softwood forest types; volume in hardwood types is not referenced in this table.

Table 11—Summary of timber harvest, Scribner rule, Chatham Area unit, southeast coastal Alaska, 1971-81[a]

Year of harvest	Volume scaled, Scribner rule[b]	Inventory volume, Scribner rule[c]
	Thousand board feet	
1971	126,228	165,737
1972	137,099	180,011
1973	144,885	190,234
1974	106,650	140,031
1975	105,501	138,523
1976	118,548	155,654
1977	142,891	187,616
1978	109,996	144,427
1979	138,958	182,452
1980	99,819	131,062
1981	98,251	129,004
Total	1,328,826	1,744,751

[a] Before 1977, utility volume (chippable volume in saw-log-sized logs not otherwise qualifying as saw logs) was included with growing stock volume, and before 1974, volumes shown are estimated from records that included the Stikine Area (Rogers and van Hees 1991).

[b] Scribner rule, Bureau scale.

[c] Inventory volume = Scribner, Bureau scale volume × 1.3130.

Metric Equivalents

1 inch = 2.54 centimeters

1 foot = 0.3048 meter

1 acre = 0.4047 hectare

1 cubic foot = 0.0283 cubic meter

1 cubic foot per acre = 0.07 cubic meter per hectare

1 mile = 1,609 kilometers

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Rogers, George; van Hees, Willem W.S. 1991. Timber resource statistics for the Chatham Area of the Tongass National Forest, Alaska, 1982. Resour. Bull. PNW-RB-186. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 20 p.

Statistics on forest area, total gross and net volumes, and annual net growth and mortality are presented from the 1980-82 timber inventory of the Chatham Area, Tongass National Forest, Alaska. Available timberland area is estimated at 1.4 million acres, net growing stock volume at 7.2 billion cubic feet, and annual net growth and mortality at 35.9 and 54.8 million cubic feet, respectively.

Keywords: Forest surveys, timber inventory, statistics (forest), Alaska (southeast).

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