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FOREST AREA AND TIMBER RESOURCE STATISTICS FOR THE TAOS-RIO ARRIBA WORKING CIRCLE, NEW MEXICO, 1977

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RESEARCH SUMMARY

This bulletin presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Resources Evaluation standards.

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FOR THE
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TAOS - RIO ARRIBA

INTRODUCTION

This Resource Bulletin presents the principal findings of the second forest inventory of State and private lands in Taos and Rio Arriba Counties, New Mexico. Fieldwork began in July 1977 and was completed in November 1977. This bulletin does not note changes and trends since the statewide inventory of 1966. The 1966 inventory did not sample Taos and Rio Arriba Counties intensively and did not report findings at the working-circle level.

Originally, Resources Evaluation (formerly Forest Survey) was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978. The primary objective of Resources Evaluation, which is a continuing nationwide undertaking conducted by the USDA Forest Service, is to provide an assessment of the renewable resource situation on the Nation's forest and rangelands. Fundamental to the accomplishment of this objective are the state by state resource inventories which are conducted periodically.

The resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, and western South Dakota are administered through the Intermountain Forest and Range Experiment Station, headquartered in Ogden, Utah. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and removals. These data, when combined with similar information on Federal lands, provide a basis for the formulation of forest policies and programs and for the orderly development and use of the resources.

The two-county area covered by this report is one of 11 working circles in New Mexico. Similar reports have been issued for Santa Fe, San Miguel, and Colfax County Working Circles. Comparable reports will be issued as the statewide inventory continues.

The Intermountain Station gratefully acknowledges the cooperation of the New Mexico Department of State Forestry and State and Private Forestry (USDA Forest Service, Southwestern Region). Appreciation is also expressed for the cooperation of other public agencies and private landowners in providing information and access to the sample locations.

NEW MEXICO

Figure 1.--Taos-Rio Arriba Working Circle, New Mexico.

HIGHLIGHTS

Area

- The forest land area is 652 thousand acres (264 thousand hectares), or 36 percent, of the total State and private land area in the Working Circle (fig. 2).
- Of the forest land, 293 thousand acres (119 thousand hectares), or 45 percent, is classified as commercial timberland.
- Private ownership accounts for 279 thousand acres (113 thousand hectares), or 95 percent, of the commercial timberland.
- The predominant forest types are spruce-subalpine fir, aspen, ponderosa pine, and Douglas-fir; they occupy 89 percent of the commercial timberland. The remaining area consists of white fir, cottonwood, and pinyon-juniper.¹
- About half of the commercial timberland is in the 20 to 49 cubic foot productivity class, 94 percent of which is privately owned.

Figure 2.--Taos and Rio Arriba Counties; total land area by owner. The data presented in this report are for State and private lands only.

¹The area occupied by pinyon-juniper forest type classified as commercial is so classified because the site index for other associated species on these stands (usually ponderosa pine or Douglas-fir) was high enough to indicate a site potential productivity level exceeding 20 cubic feet per acre per year average annual growth, and nonstockable indicators were not present in sufficient quantities to lower the yield capability below 20 cubic feet per acre per year. Although pinyon/juniper usually occurs on unproductive forest land, when it occurs in mixtures with other species on productive sites, it is reported in the commercial timberland statistics.

Inventory

- Growing stock volume amounts to 315 million cubic feet (9 million cubic meters) and sawtimber volume totals 1,070 million board feet.²
- Rough, rotten, and salvable dead trees comprise 35 million cubic feet (1 million cubic meters), or 10 percent, of the total timber volume.
- The largest share of the total growing stock volume is made up of Engelmann spruce (38 percent) and aspen (22 percent). Subalpine fir, ponderosa pine, Douglas-fir, white fir, limber pine, pinyon/juniper, and cottonwood accounted for the remaining volume.
- Private owners control 96 percent of the total growing stock and sawtimber volume.

Growth and Mortality

- Net annual growth totals 8,911 thousand cubic feet (252 thousand cubic meters). Growth and mortality were not measured for pinyon and juniper trees.
- About 96 percent of the total net growth is on private lands.
- The annual mortality of 692 thousand cubic feet (20 thousand cubic meters) offsets 7 percent of the gross annual growth.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and Working Circle levels. Procedures were as follows:

1. Initial area estimates were based on the classification of 11,483 sample points systematically placed on maps and on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo points, adjusted to meet known land areas, were used to compute area expansion factors for the field stratum means.

2. Land classification and estimates of timber characteristics and volume were based on observation and measurements recorded at 228 ground sample locations (10-point cluster plot) distributed systematically over the land within each field stratum. Sample trees were selected on a fixed plot (1/300 acre for trees less than 5 inches d.b.h.) and with a 40 BAF variable plot for trees larger than 5 inches d.b.h.

3. Equations prepared from detailed measurements collected on standing trees throughout the Southwest were used to compute the volume and defect of individual tally trees.

4. All photo and field data were sent to Ogden, Utah, for editing and were punched onto cards and stored for machine computing, sorting, and tabulation. Final estimates were based on statistical summaries of the data.

²International 1/4-inch rule.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes, and so result in high sampling errors. The standard percents shown in tables 1 and 2 were calculated at the 67 percent confidence level.

Table 1.--*Area of forest land and percent standard error for the Taos-Rio Arriba Working Circle, 1977*

Item	Softwood types		Hardwood types		All types	
	Percent:		Percent:		Percent	
	Acres	standard:	Acres	standard:	Acres	standard
		error		error		error
Commercial timberland	228,573	5.4	64,799	14.8	293,372	4.1
Other forest land:						
Unproductive reserved	--	--	--	--	--	--
Unproductive nonreserved	216,671	21.0	141,932	28.2	358,603	11.2

Table 2.--*Net volume and net annual growth and annual mortality of growing stock and sawtimber on commercial timberland, with percent standard error for the Taos-Rio Arriba Working Circle, 1977*

Item	Softwoods		Hardwoods		All species	
	Percent:		Percent:		Percent	
	Volume	standard:	Volume	standard:	Volume	standard
		error		error		error
Net volume:						
Growing stock (M cubic feet)	242,549	7.0	72,775	15.7	315,324	6.7
Sawtimber (M board feet ¹)	921,275	7.4	148,651	23.3	1,069,926	7.0
Net annual growth:						
Growing stock (cubic feet)	6,844,938	8.0	2,066,278	18.7	8,911,216	7.9
Sawtimber (board feet ¹)	31,292,661	9.6	8,206,279	32.7	39,498,940	10.5
Annual mortality:						
Growing stock (cubic feet)	423,340	25.2	268,565	52.5	691,905	27.6
Sawtimber (board feet ¹)	1,416,853	28.5	516,609	60.6	1,933,462	25.5

¹International 1/4-inch rule.

TERMINOLOGY AND DATA TABLES

The following section contains definitions that are relevant to the timber resource data presented in this resource bulletin. Forest area and timber resource data for the Taos-Rio Arriba Working circle, New Mexico, are displayed in tables 3 through 23.

TERMINOLOGY

Land and Water

Land area.--The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area (Bureau of the Census definition).

Census water.--As defined by the Bureau of the Census, streams, sloughs, estuaries, and canals more than 1/8 of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

Noncensus water.--The same as defined by the Bureau of the Census, except minimum width of streams, etc., is 120 feet and minimum size of lakes, etc., is 1 acre.

Land Use Classes

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

Commercial timberland.--Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Note: Areas qualifying have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.)

Productive-reserved forest land.--Forest land sufficiently productive to qualify as commercial timberland, but withdrawn from timber utilization through statute, administrative designation, or exclusive use for Christmas tree production.

Other forest land.--(1) Forest land incapable of producing 20 cubic feet per acre of industrial wood under management, because of adverse site conditions; (2) unproductive-reserved forest land.

Nonforest land.--Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses.

Ownership Classes

National Forest land.--Federal lands legally designated as National Forest or purchase units, and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management lands.--Federal lands administered by the Bureau of Land Management.

Indian lands.--Tribal lands held in fee by the Federal Government, but administered for Indian tribal groups and Indian trust allotments.

State lands.--Lands owned by States, or lands leased to these governmental units for 50 years or more.

County and municipal lands.--Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Forest industry lands.--Lands owned by companies or individuals operating wood-using plants.

Farmer-owned lands.--Lands owned by farm operators. (Note: These exclude lands leased by farm operators from nonfarm owners, such as railroad companies and States.)

Miscellaneous Federal lands.--Federal lands other than the following: (1) National Forest lands; (2) lands administered by the Bureau of Land Management; and (3) Indian lands.

Miscellaneous private lands.--Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

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

Forest trees.--Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

Commercial species.--Tree species presently or prospectively suitable for industrial wood products.

Softwood.--Coniferous trees, usually evergreen, having needles or scalelike leaves.

Hardwoods.--Dicotyledonous trees, usually broad-leaved and deciduous.

Area Condition Classes

Stocking.--Stocking is an effort to express the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. "Percent of stocking" is synonymous with "percentage of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

"Stocking percentages" express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of the normal yield table values has been used to establish the lower limit of this range which represents full-site occupancy. This is called 100-percent stocking. The upper limit of full stocking has been set at 132 percent. Sites with less than 100-percent stocking represent understocking with less than full-site occupancy. Overstocking is characterized by sites that have over 133 percent stocking.

Class 10.--Area fully stocked (100-132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20.--Area fully stocked with desirable trees, but overstocked with all live trees.

Class 30.--Areas medium to fully stocked (60-99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and (or) inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.--Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and (or) conditions that ordinarily prevent occupancy by desirable trees.

Class 50.--Areas poorly stock (16.7-59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.--Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.--Areas nonstocked (less than 16.7 percent) or poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.--Low-risk old-growth stands.

Class 90.--High-risk old-growth stands.

Nonstocked.--Areas less than 16.7 percent stocked with growing stock trees.

Class of Timber

Growing stock trees.--Live trees of commercial species qualifying as desirable or acceptable trees. (Note: Excludes rough, rotten, and dead trees.)

Desirable trees.--Growing stock trees (a) having no serious defect in quality limiting present or prospective use for timber products; (b) of relatively high vigor; and (c) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable trees.--Growing stock trees that meet specified standards of size and quality, but not qualifying as desirable trees.

Rough trees.--(1) Live trees of commercial species that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet long or longer, now or prospectively, and (or) do not meet Rocky Mountain Regional specifications for freedom from defect primarily because of roughness or poor form; (2) all live trees of non-commercial species.

Rotten trees.--Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet long or longer, now or prospectively, and (or) do not meet Rocky Mountain Regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Cull.--Portions of a tree that are unusable for industrial wood products because of rot, form, or other defect.

Salvable dead trees.--Standing or down dead trees that are considered merchantable by Rocky Mountain Regional standards.

Mortality trees.--Trees formerly growing stock, dying from natural causes during a specified period, usually 1 year.

Saw-log portion.--That part of the bole of sawtimber trees between the stump and the saw-log top. A 1-foot stump is used.

Upper-stem portion.--That part of the bole 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 central stem breaks into limbs, whichever occurs first.

Tree Size Classes

Seedlings.--Live trees less than 1.0 inch in diameter at breast height.

Saplings.--Trees 1.0-4.9 inches in diameter at breast height.

Poletimber trees.--Trees at least 5.0 inches in d.b.h., but smaller than sawtimber size.

Sawtimber trees.--Trees exceeding poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9.0 inches, and 11.0 inches for hardwoods.

Volume

Net volume.--Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

Growing stock volume.--Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber volume.--Net volume in board feet of sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Growth and Mortality

Net annual growth.--The increase in net growing stock volume of a specified size class for a specific year. (Note: Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.)

Mortality.--Number or sound-wood volume of growing stock trees dying from natural causes during a specified period.

Site

Site class.--A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Site classifications are based upon the mean net annual growth of growing stock (not including thinnings or mortality loss) attainable at culmination of mean net annual growth over age. Height-age relationships are usually used as indicators of the specified volume-site class.

Stand-Size Classes

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.

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

Sapling-seedling stands.--Stands at least 16.7 percent stocked with growing stock trees in which more than half of the stocking is saplings and (or) seedlings.

Nonstocked land.--Commercial timberland less than 16.7 percent stocked with growing stock trees.

FOREST SURVEY TABLES

Table 3.--*Total area in the Taos-Rio Arriba Working Circle by ownership class, 1977*

Ownership class	Acres	Hectares
National Forest	1,894,376	766,630
Bureau of Land Management	740,422	299,639
Indian	757,236	306,444
State	261,083	105,657
Private	1,529,987	619,166
Total land area	5,183,104	2,097,536
Census water	26,432	10,697
Gross area ¹	5,209,536	2,108,233

¹U.S. Bureau of the Census, land and water area of the United States, 1970.

Table 4.--*Land area in the Taos-Rio Arriba Working Circle by major land class and ownership class, 1977*

Land class	Ownership class			
	State		Private	
	Acres	Hectares	Acres	Hectares
Commercial timberland	14,654	5,930	278,718	112,794
Productive reserved	--	--	--	--
Other forest land:				
Unproductive reserved	--	--	--	--
Unproductive nonreserved	64,928	26,276	293,675	118,846
Total forest land	79,582	32,206	572,393	231,640
Nonforest land	181,501	73,451	957,594	387,526
Total land area	261,083	105,657	1,529,987	619,166

Table 5.--Area of commercial timberland in the Taos-Rio Arriba Working Circle
by forest type, stand-size class, and site class; State owned, 1977

Forest type and stand-size class	Site class				All classes
	120+	85-119	50-84	20-49	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	--	342	902	1,244
Poletimber	--	--	--	222	222
Sapling and seedling	--	--	235	109	344
Nonstocked	--	--	--	235	235
Total	--	--	577	1,468	2,045
Ponderosa pine:					
Sawtimber	--	--	1,057	2,640	3,697
Poletimber	--	--	184	--	184
Sapling and seedling	--	--	--	94	94
Nonstocked	--	--	--	614	614
Total	--	--	1,241	3,348	4,589
Spruce-subalpine fir:					
Sawtimber	--	117	874	1,425	2,416
Poletimber	--	--	333	31	364
Sapling and seedling	--	91	--	655	746
Nonstocked	--	--	--	--	--
Total	--	208	1,207	2,111	3,526
White fir:					
Sawtimber	--	11	701	245	957
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	234	234
Total	--	11	701	479	1,191
Pinyon-juniper:					
Sawtimber	--	--	--	91	91
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	91	91
Nonstocked	--	--	--	--	--
Total	--	--	--	182	182
Aspen:					
Sawtimber	--	86	1,187	421	1,694
Poletimber	--	196	173	411	780
Sapling and seedling	--	--	173	293	466
Nonstocked	--	--	--	--	--
Total	--	282	1,533	1,125	2,940
Cottonwood:					
Sawtimber	--	--	--	87	87
Poletimber	--	--	94	--	94
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	94	87	181
All types:					
Sawtimber	--	214	4,161	5,811	10,186
Poletimber	--	196	784	664	1,644
Sapling and seedling	--	91	408	1,242	1,741
Nonstocked	--	--	--	1,083	1,083
Total	--	501	5,353	8,800	14,654

Table 6.--Area of commercial timberland in the Taos-Rio Arriba Working Circle by forest type, stand-size class, and site class; private owned, 1977

Forest type and stand-size class	Site class				All classes
	120+	85-119	50-84	20-49	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	--	7,432	16,682	24,114
Poletimber	--	--	--	1,849	1,849
Sapling and seedling	--	--	1,736	3,722	5,458
Nonstocked	--	--	--	1,736	1,736
Total	--	--	9,168	23,989	33,157
Ponderosa pine:					
Sawtimber	--	--	8,563	27,415	35,978
Poletimber	--	--	1,742	--	1,742
Sapling and seedling	--	--	--	1,789	1,789
Nonstocked	--	--	--	5,349	5,349
Total	--	--	10,305	34,553	44,858
Spruce-subalpine fir:					
Sawtimber	--	5,458	46,662	38,744	90,864
Poletimber	--	--	9,324	1,872	11,196
Sapling and seedling	--	1,715	--	8,615	10,330
Nonstocked	--	--	--	--	--
Total	--	7,173	55,986	49,231	112,390
White fir:					
Sawtimber	--	1,809	16,114	3,546	21,469
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	1,736	1,736
Total	--	1,809	16,114	5,282	23,205
Pinyon-juniper:					
Sawtimber	--	--	--	1,715	1,715
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	1,715	1,715
Nonstocked	--	--	--	--	--
Total	--	--	--	3,430	3,430
Aspen:					
Sawtimber	--	2,077	21,549	11,445	35,071
Poletimber	--	5,313	4,153	5,426	14,892
Sapling and seedling	--	--	4,154	3,696	7,850
Nonstocked	--	--	--	--	--
Total	--	7,390	29,856	20,567	57,813
Cottonwood:					
Sawtimber	--	--	--	2,077	2,077
Poletimber	--	--	1,788	--	1,788
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	1,788	2,077	3,865
All types:					
Sawtimber	--	9,344	100,320	101,624	211,288
Poletimber	--	5,313	17,007	9,147	31,467
Sapling and seedling	--	1,715	5,890	19,537	27,142
Nonstocked	--	--	--	8,821	8,821
Total	--	16,372	123,217	139,129	278,718

Table 7.--Area of commercial timberland in the Taos-Rio Arriba Working Circle
by forest type, stand-size class, and site class; summary--State
and private, 1977

Forest type and stand-size class	Site class				All classes
	120+	85-119	50-84	20-49	
- - - - - Acres - - - - -					
Douglas-fir:					
Sawtimber	--	--	7,774	17,584	25,358
Poletimber	--	--	--	2,071	2,071
Sapling and seedling	--	--	1,971	3,831	5,802
Nonstocked	--	--	--	1,971	1,971
Total	--	--	9,745	25,457	35,202
Ponderosa pine:					
Sawtimber	--	--	9,620	30,055	39,675
Poletimber	--	--	1,926	--	1,926
Sapling and seedling	--	--	--	1,883	1,883
Nonstocked	--	--	--	5,963	5,963
Total	--	--	11,546	37,901	49,447
Spruce-subalpine fir:					
Sawtimber	--	5,575	47,536	40,169	93,280
Poletimber	--	--	9,657	1,903	11,560
Sapling and seedling	--	1,806	--	9,270	11,076
Nonstocked	--	--	--	--	--
Total	--	7,381	57,193	51,342	115,916
White fir:					
Sawtimber	--	1,820	16,815	3,791	22,426
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	1,970	1,970
Total	--	1,820	16,815	5,761	24,396
Pinyon-juniper:					
Sawtimber	--	--	--	1,806	1,806
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	1,806	1,806
Nonstocked	--	--	--	--	--
Total	--	--	--	3,612	3,612
Aspen:					
Sawtimber	--	2,163	22,736	11,866	36,765
Poletimber	--	5,509	4,326	5,837	15,672
Sapling and seedling	--	--	4,327	3,989	8,316
Nonstocked	--	--	--	--	--
Total	--	7,672	31,389	21,692	60,753
Cottonwood:					
Sawtimber	--	--	--	2,164	2,164
Poletimber	--	--	1,882	--	1,882
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	1,882	2,164	4,046
All types:					
Sawtimber	--	9,558	104,481	107,435	221,474
Poletimber	--	5,509	17,791	9,811	33,111
Sapling and seedling	--	1,806	6,298	20,779	28,883
Nonstocked	--	--	--	9,904	9,904
Total	--	16,873	128,570	147,929	293,372

Table 8.--Area of commercial timberland in the Taos-Rio Arriba Working Circle
by stand volume and ownership classes, 1977

Stand volume per acre ¹	Ownership class		
	State	Private	State and private
----- Acres -----			
Less than 1,500 board feet	5,243	72,592	77,835
1,500 to 4,999 board feet	7,034	130,662	137,696
5,000 to 9,999 board feet	2,111	64,141	66,252
10,000 board feet or more	266	11,323	11,589
All classes	14,654	278,718	293,372

¹International 1/4-inch rule.

Table 9.--Area of commercial timberland in the Taos-Rio Arriba Working Circle
by forest type and area condition class; State and private, 1977

Forest type	Area condition class										Nonstocked	All classes
	10	20	30	40	50	60	70	80	90			
	----- Acres -----											----- Hectares -----
Douglas-fir	--	4,042	7,720	6,000	1,820	5,954	1,971	3,821	1,903	1,971	35,202	14,246
Ponderosa pine	--	--	--	2,231	4,234	5,780	17,535	1,806	11,898	5,963	49,447	20,010
Spruce-subalpine fir	3,822	5,969	13,162	21,435	1,820	24,462	27,880	15,561	1,805	--	115,916	46,910
White fir	--	--	--	3,640	3,791	7,494	7,501	--	--	1,970	24,396	9,873
Pinyon-juniper	--	--	--	--	--	--	3,612	--	--	--	3,612	1,462
Aspen	2,163	6,245	4,394	4,326	7,735	22,015	10,136	--	3,739	--	60,753	24,586
Cottonwood	--	--	--	--	--	--	4,046	--	--	--	4,046	1,637
All types	5,985	16,256	25,276	37,632	19,400	65,705	72,681	21,188	19,345	9,904	293,372	118,724

-- Hectares --

Table 10.--Area of unproductive nonreserved forest land in the Taos-Rio Arriba Working Circle by forest type and ownership class, 1977

Forest type	State		Private		State and private	
	Acres	Hectares	Acres	Hectares	Acres	Hectares
Douglas-fir	222	90	1,849	748	2,071	838
Ponderosa pine	94	38	1,789	724	1,883	762
Limber pine	271	110	3,819	1,545	4,090	1,655
Spruce-subalpine fir	335	136	9,129	3,694	9,464	3,830
Pinyon-juniper	40,498	16,389	158,665	64,210	199,163	80,599
Aspen	932	377	17,450	7,062	18,382	7,439
Cottonwood	181	73	3,865	1,564	4,046	1,637
Mixed hardwoods	22,395	9,063	97,109	39,299	119,504	48,362
All types	64,928	26,276	293,675	118,846	358,603	145,122

Table 11.--Number of growing stock trees on commercial timberland in the Taos-Rio Arriba Working Circle by species and diameter class; State and private, 1977

Species	Diameter class (inches at breast height)																All classes
	1.0- : 2.9	3.0- : 4.9	5.0- : 6.9	7.0- : 8.9	9.0- : 10.9	11.0- : 12.9	13.0- : 14.9	15.0- : 16.9	17.0- : 18.9	19.0- : 20.9	21.0- : 22.9	23.0- : 24.9	25.0- : 26.9	27.0- : 28.9	29.0- : 29.0+		
	Thousand trees																
Douglas-fir	2,098	1,696	854	863	708	445	210	86	55	19	12	7	9	7	12	7,081	
Ponderosa pine	1,106	1,957	1,272	818	551	390	213	119	78	62	30	27	8	6	5	6,642	
Limber pine	309	185	46	114	39	43	--	--	5	3	3	2	--	--	--	749	
Subalpine fir	8,564	5,007	2,055	1,239	751	407	165	95	53	19	19	7	2	3	2	18,388	
White fir	4,365	1,659	1,105	685	616	384	223	147	55	39	15	12	4	--	5	9,314	
Engelmann spruce	8,749	5,865	4,025	2,902	2,230	1,338	778	441	260	68	51	38	17	16	5	26,783	
Pinyon/juniper	246	535	119	211	28	21	21	6	9	--	--	--	--	--	--	1,196	
Total softwoods	25,437	16,904	9,476	6,832	4,923	3,028	1,610	894	515	210	130	93	40	32	29	70,153	
Aspen	11,400	10,904	4,711	3,046	1,185	691	307	176	29	4	--	--	--	--	--	32,453	
Cottonwood	54	251	38	239	80	--	--	30	23	--	3	3	--	--	--	721	
Total hardwoods	11,454	11,155	4,749	3,285	1,265	691	307	206	52	4	3	3	--	--	--	33,174	
All species	36,891	28,059	14,225	10,117	6,188	3,719	1,917	1,100	567	214	133	96	40	32	29	103,327	

Table 12.--Number of cull and salvable dead trees on commercial timberland in the Taos-Rio Arriba Working Circle by ownership class, and softwoods and hardwoods, 1977

Ownership class and species group	Cull trees		Salvable	
	Sound	Rotten	Total	dead trees
----- Thousand trees -----				
State:				
Softwoods	528	62	590	31
Hardwoods	144	214	358	26
Total	672	276	948	57
Private:				
Softwoods	10,838	1,485	12,323	881
Hardwoods	3,581	4,828	8,409	665
Total	14,419	6,313	20,732	1,546
State and private:				
Softwoods	11,366	1,547	12,913	912
Hardwoods	3,725	5,042	8,767	691
Total	15,091	6,589	21,680	1,603

Table 13.--Net volume of growing stock on commercial timberland in the Taos-Rio Arriba Working Circle by ownership class, forest type, forest type, and stand-size class, 1977

Ownership class:	Forest type	Stand-size class					All classes	
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	:		
		Thousand cubic feet					Thousand cubic meters	
State:								
	Douglas-fir	1,262	123	119	42		1,546	44
	Ponderosa pine	2,322	53	17	87		2,479	70
	Spruce-subalpine fir	3,468	382	211	--		4,061	115
	White fir	709	--	--	45		754	21
	Pinyon-juniper	23	--	14	--		37	1
	Aspen	2,427	839	98	--		3,364	95
	Cottonwood	86	77	--	--		163	5
	All types	10,297	1,474	459	174		12,404	351
Private:								
	Douglas-fir	29,112	1,025	1,857	312		32,306	915
	Ponderosa pine	23,376	506	326	642		24,850	704
	Spruce-subalpine fir	129,216	12,082	2,776	--		144,074	4,080
	White fir	21,855	--	--	334		22,189	629
	Pinyon-juniper	434	--	271	--		705	20
	Aspen	55,617	17,530	2,123	--		75,270	2,131
	Cottonwood	2,068	1,458	--	--		3,526	99
	All types	261,678	32,601	7,353	1,288		302,920	8,578
State and private:								
	Douglas-fir	30,374	1,148	1,976	354		33,852	959
	Ponderosa pine	25,698	559	343	729		27,329	774
	Spruce-subalpine fir	132,684	12,464	2,987	--		148,135	4,195
	White fir	22,564	--	--	379		22,943	650
	Pinyon-juniper	457	--	285	--		742	21
	Aspen	58,044	18,369	2,221	--		78,634	2,226
	Cottonwood	2,154	1,535	--	--		3,689	104
	All types	271,975	34,075	7,812	1,462		315,324	8,929

Table 14.--Net volume of sawtimber on commercial timberland in the Taos-Rio Arriba Working Circle by ownership class, forest type, and stand-size class, 1977

Ownership class:	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	
		Thousand board feet ¹				
State:						
	Douglas-fir	4,192	286	406	181	5,065
	Ponderosa pine	9,338	132	40	438	9,948
	Spruce-subalpine fir	12,408	621	785	--	13,814
	White fir	2,574	--	--	192	2,766
	Pinyon-juniper	106	--	68	--	174
	Aspen	8,125	1,158	282	--	9,565
	Cottonwood	451	20	--	--	471
	All types	37,194	2,217	1,581	811	41,803
Private:						
	Douglas-fir	99,419	2,372	7,109	1,339	110,239
	Ponderosa pine	96,160	1,253	776	3,214	101,403
	Spruce-subalpine fir	479,929	19,973	9,937	--	509,839
	White fir	73,486	--	--	1,422	74,908
	Pinyon-juniper	2,000	--	1,288	--	3,288
	Aspen	187,275	23,222	6,770	--	217,267
	Cottonwood	10,796	383	--	--	11,179
	All types	949,065	47,203	25,880	5,975	1,028,123
State and private:						
	Douglas-fir	103,611	2,658	7,515	1,520	115,304
	Ponderosa pine	105,498	1,385	816	3,652	111,351
	Spruce-subalpine fir	492,337	20,594	10,722	--	523,653
	White fir	76,060	--	--	1,614	77,674
	Pinyon-juniper	2,106	--	1,356	--	3,462
	Aspen	195,400	24,380	7,052	--	226,832
	Cottonwood	11,247	403	--	--	11,650
	All types	986,259	49,420	27,461	6,786	1,069,926

¹ International 1/4-inch rule.

Table 15.--Net volume of growing stock on commercial timberland in the Taos-Rio Arriba Working Circle by species and diameter class; State and private, 1977

Species	Diameter class (inches at breast height)														
	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+ All classes	Thousand cubic feet	
Douglas-fir	1,142	3,739	5,653	5,631	3,835	2,311	1,760	777	554	359	526	501	1,511	28,249	
Ponderosa pine	1,702	3,144	4,003	4,505	3,546	2,814	2,891	2,694	1,755	1,686	712	570	800	30,822	
Limber pine	36	308	266	411	--	--	142	104	109	103	--	--	--	1,479	
Subalpine fir	4,238	6,188	7,751	6,720	3,619	2,931	1,895	783	1,103	547	248	208	161	36,392	
White fir	1,378	2,393	4,294	4,605	4,042	3,639	1,892	1,615	822	781	299	--	608	26,368	
Engelmann spruce	8,023	14,607	20,527	20,204	17,380	13,829	10,702	3,901	3,219	2,843	1,469	1,626	886	119,216	
Pinyon/juniper	1	7	3	2	5	1	4	--	--	--	--	--	--	23	
Total softwoods	16,520	30,386	42,497	42,078	32,427	25,525	19,286	9,824	7,562	6,319	3,254	2,905	3,966	242,549	
Aspen	11,304	19,380	12,823	11,233	7,078	5,156	1,170	253	--	--	--	--	--	68,397	
Cottonwood	173	1,057	758	--	--	962	1,077	--	201	150	--	--	--	4,378	
Total hardwoods	11,477	20,437	13,581	11,233	7,078	6,118	2,247	253	201	150	--	--	--	72,775	
All species	27,997	50,823	56,078	53,311	39,505	31,643	21,533	10,077	7,763	6,469	3,254	2,905	3,966	315,324	

Table 16.--Net volume of sawtimber on commercial timberland in the Taos-Rio Arriba Working Circle by species and diameter class; State and private, 1977

Species	Diameter class (inches at breast height)														
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+ All classes	Thousand board feet, International 1/4-inch rule			
Douglas-fir	18,217	23,695	18,351	11,966	9,498	4,025	3,144	2,069	3,035	2,903	8,822	105,725			
Ponderosa pine	13,644	20,438	18,017	15,352	16,781	15,466	9,328	9,213	4,316	3,623	4,882	131,060			
Limber pine	914	1,657	--	--	715	533	574	568	--	--	--	4,961			
Subalpine fir	29,657	33,039	18,529	15,100	9,736	4,020	5,694	2,855	1,307	1,112	876	121,925			
White fir	15,138	20,372	18,476	16,499	8,242	6,807	3,318	3,079	1,169	--	2,432	95,532			
Engelmann spruce	73,613	99,250	89,326	71,784	55,416	20,136	16,644	14,804	7,702	8,614	4,740	462,029			
Pinyon/juniper	8	6	15	4	10	--	--	--	--	--	--	43			
Total softwoods	151,191	198,457	162,714	130,705	100,398	50,987	38,702	32,588	17,529	16,252	21,752	921,275			
Aspen	0	59,101	39,476	28,992	6,503	1,387	--	--	--	--	--	135,459			
Cottonwood	0	--	--	5,400	5,938	--	1,070	784	--	--	--	13,192			
Total hardwoods	0	59,101	39,476	34,392	12,441	1,387	1,070	784	--	--	--	148,651			
All species	151,191	257,558	202,190	165,097	112,839	52,374	39,772	33,372	17,529	16,252	21,752	1,069,926			

Table 18.--Net volume of timber on commercial timberland in the Taos-Rio Arriba Working Circle by class of timber, and softwoods and hardwoods; State and private, 1977

Class of timber	Softwoods	Hardwoods	All classes
----- Thousand cubic feet -----			
Sawtimber trees:			
Saw-log portion	182,799	25,962	208,761
Upper-stem portion	12,844	1,318	14,162
Total	195,643	27,280	222,923
Poletimber trees	46,906	45,495	92,401
All growing stock trees	242,549	72,775	315,324
Sound cull trees	8,259	1,196	9,455
Rotten cull trees	5,973	8,422	14,395
Salvable dead trees	7,483	3,967	11,450
All timber	264,264	86,360	350,624

Table 19.--Net volume of growing stock on commercial timberland in the Taos-Rio Arriba Working Circle by forest type and species; State and private, 1977

Forest type	Species										All species
	Douglas-fir:	Ponderosa:	Limber:	Subalpine:	White fir:	Engelmann:	Pinyon/:	Total:	Aspen:	Cottonwood:	
	pine:	pine:	pine:	fir:	fir:	spruce:	juniper:	softwoods:	hardwoods:	hardwoods:	

Table 20.--Net volume of sawtimber on commercial timberland in the Taos-Rio Arriba Working Circle
by forest type and species; State and private, 1977

Forest type	Species									
	Douglas-fir:	Ponderosa:	Limber:	Subalpine:	White fir:	Engelmann:	Pinyon/:	Total:	Cottonwood:	All species
	pine	pine	pine	fir	fir	spruce	juniper	softwoods	hardwoods	
Thousand board feet, International 1/4-inch rule										
Douglas-fir	69,378	14,688	1,553	850	23,516	2,540	2	112,527	2,777	115,304
Ponderosa pine	3,284	106,333	--	--	1,710	--	24	111,351	--	111,351
Spruce-										
subalpine fir	14,694	--	1,733	89,366	2,503	408,030	--	516,326	6,732	523,653
White fir	8,474	4,078	1,107	1,563	51,509	--	--	66,731	10,943	77,674
Pinyon-juniper	--	3,445	--	--	--	17	17	3,462	--	3,462
Aspen	9,895	2,516	568	30,146	16,294	51,056	--	110,475	115,007	226,832
Cottonwood	--	--	--	--	--	403	--	403	11,247	11,650
All types	105,725	131,060	4,961	121,925	95,532	462,029	43	921,275	135,459	1,069,926

Table 21.--Net annual growth of growing stock and sawtimber on commercial timberland
in the Taos-Rio Arriba Working Circle by ownership class and species, 1977

Ownership class:	Species									
	Douglas-fir:	Ponderosa:	Limber:	Subalpine:	White fir:	Engelmann:	Total:	Cottonwood:	Total:	All species
	pine	pine	pine	fir	fir	spruce	softwoods	Aspen	hardwoods	
GROWING STOCK										
Cubic feet										
State	29,869	74,669	1,290	30,441	32,540	92,715	261,524	75,714	5,952	343,190
Private	541,217	758,117	21,714	898,086	661,135	3,703,145	6,583,414	1,860,804	123,808	8,568,026
Total	571,086	832,786	23,004	928,527	693,675	3,795,860	6,844,938	1,936,518	129,760	8,911,216
GROWING STOCK										
Cubic meters										
State	846	2,114	36	862	922	2,625	7,405	2,144	169	9,718
Private	15,325	21,468	615	25,431	18,721	104,862	186,422	52,692	3,506	242,620
Total	16,171	23,582	651	26,293	19,643	107,487	193,827	54,836	3,675	252,338
SAWTIMBER										
Board feet, International 1/4-inch rule										
State	159,268	365,370	2,884	106,997	109,308	460,621	1,204,448	327,836	7,613	1,539,897
Private	3,353,572	3,448,693	74,606	3,577,293	2,418,808	17,215,241	30,088,213	7,690,790	180,040	37,959,043
Total	3,512,840	3,814,063	77,490	3,684,290	2,528,116	17,675,862	31,292,661	8,018,626	187,653	39,498,940

Table 22.--Annual mortality of growing stock and sawtimber on commercial timberland in the Taos-Rio Arriba Working Circle by ownership class, and softwoods and hardwoods, 1977

Species group and ownership class	:		:	
	- Cubic feet -	Growing stock	- Cubic meters -	Sawtimber - Board feet ¹ -
Softwoods:				
State	11,666	330		40,037
Private	411,674	11,658		1,376,816
Total	423,340	11,988		1,416,853
Hardwoods:				
State	9,728	276		14,894
Private	258,837	7,329		501,715
Total	268,565	7,605		516,609

¹International 1/4-inch rule.

Table 23.--Annual mortality of growing stock and sawtimber on commercial timberland in the Taos-Rio Arriba Working Circle by cause of death and species; State and private, 1977

Cause of death	Species						All species
	Douglas-fir	Subalpine fir	White fir	Engelmann spruce	Total softwoods	Aspen	
GROWING STOCK							
- - - - - Cubic feet - - - - -							
Insects	--	28,287	22,764	58,309	109,360	59,520	168,880
Disease	--	--	56,043	--	56,043	49,954	105,997
Fire	--	--	--	--	--	--	--
Animal	--	--	--	--	--	--	--
Weather	--	--	--	--	--	--	--
Suppression	--	--	--	--	--	--	--
Unknown	20,817	82,300	127,446	--	230,563	95,019	325,582
Logging	--	--	27,374	--	27,374	64,072	91,446
Total	20,817	110,587	233,627	58,309	423,340	268,565	691,905
GROWING STOCK							
- - - - - Cubic meters - - - - -							
Insects	--	801	645	1,651	3,097	1,685	4,782
Disease	--	--	1,587	--	1,587	1,415	3,002
Fire	--	--	--	--	--	--	--
Animal	--	--	--	--	--	--	--
Weather	--	--	--	--	--	--	--
Suppression	--	--	--	--	--	--	--
Unknown	589	2,331	3,609	--	6,529	2,691	9,220
Logging	--	--	775	--	775	1,814	2,589
Total	589	3,132	6,616	1,651	11,988	7,605	19,593
SAWTIMBER							
- - - - - Board feet, International 1/4-inch rule - - - - -							
Insects	--	137,324	95,837	274,236	507,397	--	507,397
Disease	--	--	196,689	--	196,689	--	196,689
Fire	--	--	--	--	--	--	--
Animal	--	--	--	--	--	--	--
Weather	--	--	--	--	--	--	--
Suppression	--	--	--	--	--	--	--
Unknown	--	191,678	404,861	--	596,539	516,609	1,113,148
Logging	--	--	116,228	--	116,228	--	116,228
Total	--	329,002	813,615	274,236	1,416,853	516,609	1,933,462

Barrett, Michael K., and Dorothy G. Felt.

1980. Forest area and timber resource statistics for the Taos-Rio Arriba Working Circle, New Mexico, 1977. USDA Forest Serv. Resour. Bull. INT-21, 24 p. Intermt. For. and Range Exp. Stn., Ogden, Utah 84401.

This bulletin presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Resources Evaluation standards.

KEYWORDS: Forest surveys (regional), forest area classification, stand volume.

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The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station includes the States of Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

Field programs and research work units of the Station are maintained in:

Boise, Idaho

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