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Forests in Wyoming

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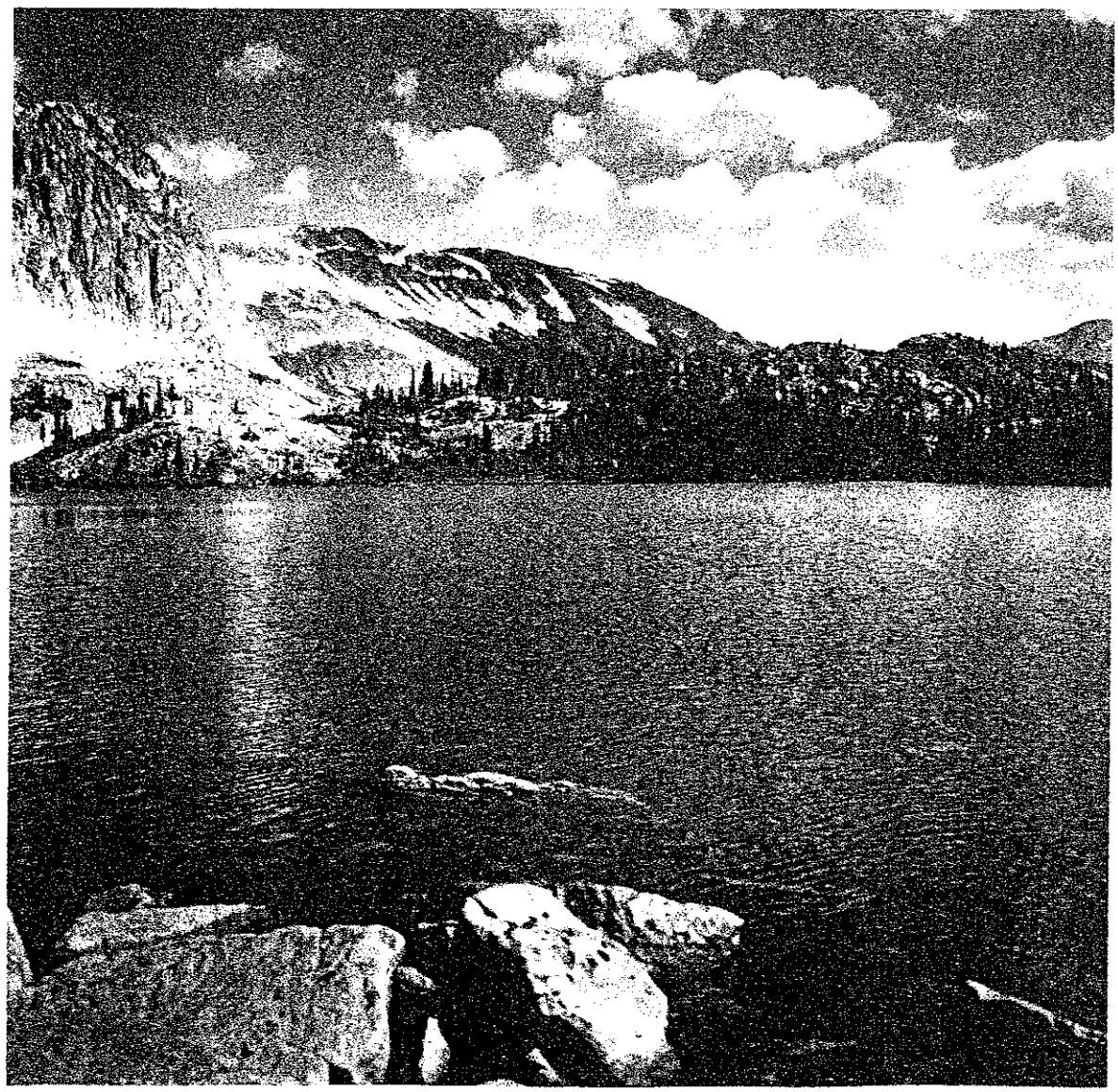

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ACKNOWLEDGMENTS

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PREFACE

Forest Survey is a continuing nationwide undertaking conducted by the Forest Service, U.S. Department of Agriculture, with the primary objective of providing an assessment of the renewable resources on the Nation's forests. This requires periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The Intermountain Research Station with headquarters in Ogden, UT, administers the forest resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming. 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 mortality. These data, when combined with similar information for Federal lands, provide a basis for forest policies and programs and for the orderly development and use of the resources.

RESEARCH SUMMARY

Wyoming has about 9.8 million acres of forest land, 9.1 million of it timberland. Over three-fourths is on public land, principally in Yellowstone and Grand Teton National Parks and seven National Forests. More than 3 million acres of forest in the parks and designated wilderness areas are reserved from timber harvesting.

The volume of wood on the 6.7 million acres of unreserved timberland is about 8.4 billion cubic feet. The dominant species is lodgepole pine. Mortality has been heavy, primarily due to insect and disease activity; however, in 1983 the volume of inventory was increasing by about 51 million cubic feet annually.

This report highlights additonal information on the extent, nature, condition, and use of Wyoming's forests.

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HIGHLIGHTS

Area

- The land area of Wyoming is about 62.1 million acres; 9.8 million acres—15.8 percent— are forest.
- Roughly 9.1 million acres are timberland, over half are in the seven National Forests.
- Lodgepole pine is the dominant species. As a forest type, its 3.6 million acres makes up 39 percent of the timberland. Most of the remainder is made up of the spruce-fir and ponderosa pine types.
- Three-fifths of the timberland is classified as sawtimber stands and about one-fifth is poletimber stands. Approximately 425,000 acres are nonstocked.
- Woodland forests cover 781,000 acres, nearly all of which is made up of juniper species.

Volume

- There are over 8.4 billion cubic feet of wood in growing-stock trees 5 inches diameter at breast height (d.b.h) and larger; sawtimber volume is nearly 28.7 billion board feet (Scribner rule).
- About 75 percent of the softwood volume is in the National Forests.
- Approximately 2.8 billion cubic feet of the softwood growing-stock volume is lodgepole pine; spruce add another 1.6 billion, and ponderosa pine and the true firs each contribute 1.1 billion cubic feet.
- Trees in Wyoming's timberlands tend to be small. For example, a third of lodgepole pine growing-stock volume is in trees less than 9.0 inches d.b.h.

Growth

- Wyoming's timberlands have the inherent potential to produce about 36 cubic feet of wood per acre per year. About 20 percent can produce 50 or more cubic feet per acre per year. Thin soils and short growing seasons are the principal reasons for low potential in the other 80 percent.
- Total net growth in 1983 was about 86 million cubic feet, or an average of 15.5 cubic feet per acre, something less than half the potential.

Mortality

- In 1983 mortality was about 85 million cubic feet, about half the total gross growth and nearly equal to the net growth.
- Lodgepole pine was the hardest hit, accounting for 44 percent of all the mortality; insects and diseases were the major causes.

Removals

- Timber harvest in Wyoming was about 30 million cubic feet in 1983, mostly sawlogs.
- Nearly two-thirds of the harvest came from the National Forests. Almost 90 percent of the harvest was ponderosa pine and lodgepole pine.
- An estimated 143,000 cords—10.4 million cubic feet—of fuelwood were harvested from Wyoming's forests in 1983.
- Most of the fuelwood harvest was dead lodgepole pine from the National Forests.

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INTRODUCTION

The second survey of Wyoming's forest land was completed in 1983. Unlike the first survey done between 1957 and 1960 (Choate 1963), the woodland forests (primarily the juniper lands) were included. Because of changes in definitions, standards, and sampling design and intensity, direct comparisons between data from the two inventories cannot be made, except in general terms.

Included in this report are basic statistics on forest area, wood volume, growth, mortality, removals, and the kind, extent, and significance of forest resource uses, as well as some thoughts about the future.

THE SETTING

Wyoming's 98,000 square miles lie between 41 and 45 degrees north latitude and 104 and 111 degrees west longitude, putting the State about halfway between the Equator and the North Pole, and squarely in the Mountain Time Zone. These locational descriptors are only indirectly related to the location and nature of the State's forests.

Wyoming averages over 6,000 feet in elevation. From the highest point, 13,804-foot Gannett Peak in the Wind River Range, the elevation drops to just over 3,000 feet in the northeastern corner of the State. The primary mountain ranges—those reaching 10,000 feet elevation or more—are the Bighorn, in north-central Wyoming; the Absaroka, Teton, Gros Ventre (Grow-Vont), and Wind River Ranges cutting across the northwestern and west-central portions; and the Medicine Bow and Laramie Ranges in the southeast.

Wyoming is part of a large geographic area in the western United States that has a dry climate. Scientifically it is a "steppe" region (Bailey 1976). It is semiarid; not as dry as the deserts of the Southwest but drier than more humid regions that surround it. Within the steppe region there are lowlands and highlands, and some localized areas where climate, soils, and topography combine to create an environment that produces patches or stringers of vegetation unlike that immediately adjacent.

The total area of Wyoming is about 62.6 million acres, 62.1 million of which is land (table 1). In 1984 some 33.8 million acres (54 percent) were publicly owned. Detailed data on status and ownership are given in appendix III.

WHERE THERE ARE FORESTS—AND WHY

Elevation, land form, and climate affect vegetation distribution.

Wyoming overlays three major ecological zones distinctive for their environment, largely due to elevation, landform, and climate, each with its characteristic vegetation (Bailey 1976) (fig. 1).

The native vegetation of roughly the eastern third of the State is not hay or improved pasture as it may appear today. Pioneers coming into the territory traveled across the rolling prairies and low-elevation tablelands of moderate relief, broken by occasional valleys. The winters were cold and dry, the summers hot. They still are. The vegetation was mainly short grasses, bunched and sparsely distributed, with scattered trees and shrubs where there was more moisture. That portion of the Black Hills extending into northeastern Wyoming (the Bear Lodge Range) had then, as it does now, stands of ponderosa pine (*Pinus ponderosa)* at higher elevations.

Table 1--Total land and water area by ownership class, Wyoming, 1984

Ownership class	Area
	- - Acres - -
Land:	
Public:	
National Forest	9,254,365
Other public:	
Bureau of Land Management	17,841,151
National Parks[1]	2,251,119
Miscellaneous Federal	188,282
State	4,221,412
County and municipal	2,717
Total other public	24,504,681
Total public	33,759,046
Private:	
Indian	1,886,703
Other private	26,427,211
Total private	28,313,914
Total land area	62,072,960
Census water	525,030
Total land and water[2]	62,597,990

[1]Not included with miscellaneous Federal, a component of other public, for purpose of clarity. These lands are reserved and are included in tables 1, 2, 12, and 71 only.

[2]U.S. Department of Commerce, Bureau of Census. Area measurement reports, GE-20 No. 1, 22 p., 1970, updated to account for changes in inland water estimates obtained from the USDA, Soil Conservation Service's National Resource Inventory, 1982.

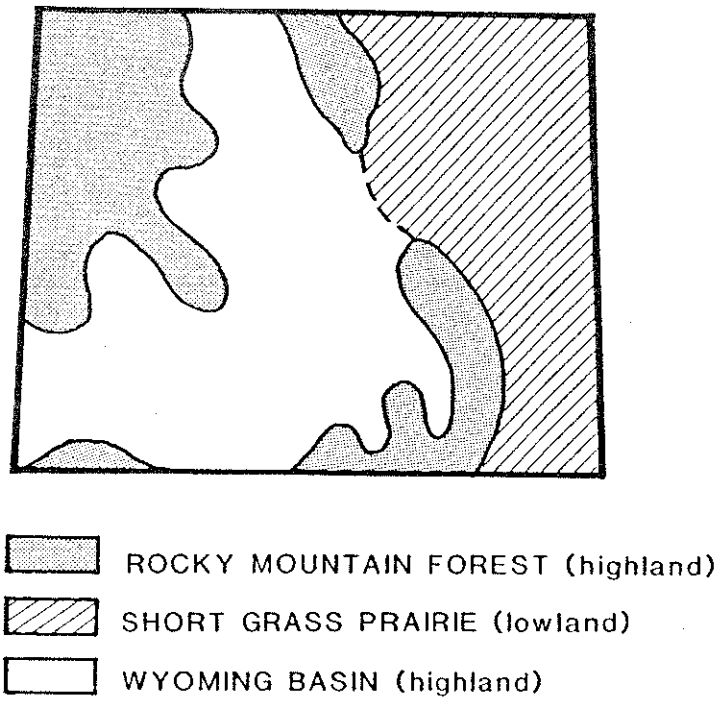


Figure 1—Provinces in the highland and lowland ecoregions of Wyoming (after Bailey 1976).

Nearly half the State is taken up by an area of high-altitude plains (6,000 to 8,000 feet) called the Wyoming Basin. A tactfully understated description of the climate in the Basin is it has cold winters. The town of Big Piney, for example, merely advertises itself as the "Ice-box of the Nation," accepting its plight and ignoring the more colorful expletives frequently used to describe winters in the area. The principal vegetation in the Basin is sagebrush coupled with wheatgrasses and some of the short grasses.

Timberland forests are mostly in the mountains.

In Wyoming, as in other Rocky Mountain States, where there are mountains there are forests. That is where most of the moisture is. The distribution of vegetational zones is largely a function of latitude, elevation, slope exposure, and prevailing wind direction. Generally speaking, similar vegetation zones occur at higher elevations in the south than in the north because of moisture and temperature regimens.

The coincidence of forest land and mountains is fairly evident if you compare the forest type map (fig. 2) with the landform indicated in figure 1. The major exception to the general rule of mountains and forests is in the northeast part of the State where ponderosa pine finds a suitable environment in the higher elevations of the plains and foothills of the Black Hills. Some of the broken terrain in the Wyoming Basin and the western foothills of the Bighorn Mountains is occupied by somewhat sparse woodland forests whose major component is juniper (*Juniperus* sp.).

The vegetational zones in the mountains are usually highly visible and somewhat predictable. Moving from the warm-dry environment of the lower slopes to the cool-moist environment at higher elevations, the various species find their niche in the ecological scheme of things.

A stylized progression from lower to upper timberline would be ponderosa pine, Douglas-fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*), and going on up to timberline, Engelmann spruce (*Picea engelmannii*), and subalpine fir (*Abies lasiocarpa*). However, Douglas-fir and ponderosa pine often swap relative position depending on moisture and temperature conditions. But the forest landscapes can vary greatly depending on the compensating environmental factors already mentioned, and may include desert shrubs at the bottom, one or more of the coniferous forest zones in the middle, and bare rock at the top.

NATURE OF THE FORESTS

Most of the forest is timberland.

Two kinds of forest land have been alluded to—timberland and woodland. Timberlands are occupied by tree species that traditionally have been used for industrial roundwood products such as sawlogs, pulpwood, poles, and railroad ties. There are about 9 million acres of such land in Wyoming (table 2). The 781,000 acres of woodlands, on the other hand, are made up of tree species whose use, because of form and stature, has generally been limited to cutting for fenceposts and fuelwood.

Timberlands and woodlands are further classified by forest type, a descriptor based on the predominant tree species present in the stand. In Wyoming there are nine major tree species—seven conifers and two hardwoods—that make up five generalized forest types for purposes of this report (fig. 2). A list of the major forest tree species is included in appendix IV.

In the brief descriptions that follow, several "liberties" have been taken with conventional type classification for the sake of convenience and clarity.

Table 2--Total land area by major land class and ownership class, Wyoming, 1984

Land class	Ownership class			
	National Forest	Other public	Private	Total
	- - - - - - - - - Thousand acres - - - - - - - - -			
Timberland:				
Reserved	1,292.1	1,751.5	87.5	3,131.1
Nonreserved	3,544.5	805.9	1,584.7	5,935.1
Total	4,836.6	2,557.4	1,672.2	9,066.2
Woodland:				
Reserved	--	3.4	0.3	3.7
Nonreserved	1.2	475.2	301.3	777.7
Total	1.2	478.6	301.6	781.4
Total forest land:				
Reserved	1,292.1	1,754.9	87.8	3,134.8
Nonreserved	3,545.7	1,281.1	1,886.0	6,712.8
Total	4,837.8	3,036.0	1,973.8	9,847.6
Nonforest land	4,416.6	21,468.7	26,340.1	52,225.4
Total land area[1]	9,254.4	24,504.7	28,313.9	62,073.0

[1]On this and all following tables, totals may vary due to rounding.

Timberland Forest Types

Lodgepole pine: the dominant tree species.

Lodgepole Pine—Lodgepole pine covers more acres than any other forest type in the State. The majority of the lodgepole type is publicly owned. It grows between roughly 6,000 and 10,500 feet in elevation in the mountains of northern Wyoming and between 7,000 and 11,500 feet in the Laramie and Medicine Bow Ranges to the south. Often a pioneer species in burn areas, lodgepole tends to form pure, dense, "dog-hair" stands of trees with small diameters and slow rates of growth (fig. 3). At upper elevations, it is a minor component in the spruce-fir type and mixes with Douglas-fir and ponderosa pine types at lower elevations. Lodgepole pine is one of Wyoming's most important timber species and accounts for a large portion of the harvest, even though over half the forest type is reserved:

Ownership class	Land class		Total
	Nonreserved	Reserved	
	Thousand acres		
National Forest	1,480.3	366.9	1,847.2
Other public	109.6	1,464.2	1,573.8
Private	121.8	11.3	133.1
All owners	1,711.7	1,842.4	3,554.1

Figure 3—Lodgepole pine in the Big Horn Mountains.

Ponderosa pine is mostly in the east.

Ponderosa Pine—The ponderosa pine type occurs almost exclusively in the eastern half of the State. Most of it is found in the Black Hills Region from about 4,000 to 8,500 feet in elevation. At its lower limit ponderosa occupies the transition zone from timberland to woodland or grassland (fig. 4). Here, the open parklike stands, with Rocky Mountain juniper (*Juniperus scopulorum*), bur oak (*Quercus macrocarpa*), and green ash (*Fraxinus pennsylvanica*) in the understory, provide important cover and forage for wildlife and grazing for domestic livestock. About 64 percent of the ponderosa pine type is privately owned:

Ownership class	Land class		Total
	Nonreserved	Reserved	
	Thousand acres		
National Forest	254.5	—	254.5
Other public	249.0	1.3	250.3
Private	905.1	—	905.1
All owners	1,408.6	1.3	1,409.9

Figure 4—Ponderosa pine on the lower slopes.

Most of the Douglas-fir grows in the National Forests.

Douglas-fir—The elevational range of Douglas-fir in Wyoming is nearly identical to ponderosa pine. In fact, the two species are often found in mixed stands, although Douglas-fir occasionally grows in pure stands on cooler and wetter sites. On good sites, it maintains a high rate of height growth and is considered an important, though minor, contributor to Wyoming's timber industry. Most of the 736,000 acres is in the National Forests:

Ownership class	Land class		Total
	Nonreserved	Reserved	
	Thousand acres		
National Forest	487.6	106.7	594.3
Other public	66.4	—	66.4
Private	75.4	—	75.4
All owners	629.4	106.7	736.1

Spruce-fir type is in the high country.

Spruce-Fir—This type, which includes limber pine and several other minor timber species, accounts for the majority of Wyoming's high-elevation forests. Usually occurring from 9,000 feet up to timberline (11,000 feet), the spruce-fir type occupies some of the coldest and wettest sites in the Rocky Mountains (fig. 5). Engelmann spruce is generally the dominant species in the stands, with subalpine fir and blue spruce (*Picea pungens*) accounting for much of the remaining stocking. Found throughout nearly all of Wyoming's high mountain ranges, the spruce-fir and spruce types are considered more important for recreation, wildlife, and watershed protection than as a source of timber. Roughly 40 percent of the type is reserved from commercial timber use:

Ownership class	Land class		Total
	Nonreserved	Reserved	
	Thousand acres		
National Forest	1,142.8	797.7	1,940.5
Other public	321.2	278.5	599.7
Private	248.5	75.5	324.0
All owners	1,712.5	1,151.7	2,864.2

Hardwoods—This is a "convenience" category combining the two major deciduous timber types, aspen and cottonwood. Together they occupy slightly less than half a million acres.

Hardwoods are important for wildlife.

Aspen (*Populus tremuloides*), a pioneer species on burned and other disturbed areas, is usually found in scattered small stands and is eventually replaced by coniferous species, particularly spruce and fir. Although aspen is not important commercially, it does provide valuable wildlife habitat and watershed protection.

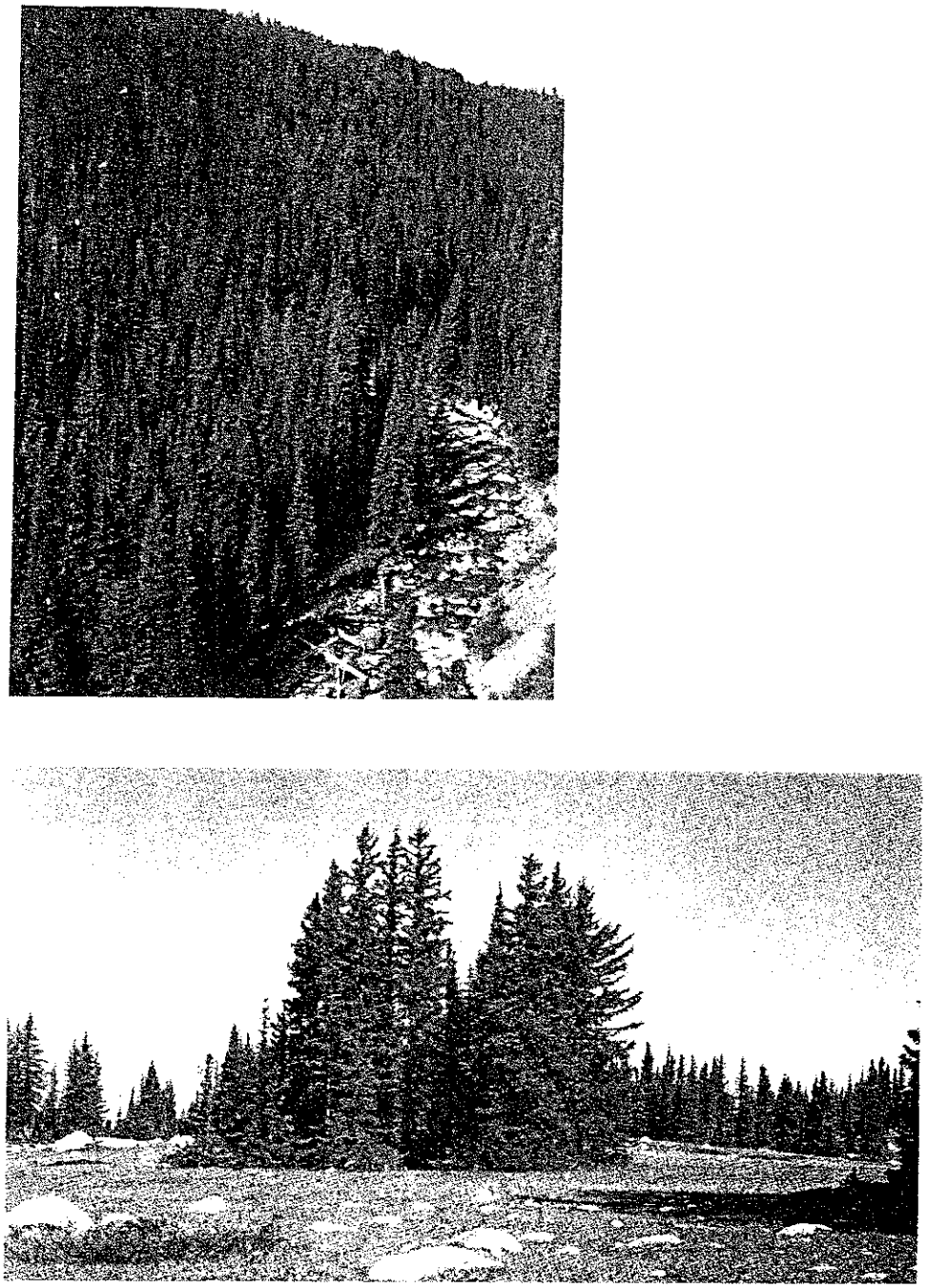


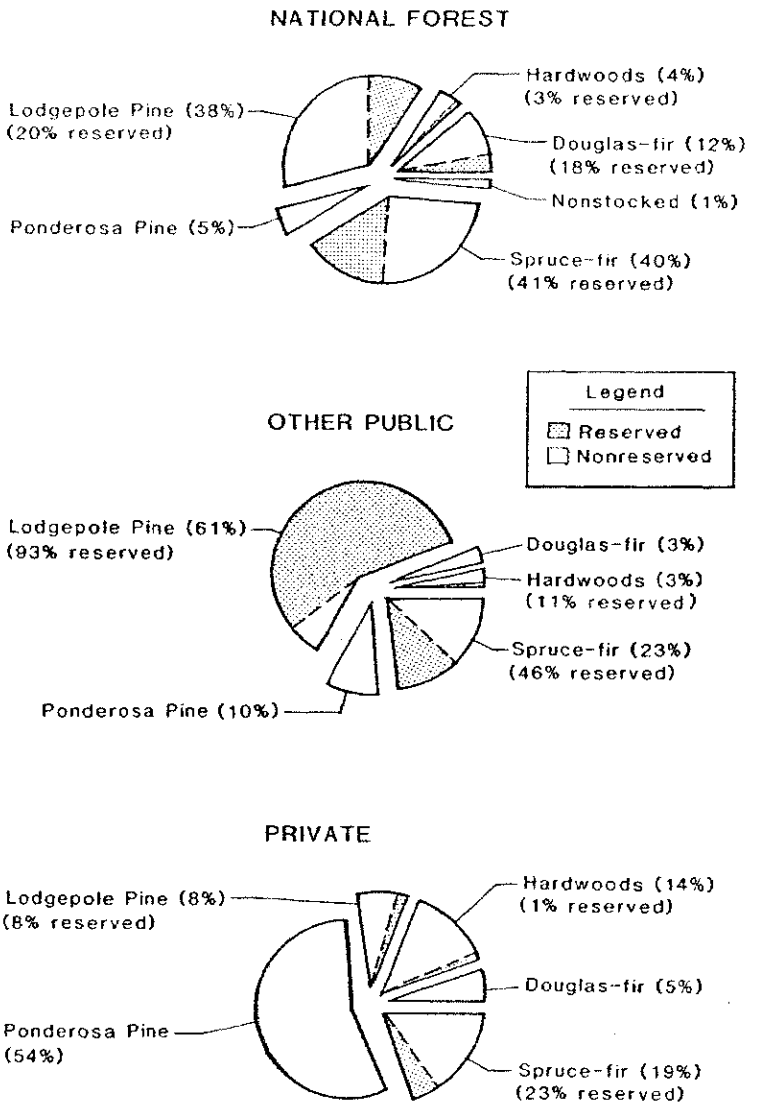
Figure 5—The spruce-fir type can be dense (A) or parklike near timberline (B).

Cottonwood is the major hardwood species of the riparian areas along the major rivers and streams. Narrowleaf cottonwood (*P. angustifolia*), generally found in the western portion of the State, and plains cottonwood (*P. deltoides* var. *occidentalis*) in the east, mix with spruce, juniper, willow (*Salix* sp.), bur oak, boxelder (*Acer negundo*), and other species to form unique vegetative zones along streams, lake margins, and other wet areas.

Some use is made of cottonwood for fuelwood, but its role in providing cover for wildlife and shade for streams is considered by many to be of much greater value. Hardwoods occur nearly equally on public and private land:

Ownership class	Land class		Total
	Nonreserved	Reserved	
	Thousand acres		
National Forest	179.3	6.5	185.8
Other public	59.7	7.6	67.3
Private	233.9	0.8	234.7
All owners	472.9	14.9	487.8

Figure 6 presents a summary of the distribution of timberland by forest type and ownership class.



Woodland Forest Types

Pinyon-Juniper and Juniper—In terms of area, pinyon-juniper (P-J) and juniper are the major woodland forest types in Wyoming occupying some 709,000 acres (fig. 7). They generally occur below 6,000 feet in elevation on very dry, sandy or rocky soils, and endure seasonal temperatures ranging from below zero to in excess of 100 °F. The pure juniper type dominates, with Rocky Mountain juniper and Utah juniper (*Juniperus osteosperma*) forming mixed stands where their ranges overlap. About 13,000 acres of the P-J type occur in the southwestern portion of the State. Here, common pinyon (*Pinus edulis*) accounts for a major portion of the stocking. Juniper species are generally small in diameter, less than 20 feet tall, multiple stemmed, and slow growing. Although of some value commercially for fuelwood, the woodland areas are more important as grazing resources for livestock and habitat for wildlife. Few of the woodlands are in the National Forests:

Ownership class	Land class		Total
	Nonreserved	Reserved	
	Thousand acres		
National Forest	1.2	—	1.2
Other public	455.0	3.4	458.4
Private	249.1	0.3	249.4
All owners	705.3	3.7	709.0

Oak—The oak forest type occurs almost exclusively in the Black Hills region of Wyoming where the range of many predominantly eastern species reach their farthest point west. Bur oak is the dominant species and grows in pure stands or mixes with tree species such as ponderosa pine, green ash, and boxelder. There are about 28,000 acres of this type, and nearly all of it is privately owned.

Figure 7—Juniper dominates the woodlands.

Much of the woodland hardwoods lie in riparian zones.

Other Woodland Types—This group includes any minor woodland forest types that occur in the State. Specifically for Wyoming, the riparian, mountain brush, and other woodland types are combined under this general heading. Riparian and mountain brush occupy about 38,000 acres and are perhaps better descriptors of vegetative conditions than forest types. These areas generally support mixed stands of a wide variety of hardwood tree species. Riparian sites are often dominated by willow, alder (*Alnus* sp.), birch (*Betula* sp.), or other woodland species, but timber species such as cottonwood or spruce are usually present. The riparian area in Wyoming totals just over 24,000 acres. The nearly 14,000 acres of the mountain brush type are typified by stands of mountain-mahogany (*Cercocarpus ledifolius*), either alone or mixed with other upland hardwoods or junipers. The classification "other hardwoods" is basically a "catch-all." This 7,000-acre forest "type" is found on sites where woodland tree species, other than those previously mentioned, make up the plurality of stocking. Common chokecherry (*Prunus virginiana*), hawthorn (*Crataegus* sp.), dogwood (*Cornus* sp.), and Rocky Mountain maple (*Acer glabrum*) are examples of the species expected to be found here.

RESOURCES IN DISGUISE

The forest: an environment of interacting resources.

Many people tend to see Wyoming's forests only as a main ingredient of the varied scenery for which the State is famous. The trees give texture, color, and some perspective to the enormity of the uplifted rock masses forming the major mountain ranges. But the forest environment is a collection of interacting resources masquerading as scenic landscapes that are, in themselves, an economic resource (fig. 8).

These resources provide many values, not only to Wyoming but to the rest of the Nation as well. As in other Western States, water is at a premium and is one of the more valuable resources from the forest land. The forest also provides forage and browse for livestock and big

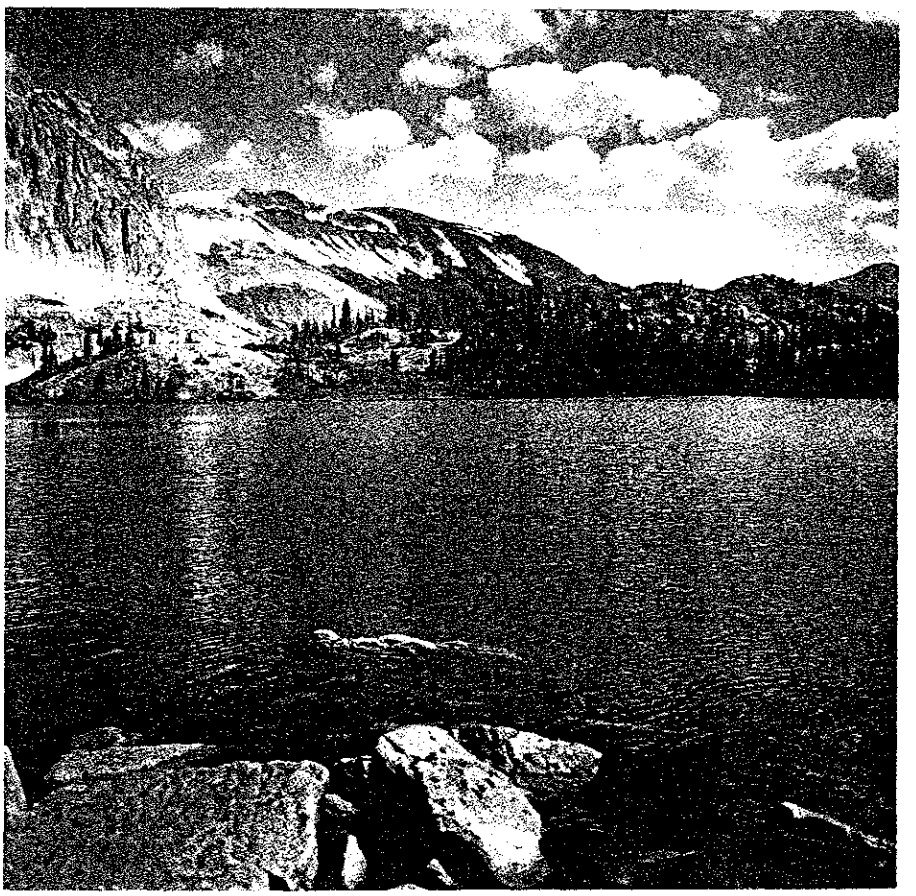


Figure 8—Tranquility at the foot of the Snowy Range.

game animals, and most acres provide needed habitat for other species of wildlife. Obviously, trees are a source of timber for both commercial use and fuel. And almost all the forest and much of the nonforest land provides recreation opportunities in one form or another. Finally, there are vast mineral resources hidden beneath the surface, and many forested areas could be impacted by future energy development activities.

Water

Wyoming's water is at a premium...

The value of water in a dry State such as Wyoming is so obvious it hardly need be mentioned. Much of it originates in the forested mountains, a large part of it as winter snows. And as the snowpack goes, so go the major streamflows for the rest of the year. During a year of average precipitation, an estimated 17.3 million acre feet of surface water is available for use in the State (State of Wyoming 1985). That is about 5.6 trillion gallons.

The water originating in or flowing through Wyoming serves four major river basin drainages, all of which eventually reach salt water (fig. 9). Water east of the Continental Divide flows north and east, eventually reaching the Missouri River by the time it gets to the south suburbs of Omaha and then on to the Gulf of Mexico via the Mississippi. That amounts to about 9.9 million acre feet of water from 45 million acres of land, except for small amounts in the Laramie and North Platte Rivers, both of which have their headwaters in Colorado. Another minor exception is the precipitation of some unknown small amounts in the Great Divide Basin. Whatever rain or snow falls in that rather curious depression of about 5,000 square miles, rimmed by the split in the Continental Divide, stays there.

The Green River flows south out of the Wind River Mountains collecting enough from 13.4 million acres to deliver some 2.3 million acre feet into Utah and out to the Colorado River system that eventually finds the Baja and Gulf of California.

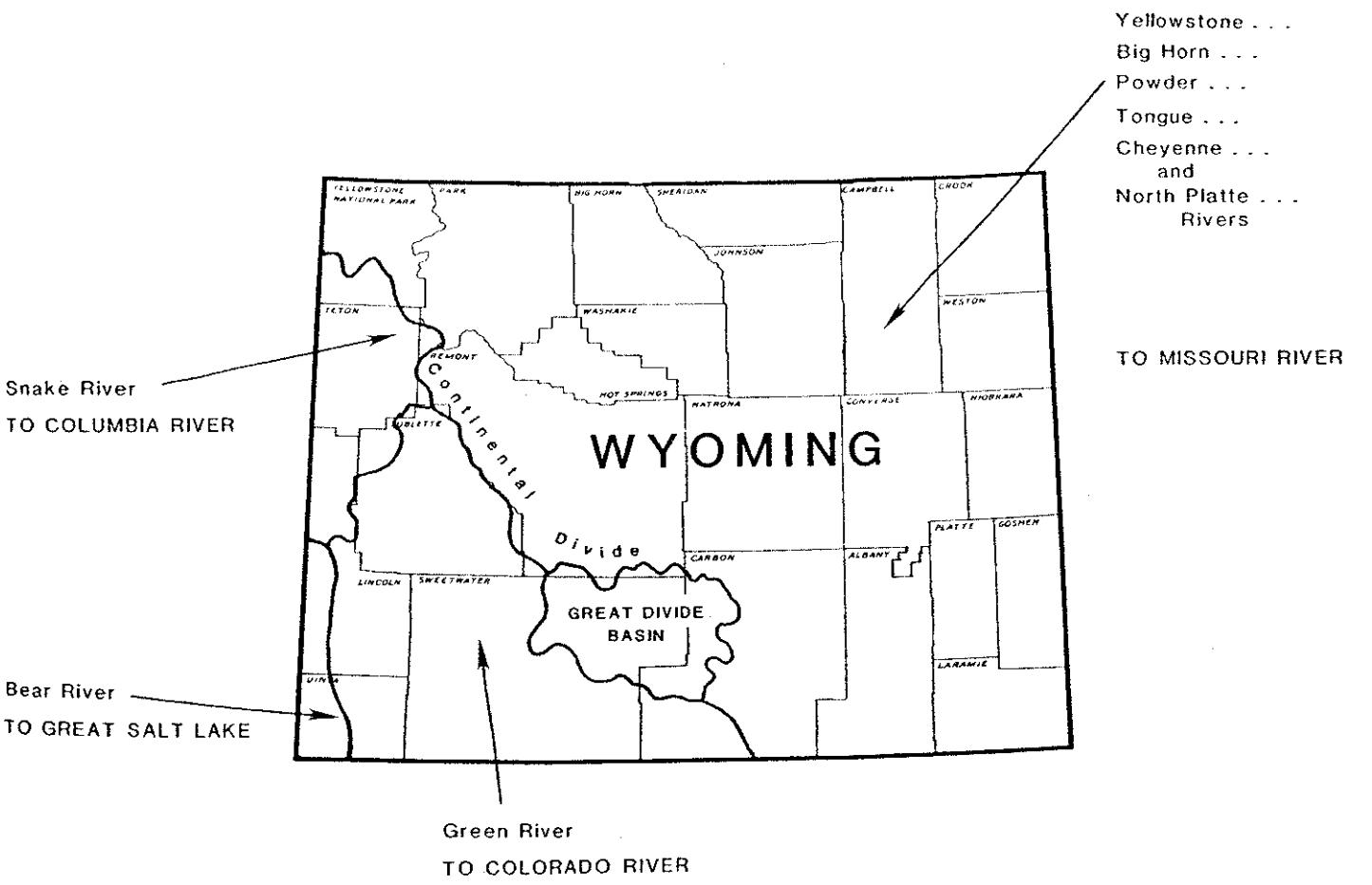


Figure 9—Major river drainages in Wyoming.

Near the Idaho border the Salt and Greys Rivers feed the Snake, a major tributary of the Columbia River, going to the Pacific Ocean. Roughly 31 percent of the stream outflow from Wyoming is accounted for by the 4.4 million acres in the Snake River drainage.

The Bear River, originating in Utah, winds in and out of Wyoming near the Utah border and ends up in the Great Salt Lake, the largest depository in the Great Basin drainage. The 1 million acres served by the Bear River delivers about 400,000 acre feet of water to Utah.

but much of it is used out of State.

Of the 17.3 million acre feet of water available, 14.4 million is actually out-flow from the State for use downstream. In 1985, about 2.3 million acre feet were put back into the ground for irrigation of agricultural crops and about 200,000 acre feet were consumed for municipal and industrial use. Interestingly, more than twice that amount evaporates from the streams and reservoirs. The relatively small amount of consumptive water use is not surprising considering the low population of the State—only about 470,000 in 1980 (State of Wyoming 1986c).

Perhaps the major value of Wyoming's water resources lies in the wildlife and fisheries it sustains and the interrelationship with recreational opportunities. People like to play in it—a lot. And they spend a lot of money year around for the opportunity.

Wildlife and Recreation

Wildlife and recreation go together.

The many species of game and nongame animals, birds, and fish making up Wyoming's diverse wildlife population take up residence in the forests, open rangelands, and streams that provide the habitat best suited for their survival. And the values of the wildlife are, of course, founded in people, whose attraction to the animals runs more toward big, unusual, and rare, than commonplace.

People like to see the big or unusual.

Big game animals seem to get the most attention, and they abound in Wyoming's wildlands. It may not be every hiker's or camper's dream to have a face-to-face encounter with a bear or moose, but certainly the prospect of sighting one or some other "you don't see those everyday" species is part of the lure of the forest. On the other hand, most hunters assuredly hope for a confrontation, albeit in a situation clearly to their own advantage.

How many big game animals are there in Wyoming? No one knows for sure. Populations fluctuate from year to year and tend to be cyclic for many species, but estimates made in 1985 and 1986 (State of Wyoming 1986f) indicate the population of major species probably exceeds a million animals:

Species	Estimated number
Mule deer	444,000
Pronghorn	372,300
Elk	64,100
White-tail deer	57,900
Moose	8,600
Bighorn sheep	6,300
Rocky Mountain goat	70
Black bear	Unknown
Mountain lion	Unknown

There seem to be lots of deer, pronghorn, and elk, a substantial number of moose and bighorn sheep, just a handful of Rocky Mountain goats, and some unknown (but probably not very large) number of black bear and mountain lions.

What about the grizzly bear? The "griz," the most publicized, most feared, and most controversial of Wyoming's animals, is just barely making it. Because they are considered a menace to humans and their livestock, these bears have have been killed in almost every way imaginable. When possible, problem bears have been relocated into the backcountry to get them, as well as humans, out of harm's way. The estimated 850 remaining grizzlies in northwestern Wyoming are finding less and less of the remote habitat necessary for their survival.

From the grizzly, big and fierce...

Also on the threatened or endangered species list are the greater sandhill crane, the peregrine falcon, and its desert cousin the prairie falcon. The decline in the sandhill crane population is largely due to the destruction of extensive marsh nesting habitat and their intolerance to human disturbance on nesting areas. The two falcons have not only been harassed by humans, but also have fallen victim to pesticide and other chemical poisoning in the food chain.

to the tiny warm springs dace...

One species of fish deserves special mention because it is an ecological curiosity. Attaining a length of only about 2 inches, the Warm Springs dace is confined to Kendall Warm Springs, a few miles northwest of Pinedale on the Bridger-Teton National Forest. Its total worldwide habitat is the 85 °F water in a small stream about 300 feet long, 10 feet wide, and 1 foot deep emanating from the springs and isolated from the Green River by a rocky waterfall some 8 feet high.

Many species of wildlife are indigenous to, or migrating to or through, the State. Some common ones of interest include bobcat, beaver, fox, mink, badger, coyote, hare, pheasant, wild turkey, ducks, geese, bald and golden eagles, and hawks.

Wyoming's wildlife is an extremely important economic asset both as a consumptive and nonconsumptive resource. Many tourists are attracted by the chance of sighting some of the less common and more secretive animals and birds. And, of course, there are the hunters and fishermen. In 1986 the Wyoming State Game and Fish Department spent about $16.4 million for its big game and sports fisheries management programs. During that same period, however, hunters and fishermen spent about $217 million for the opportunity to pursue the activities. In approximately 4.8 million recreation days some 149,000 big game animals were taken and 8.4 million fish were caught (State of Wyoming 1986f).

Wyoming's wildlife is an important asset.

The recent increased expansion of the energy industry, and the increase in population attendant to the development, have resulted in increased use pressure on the wildlife resource and other forms of recreation statewide. Management strategies for Wyoming's wildlife in the future will be influenced by the continued importance of development of the State's other natural resources—timber, minerals, and recreation opportunities.

Not all Wyoming's recreation is founded in wildlife or the forests. However, both are prime factors.

Recreation is big business. The recreation and travel industry generates nearly $800 million a year and employs nearly 19,000 people. Sales and excise taxes levied on tourists generated $22 million to the State and local communities in 1984, in addition to expenditures for transportation, lodging, and food. A good part of that was associated with outdoor recreation and somehow related to the forest land.

Recreation is big business...

Wyoming certainly has the facilities for outdoor recreation. Two National Parks—Yellowstone, the Nation's first, and Grand Teton—15 State parks, seven National Forests, and some National Monuments provide 251,000 acres of lakes, 16,500 miles of streams, and over 5,700 miles of developed hiking trails. The National Forests contain more than 3 million acres in 15 designated wilderness areas, nearly 10 percent of the National Wilderness Preservation System, and more than half that found in the Rocky Mountain States.

and why not? Wyoming has the attractions and facilities.

Winter sports? There are 13 ski areas of various sizes, 2,500 miles of snowmobile trails, and 4,600 miles of crosscountry ski trails. And they are used a lot.

In 1985 about 1.7 million people (mostly residents) visited the State parks, 5 million went to Yellowstone and Grand Teton National Parks, and the National Forests counted nearly 6 million recreation visitor days in 1986 (State of Wyoming 1986e and d; and USDA Forest Service 1987). The major activity (50 percent) was sightseeing. And why not? Camping and its close associates, hunting and fishing, made up a large part of the other recreation.

Grazing

One need only look at a Wyoming vehicle license plate to realize that livestock and the State's history are somehow related. Long before any permanent settlement of the "Cowboy State," cattle grazed the open rangelands and forests, sometimes having been driven from as far away as California. And not infrequently such herds were left unattended over the winter, free to roam wherever they could find food and shelter.

After more than a century of grazing...

In the early to mid-1800's, Wyoming was a place pioneers had to go through on their way to settle at a place of better promise farther west. There certainly was little to attract farmers looking to homestead a small tract as was being done farther east. There was a general lack of water, a ridiculously short growing season, and a climate that was plainly hostile. Settlements were established to protect and service the wagon trains moving west. Even the laying of the railroad along the same general transportation corridor during the 1860's was not to provide better access to Wyoming, but rather to establish a faster and safer linkage across the territory to the West Coast.

But it was apparent that even that harsh country could grow cattle, and the railroad provided good access to both eastern and western markets. The developing cattle industry was predicated on the free use of the open range and forests on public lands. In areas where there were forests, the grazing approach was much the same as today, moving with the seasons and available forage from lower to higher elevations and back down.

As in other Western States, overgrazing rather quickly became a problem, and the competition between cattle and sheep for forage on a deteriorating range caused serious problems. The Wyoming cattle industry peaked in the mid-1880's when an estimated 1.5 million head of livestock roamed the State. The drought of 1886, followed by the most severe winter on record in 1887, brought disaster and forced many ranchers out of business.

the forest land still produces forage...

How much grazing currently is done on forest land is difficult to determine, but that in National Forests, where much of it takes place, gives some clue. In 1986, about 347,000 head of livestock grazed some 700,000 animal unit months (an AUM is the amount of forage required by a 1,000-lb cow or its equivalent in 1 month). Of these animals, 145,000 were cattle, 199,000 sheep and goats, and about 3,000 were horses and burros (USDA Forest Service 1986a).

but not as much as previously.

Grazing in the forests naturally concentrates in those areas where there is forage and the livestock can walk; that translates into factors of stand density and topography, primarily. The open forests maintained by periodic uncontrolled wildfires offered conditions more favorable for good forage than the more dense timberlands of today.

Minerals

Wyoming is big in minerals.

Wyoming's substantial mineral estate includes extensive deposits of coal, oil, gas, uranium, bentonite (aluminum silicate clays), trona (a mineral heavy in sodium), and a few others that in 1984 were valued at some $6 billion (State of Wyoming 1986c).

The relationship between Wyoming's mineral estate and its forest land is simple—the forests are on the surface, the minerals below it. The surface resources have their own mix of high and often conflicting values. And to the extent that the occurrence of forest and minerals overlap, the use or development of one is usually at some expense to the other.

Mineral deposits worth over $6 billion in 1984...

generated $1 billion in income to the State.

In 1984 income to the State from minerals was about $1 billion. The extraction of minerals, whether from the surface or underground, causes some physical surface disturbance at the site. It can be severe, as in the case of strip mining, or have only minimal sustained impact, as in the case of oil and gas exploration and production. But there are other, more far-reaching impacts on forest resources associated with minerals development, especially during periods of accelerated activity.

Minerals development results in some economic and environmental impacts.

For example, during the 1970's and early 1980's when the domestic energy supply issue mushroomed to near panic, the population of Wyoming increased by more than 137,000, nearly equal that of the previous 50 years. Most of the increase was directly related to oil and gas exploration in the south-central and southwestern parts of the State. That population increase was like adding a new city more than five times the size of Cheyenne as it existed in 1970 (State of Wyoming 1986b). Meeting the requirements for housing, utilities, schools, and other services for such an increase in population was not done without economic and environmental impacts, good and bad.

Although the minerals industry in Wyoming has suffered recent economic setbacks, the general outlook is for the energy minerals industries to remain a vital source of jobs and income for the State. The management of the renewable resources is being planned in concert with minerals development so that all resources can be utilized without permanent damage to the land base.

THE TIMBER RESOURCE BASE

Wyoming's available timber resources are found on the 5.9 million acres of nonreserved timberland (table 2). However, because of some data gaps involving about 372,000 acres of National Forest lands, this section deals with only about 5.6 million acres.

Owners

The public owns most of the timberland.

Ownership of the timber resources is important in that it influences the availability of timber not already withdrawn from the possibility of harvesting. Timberland is either publicly owned or privately owned. In Wyoming, over 4 million of the 5.9 million acres of timberland are on public lands. Not surprisingly, the bulk of it—59 percent of the total and 81 percent of that on public lands—is in the seven National Forests. Private timberlands are found on ranches and the Wind River Indian Reservation. No timberlands are owned by forest industries.

Kinds and Sizes

Three forest types—lodgepole pine, ponderosa pine, and spruce-fir—make up 83 percent of Wyoming's timberlands (table 3). Hardwoods account for about 7 percent and include much of the cottonwood in streamside riparian zones.

Table 3--Area of timberland by ownership class, forest type, and stand-size class, Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand acres				
National Forest:						
	Douglas-fir	298.3	54.3	18.9	3.5	375.0
	Ponderosa pine	239.7	7.4	5.5	1.9	254.5
	Lodgepole pine	725.0	553.1	125.3	35.4	1,438.8
	Spruce-fir	832.0	67.9	71.6	16.6	988.1
	Hardwoods	43.7	55.7	11.8	5.1	116.3
	All types	2,138.7	738.4	233.1	62.5	3,172.7
Other public:						
	Douglas-fir	52.3	7.2	7.0	--	66.5
	Ponderosa pine	136.2	38.2	4.9	69.5	248.8
	Lodgepole pine	37.2	58.4	14.0	--	109.6
	Spruce-fir	106.7	84.8	45.4	84.4	321.3
	Hardwoods	--	33.3	26.4	--	59.7
	All types	332.4	221.9	97.7	153.9	805.9
Private:						
	Douglas-fir	59.7	12.9	2.8	--	75.4
	Ponderosa pine	612.7	82.9	94.8	114.7	905.1
	Lodgepole pine	61.8	43.8	8.1	8.1	121.8
	Spruce-fir	121.1	54.3	33.5	39.7	248.6
	Hardwoods	67.5	94.5	26.0	45.9	233.9
	All types	922.8	288.4	165.2	208.4	1,584.8
Total:						
	Douglas-fir	410.3	74.4	28.7	3.5	516.9
	Ponderosa pine	988.6	128.5	105.2	186.1	1,408.4
	Lodgepole pine	824.0	655.3	147.4	43.5	1,670.2
	Spruce-fir	1,059.8	207.0	150.5	140.7	1,558.0
	Hardwoods	111.2	183.5	64.2	51.0	409.9
	All types	3,393.9	1,248.7	496.0	424.8	5,563.4

Table 4--Area of timberland by stand-size class and ownership class, Wyoming, 1984

Stand-size class	Ownership class			
	National Forest	Other public	Private	Total
	Thousand acres			
Sawtimber stands	2,138.7	332.4	922.8	3,393.9
Poletimber stands	738.4	221.9	288.4	1,248.7
Sapling and seedling stands	233.1	97.7	165.2	495.3
Nonstocked areas	62.5	153.9	208.4	425.5
Total	3,172.7	805.9	1,584.8	5,563.4

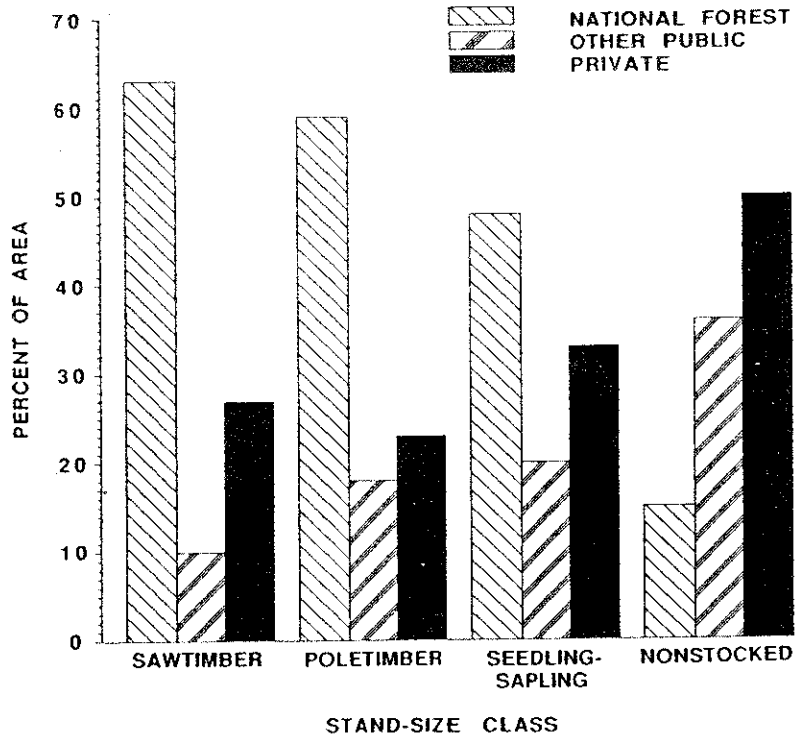


Figure 10—Distribution of stand-size classes among owners, Wyoming, 1984.

Sawtimber stands make up 61 percent of timberland.

Sawtimber stands are the rule on both public and private lands, accounting for 61 percent of the total timberland area (table 4 and fig. 10).

Much of the nonstocked forest land is privately owned.

Although less than 8 percent is considered nonstocked forest land, it represents about 425,000 acres with few or no trees where many could grow. About half the nonstocked area is on private land, but it is only 13 percent of the private timberland. National Forests, on the other hand, have the least, both in total acres and as a proportion of their total timberland.

Most stands have trees of all sizes.

Stand-size classes are simply descriptive in terms of relative tree sizes dominating the stand. They give no indication of the actual distribution of tree diameters within a stand (see definitions). Actually, most timber stands in most types have a rather wide range of tree diameters, especially in old stands. And as with most general statements, there are exceptions—in this case the even-aged stands of pure lodgepole pine or ponderosa pine where one tree seems to look like all the rest.

In the for-what-it's-worth department, there are an estimated 1.6 billion softwood growing-stock trees on Wyoming's timberlands, over half of which are lodgepole and ponderosa pine (table 5). Not surprising, almost 70 percent of them are in National Forests. Another important point is that 81 percent of all the growing-stock trees are less than 9 inches diameter at breast height (d.b.h.), the minimum size for sawtimber trees.

Wood Volume

Wyoming has about 8.4 billion ft³ of wood . . . mostly softwood species.

Wyoming's timberlands contain an estimated 8.4 billion cubic feet of wood in trees 5.0 inches d.b.h. and larger (table 6). That volume compressed into a single log 50 feet in diameter would stretch from Yellowstone Park to Minneapolis, a distance of some 800 miles. The board foot (Scribner) sawtimber volume in softwood species amounts to about 28.2 billion (table 7).

Softwood species account for 96 and 98 percent of the growing-stock and sawtimber volumes, respectively. Roughly three-fourths of the volume is in the National Forests, with lodgepole pine the major species (tables 6 and 7 and fig. 11). Although there are a lot of sawtimber-size trees, a third of the growing-stock volume of lodgepole pine is in poletimber-size trees. Of the sawtimber volume, 54 percent is in trees less than 15 inches in diameter.

Table 5--Number of growing-stock trees on timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	
	Million trees												
Douglas-fir	36.2	22.8	37.9	27.2	14.9	8.8	5.6	3.0	2.1	1.5	2.4	0.5	162.9
Ponderosa pine	51.3	50.2	39.2	29.4	21.1	15.1	9.5	4.6	2.7	1.2	1.1	--	225.4
Lodgepole pine	169.5	130.3	136.5	91.6	56.2	27.8	13.2	5.5	2.0	1.1	0.7	--	634.4
Limber pine	28.0	21.7	20.5	11.1	5.6	2.9	1.3	0.7	0.3	--	0.1	--	92.2
Whitebark pine[1]	5.5	3.0	4.2	4.4	4.5	3.6	2.0	1.1	0.5	0.4	0.3	0.1	29.6
True fir[1]	115.7	58.2	72.5	34.2	19.8	9.4	5.7	2.7	1.1	0.5	0.8	--	320.6
Spruce[1]	37.9	24.4	25.3	18.7	15.0	11.6	7.5	5.7	3.8	2.7	3.7	0.7	157.0
Total softwoods	444.1	310.6	336.1	216.6	137.1	79.2	44.8	23.3	12.5	7.4	9.1	1.3	1,622.1
Aspen	41.4	51.0	38.8	22.0	9.5	3.0	0.9	0.4	0.1	--	--	--	167.1
Cottonwood	--	1.1	0.7	0.8	0.7	0.3	0.5	0.1	0.1	0.1	0.3	0.1	4.8
Total hardwoods	41.4	52.1	39.5	22.8	10.2	3.3	1.4	0.5	0.2	0.1	0.3	0.1	171.9
All species	485.5	362.7	375.6	239.4	147.3	82.5	46.2	23.8	12.7	7.5	9.4	1.4	1,794.0

[1]In this and all following tables, species are combined as follows: true fir includes subalpine fir and white fir; spruce includes Engelmann spruce and blue spruce; whitebark pine includes bristlecone pine and other softwoods.

Table 6--Net volume of growing stock on timberland by species and ownership class, Wyoming, 1984

Species	Ownership class			
	National Forest	Other public	Private	Total
	Million cubic feet			
Douglas-fir	697.1	162.0	125.2	984.3
Ponderosa pine	203.7	162.0	736.4	1,102.1
Lodgepole pine	2,422.9	190.2	223.9	2,837.0
Limber pine	19.1	65.1	89.8	174.0
Whitebark pine	280.7	--	--	280.7
True fir	906.9	105.9	49.9	1,062.7
Spruce	1,490.3	56.1	90.4	1,636.8
Total softwoods	6,020.7	741.3	1,315.6	8,077.6
Aspen	66.3	78.7	135.9	280.9
Cottonwood	2.0	--	51.3	53.3
Total hardwoods	68.3	78.7	187.2	334.2
All species	6,089.0	820.0	1,502.8	8,411.8

Table 7--Net volume of sawtimber (Scribner rule) on timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, Scribner rule								
Douglas-fir	378.9	479.9	509.4	384.3	413.6	338.4	946.9	230.3	3,681.7
Ponderosa pine	455.1	708.3	768.5	583.7	489.9	285.4	374.1	24.6	3,689.6
Lodgepole pine	2,908.7	2,436.7	1,760.4	1,013.8	526.7	310.6	263.2	24.1	9,244.2
Limber pine	93.7	81.8	74.3	76.7	33.9	10.0	23.2	23.4	417.0
Whitebark pine	181.0	245.6	188.3	157.2	85.6	72.4	106.3	21.3	1,057.7
True fir	714.2	610.4	566.3	346.7	213.3	108.5	192.4	11.2	2,763.0
Spruce	563.8	867.1	900.2	961.8	942.4	775.3	1,833.3	535.6	7,379.5
Total softwoods	5,295.4	5,429.8	4,767.4	3,524.2	2,705.4	1,900.6	3,739.4	870.5	28,232.7
Aspen	XXXXX	140.5	65.3	29.1	8.7	5.5	0.5	--	249.6
Cottonwood	XXXXX	15.9	33.1	7.0	11.4	17.6	61.1	39.6	185.7
Total hardwoods	XXXXX	156.4	98.4	36.1	20.1	23.1	61.6	39.6	435.3
All species	5,295.4	5,586.2	4,865.8	3,560.3	2,725.5	1,923.7	3,801.0	910.1	28,668.0

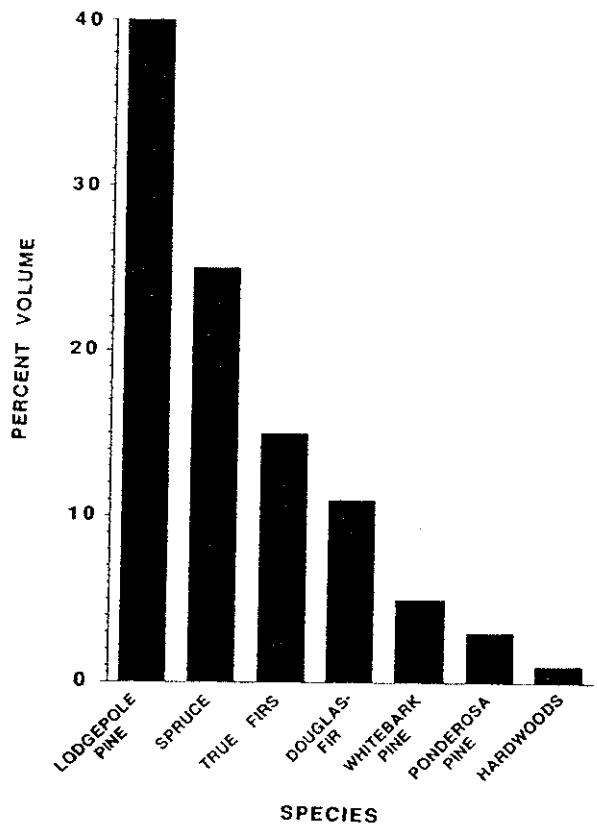


Figure 11—Percent growing-stock and sawtimber volume on National Forests by species.

Productivity

Productivity is affected by short growing seasons and low moisture.

Overall, Wyoming's timberlands have the potential to grow about 37 cubic feet of wood per acre per year. Roughly 20 percent has the capability of growing more than 50 cubic feet:

Productivity class	Area	Percent of total
Ft³/acre/year	*Thousand acres*	
0-19	1,231.4	22.1
20-49	3,236.7	58.2
50-84	949.3	17.1
85-119	146.0	2.6
Total	5,563.4	100.0

Realistically, there are no good reasons to expect anything different, considering the conditions under which the timberlands exist: poor, shallow soils, a generally short growing season made shorter by lower temperatures at higher elevations, and inadequate available moisture.

Nearly 80 percent of the poorest timberland is found in the National Forests (fig. 12). And because of their size alone, the National Forests have most of the better land as well. However, their overall productivity is considerably less than other owner groups because much of the high country is in the National Forests:

Owner group	Average productivity	
	All types	Softwood types
	Ft³/acre/year	
NFS	34.7	34.9
Other public	40.8	39.4
Private	38.5	35.2
Total	36.7	35.6

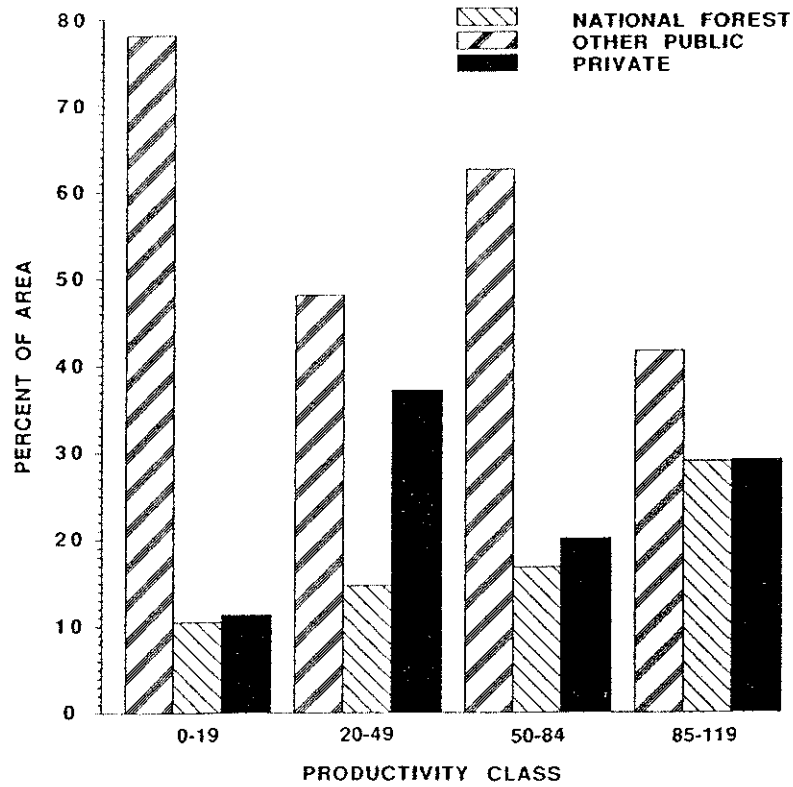


Figure 12—Distribution of timberland productivity classes among owners, Wyoming, 1984.

Forces of Change

The forest constantly changes.

In the forest, change is a constant. Plants and animals begin life, grow, and die. The human perception of recognizable change is either good or bad, depending on one's viewpoint and expectations. In terms of the timber resource as a source of primary wood products, interest focuses primarily on what is happening to it, the basic question being one concerning expected future wood volumes.

There are three elements of change that are important: growth, mortality, and removals.

Growth—Annual growth seems to be a good indicator of the general nature and condition of the timber. It is conventionally expressed in relation to some unit area, usually on a per-acre basis. But because trees die or are otherwise destroyed, it is the net growth that is important.

In 1983 mortality was half the gross growth.

In 1983, Wyoming's timberlands increased in volume by about 171 million cubic feet. Unfortunately, during that same year trees containing some 86 million cubic feet of wood died from one cause or another, leaving a net increase of about 86 million cubic feet (table 8), or approximately 10 percent of the growing-stock volume.

For all timberlands average growth is only 15.5 cubic feet per acre per year, less than half the potential. Actual net growth was well below potential for all three owner groups (fig. 13).

Biggest losses: lodgepole pine on National Forests.

Mortality—In 1983 the estimated volume in growing-stock trees 5.0 inches d.b.h. and larger lost to mortality was 85.5 million cubic feet, or about half the total growth for the year. A sobering, if not staggering, number. And that does not include the tens of thousands of seedlings and saplings that also died. Much of the mortality occurred in the National Forests. The hardest hit species was lodgepole pine, as it has been for several decades (table 9).

Information on causes of mortality in the National Forests was not available for this report, but such data were collected during the inventory of lands outside the National Forests. It seems reasonable to assume that the "agents of death" did not favor one owner group over another.

Except for spectacular events such as wildfires and severe weather, the exact cause of death often is difficult to determine. There are many insects and diseases constantly at work in the forest. Some can kill a tree quickly by themselves, but usually two or more attack in succession.

Insects and disease were the primary cause of loss.

The year 1983 was not noted for fires in Wyoming. The primary culprits of tree loss were insects and disease, with a slight edge to disease because of a surge in the activity of root rots (table 10 and fig. 14). But the insects also had their year, and the bark beetles continued to have their way with lodgepole pine and ponderosa pine.

The total story of the "forest bandits" is not told just by looking at mortality volume. Seed crops can be destroyed, growth can be significantly slowed, young trees deformed, and the quality or utility of the wood reduced.

What about salvage? Not all dead trees lose their use for wood products. However, salvage operations may be feasible only in areas of high concentrations of usable material reasonably close to markets. Lodgepole pine stands frequently offer such opportunities.

Table 8--Net annual growth of growing stock on timberland by species and ownership class, Wyoming, 1983

Species	Ownership class			
	National Forest	Other public	Private	Total
	Thousand cubic feet			
Douglas-fir	3,025.2	3,456.2	1,041.8	7,523.2
Ponderosa pine	391.0	3,007.1	14,273.0	17,671.1
Lodgepole pine	19,742.1	3,416.0	4,579.2	27,737.3
Limber pine	375.0	2,766.8	-122.1	3,019.7
Whitebark pine	582.5	--	--	582.5
True fir	9,383.3	3,804.8	1,784.1	14,972.2
Spruce	6,529.1	1,480.2	1,525.0	9,534.3
Total softwoods	40,028.2	17,931.1	23,081.0	81,040.3
Aspen	446.6	1,260.4	2,393.5	4,100.5
Cottonwood	--	--	891.4	891.4
Total hardwoods	446.6	1,260.4	3,284.9	4,991.9
All species	40,474.8	19,191.5	26,365.9	86,032.2

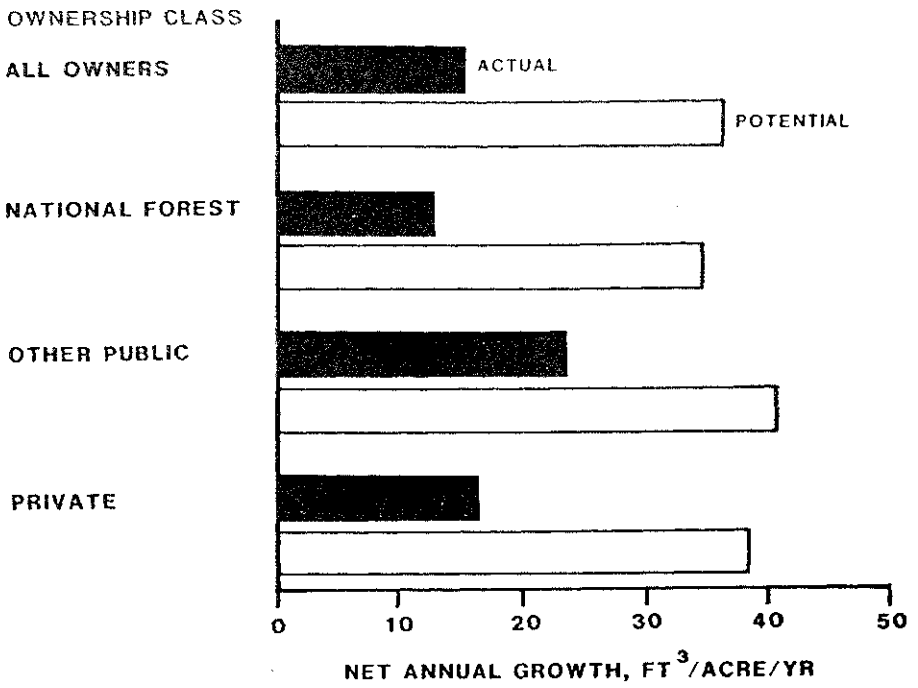


Figure 13—Potential and actual net annual growth on timberlands in Wyoming, 1983.

Table 9--Annual mortality of growing stock on timberland by species and ownership class, Wyoming, 1983

Species	Ownership class			
	National Forest	Other public	Private	Total
	Thousand cubic feet			
Douglas-fir	4,696.0	--	564.6	5,260.6
Ponderosa pine	8,541.0	747.5	1,824.0	11,112.5
Lodgepole pine	34,853.1	828.7	1,596.8	37,278.6
Limber pine	-133.0	628.0	1,890.6	2,385.6
Whitebark pine	1,575.0	--	--	1,575.0
True fir	9,911.4	965.2	75.8	10,952.4
Spruce	12,334.4	--	--	12,334.4
Total softwoods	71,777.9	3,169.4	5,951.8	80,899.1
Aspen	1,717.0	710.9	1,324.4	3,752.3
Cottonwood	--	--	403.8	403.8
Total hardwoods	1,717.0	710.9	1,728.2	4,156.1
All species	73,494.9	3,880.3	7,680.0	85,055.2

Table 10--Annual mortality of growing stock on timberland outside National Forests by species and cause of death, Wyoming, 1983

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand cubic feet								
Douglas-fir	--	--	--	--	564.6	--	--	--	564.6
Ponderosa pine	956.2	373.0	627.0	--	507.3	--	108.0	--	2,571.5
Lodgepole pine	1,317.9	828.7	148.8	--	--	--	--	130.0	2,425.4
Limber pine	290.5	1,785.2	--	--	287.0	--	--	156.0	2,518.7
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	433.5	350.8	--	--	--	--	--	256.7	1,041.0
Spruce	--	--	--	--	--	--	--	--	--
Total softwoods	2,998.1	3,337.7	775.8	--	1,358.9	--	108.0	542.7	9,121.2
Aspen	--	878.5	--	527.7	107.5	--	--	521.7	2,035.4
Cottonwood	--	--	--	397.7	--	--	--	6.0	403.7
Total hardwoods	--	878.5	--	925.4	107.5	--	--	527.7	2,439.1
All species	2,998.1	4,216.2	775.8	925.4	1,466.4	--	108.0	1,070.4	11,560.3

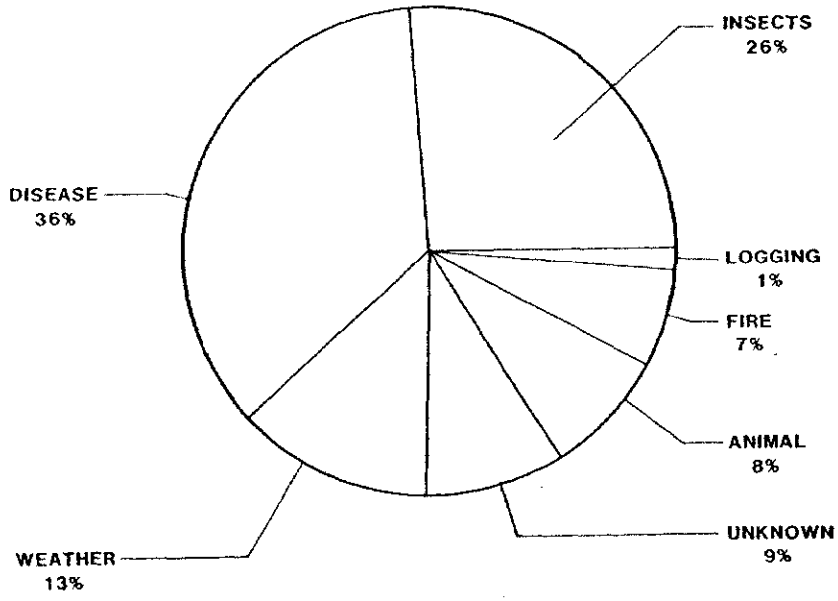


Figure 14—Distribution of annual mortality of growing stock on timberland outside National Forests by cause of death, Wyoming, 1983.

Some 30 million ft³ were harvested in 1983.

Removals—Removals represent volume eliminated from the standing inventory of growing-stock or sawtimber trees. Trees can be (1) removed for use as industrial roundwood products (sawlogs, posts, poles, and so on), (2) cut and used (or not) during thinning operations, (3) destroyed during logging operations or land clearing for some purpose, or (4) merely included in areas set aside for special uses such as wilderness. In any case these trees are no longer part of the timber inventory.

Most of the harvest was lodgepole and ponderosa pine...

In 1983 about 30 million cubic feet of industrial roundwood were removed from Wyoming's timberland, including 1.7 million cubic feet of dead material (McLain 1987b). Ponderosa pine and lodgepole pine accounted for about 89 percent of the industrial roundwood harvests (table 11 [McLain 1987b] and fig. 15).

Table 11--Cubic volume of industrial roundwood products harvested in Wyoming by species and ownership class, 1983

Species	Owner				
	National Forest	Other Federal[1]	State	Private	Total industrial[2]
	Thousand cubic feet				
True fir	414	89	--	--	503
Spruce	1,610	150	7	161	1,928
Lodgepole pine	11,069	744	34	582	12,429
Ponderosa pine	5,819	71	386	7,905	14,181
Douglas-fir	825	4	18	104	951
Other softwoods[3]	14	3	1	--	19
Cottonwood	7	--	--	--	7
Total[2]	19,759	1,062	446	8,752	30,019

[1]Lands managed by Federal agencies other than the USDA Forest Service, such as Department of Defense, Bureau of Land Management, and Bureau of Reclamation.
[2]Data may not add to totals due to truncating or rounding.
[3]Limber pine.

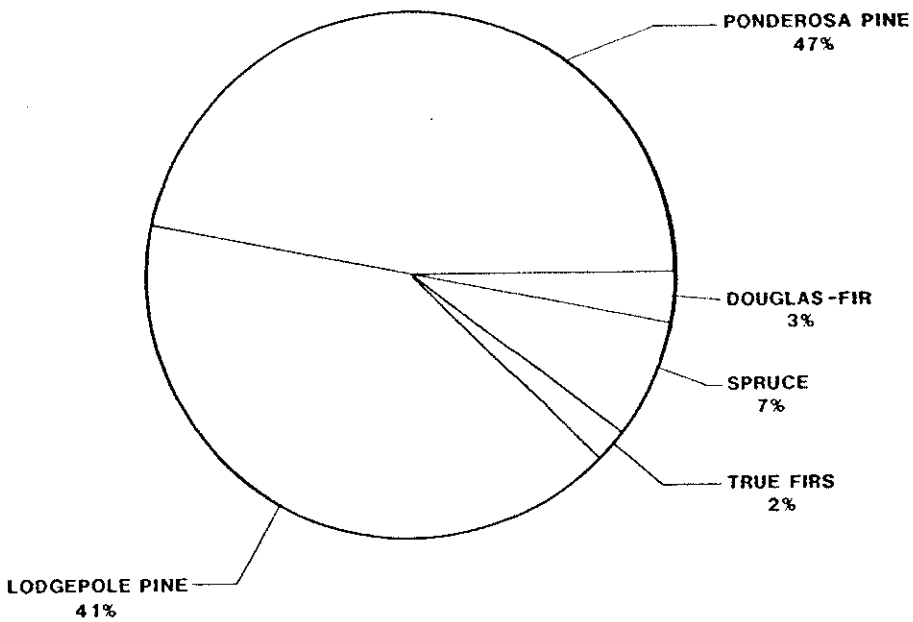


Figure 15—Percent removals of industrial roundwood products in Wyoming by species.

id two-thirds came om National Forests.

As might be expected, about two-thirds of the harvest came from the National Forests, with most of the rest cut from private land:

Owner group	Harvest	Percent of total
	Thousand cubic feet	
NFS	19,759	65.8
Other public	1,508	5.0
Private	8,752	29.2
Total	30,019	100.0

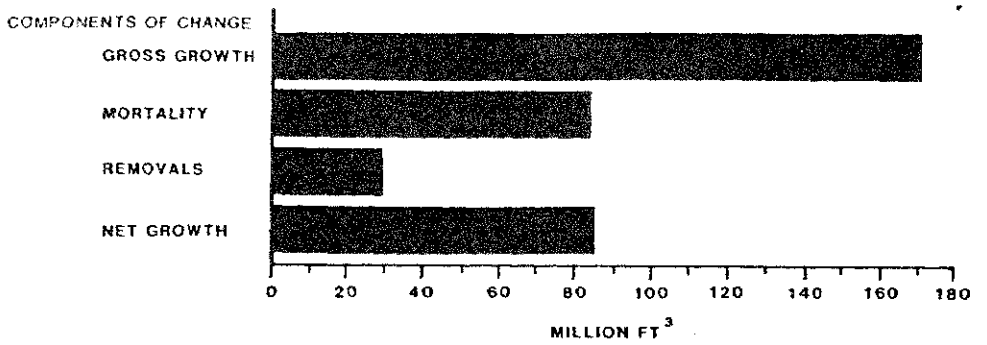


Figure 16—Gross annual growth, mortality, removals, and net annual growth in Wyoming.

Sawtimber removals were in the same proportion.

National Forests provided nearly all of the lodgepole pine, primarily from the Medicine Bow in Albany and Carbon Counties, and from the Bridger-Teton and Shoshone National Forests in Teton and Fremont Counties. Nearly all the ponderosa pine harvest was in Crook County, and over half was on private land.

About 23 percent of the harvest was delivered to processing mills outside the State, South Dakota being a major recipient.

The above removals figures represent mostly the volume in growing-stock trees delivered to the mills for processing. Another 1.8 million cubic feet of otherwise usable material was left on the ground at logging sites. That amounts to about 6 percent of the total removals (McLain 1988).

Some 10 million ft³ was cut for firewood . . . mostly from dead trees.

Another significant use of wood from Wyoming's timberland is as fuel. In 1983, some 143,000 cords were gathered by Wyoming residents for their stoves and fireplaces (McLain 1987a). All but about 27,000 cords came from public lands, principally the National Forests. About half was lodgepole pine, with ponderosa pine also a heavy favorite. Most of the fuelwood was dead material.

What It Means—Changes in Wyoming's softwood timberlands can be summarized as:

In 1983 net volume in the timberlands was increasing at about 52 million ft³ annually.

		Million cubic feet
Net volume 1983		8,026.1
Gross growth 1983	(+)	161.9
Mortality 1983	(–)	80.9
Removals 1983	(–)	30.1
Net volume 1984		8,077.6
Increase	(+)	51.5

Total growth of softwoods was about 162 million cubic feet of growing stock (fig. 16). Half the total growth was lost to mortality. After the dust from the logging trucks cleared there was a net increase in volume of nearly 52 million cubic feet, less than 1 percent of the total growing-stock volume. The hardwood volume is increasing at nearly four times the rate of softwood volume, due in large part to small amounts of hardwood inventory being harvested.

WOODLANDS

Area

Wyoming's 778,000 acres of woodland is mostly juniper . . .

Wyoming has nearly 778,000 acres of nonreserved woodland. This is approximately 8 percent of the total forest land in the State. Over three-fifths is publicly owned, and the rest is under private ownership. About 1,200 additional acres of nonreserved woodland are administered by the National Forests (table 12). Volume and growth data for these acres were unavailable. Hence, the following information pertains only to woodlands outside the National Forests.

Juniper is by far the dominant woodland forest type in Wyoming, occurring on 89 percent of the area (fig. 17; table 45 in appendix). Another 2 percent is occupied by the pinyon-juniper (P-J) forest type, where the range of common pinyon overlaps with various juniper species. Oak makes up about 3 percent of the woodlands, and other woodland types 6 percent.

Table 12--Area of forest land by forest type, ownership class, and land class, Wyoming, 1984

Forest type	Ownership class and land class											
	National forest			Other public			Private			All owners		
	Reserved	Non-reserved	Total	Reserved	Non-reserved	Total	Reserved	Non-reserved	Total	Reserved	Non-reserved	Total
	Thousand acres											
Douglas-fir	106.7	487.6	594.3	--	66.4	66.4	--	75.4	75.4	106.7	629.4	736.1
Ponderosa pine	(2)	254.5	254.5	1.3	249.0	250.3	--	905.1	905.1	1.3	1,408.6	1,409.9
Lodgepole pine	366.9	1,480.3	1,847.2	1,464.2	109.6	1,573.8	11.3	121.8	133.1	1,842.4	1,711.7	3,554.1
Spruce-fir[1]	797.7	1,142.8	1,940.5	278.5	321.2	599.7	75.5	248.5	324.0	1,151.7	1,712.5	2,864.2
Hardwoods[1]	6.5	179.3	185.8	7.6	59.7	67.3	0.8	233.9	234.7	14.9	472.9	487.8
Nonstocked	14.3	--	14.3	--	--	--	--	--	--	14.3	--	14.3
Total timberland	1,292.1	3,544.5	4,836.6	1,751.6	805.9	2,557.5	87.6	1,584.7	1,672.3	3,131.3	5,935.1	9,066.4
Pinyon-juniper	(2)	1.2	1.2	--	13.1	13.1	0.3	--	0.3	0.3	14.3	14.6
Juniper	--	--	--	3.4	441.9	445.3	--	249.1	249.1	3.4	691.0	694.4
Oak	--	--	--	--	6.7	6.7	--	21.0	21.0	--	27.7	27.7
Mountain brush[3]	--	--	--	--	13.5	13.5	--	--	--	--	13.5	13.5
Riparian	--	--	--	--	--	--	--	24.2	24.2	--	24.2	24.2
Other hardwoods	--	--	--	--	--	--	--	7.0	7.0	--	7.0	7.0
Total woodland	(2)	1.2	1.2	3.4	475.2	478.6	0.3	301.3	301.6	3.7	777.7	781.4
Total all types	1,292.1	3,545.7	4,837.8	1,755.0	1,281.1	3,036.1	87.9	1,886.0	1,973.9	3,135.0	6,712.8	9,847.8

[1]In this and all following tables, forest types are combined as follows: spruce-fir includes whitebark-limber pine, limber pine, spruce, Engelmann spruce, blue spruce, white spruce, bristlecone pine, and whitebark pine; hardwoods include aspen and cottonwood.
[2]Less than 0.05 thousand acres.
[3]Mountain brush, riparian, and other hardwoods forest types are shown separately on this table and table 41 only. These types are included in the "other woodland types" category in the remaining woodland tables.

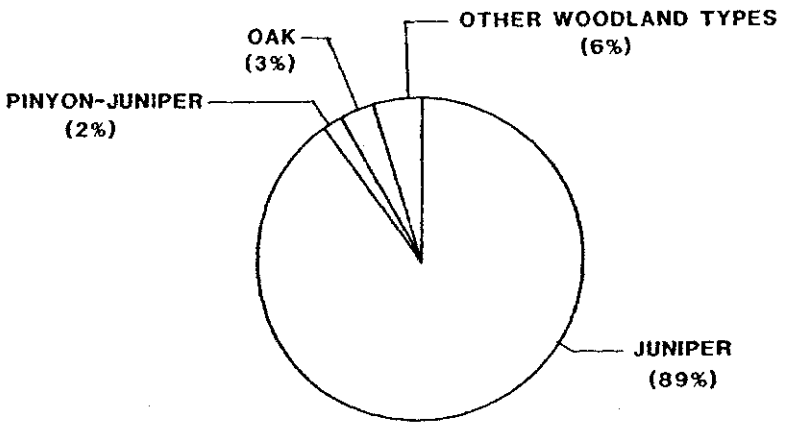


Figure 17—Distribution of woodland area by forest type, Wyoming, 1984.

Volume and Growth

with an estimated volume of 314 million ft³ . . . 47 million of it dead wood in live trees.

Total volume on woodlands was approximately 314 million cubic feet including nearly 47 million cubic feet of dead trees and the dead portion of live trees. Because juniper occupied most of the woodland area, it stands to reason it accounted for most of the volume. Nearly 185 million cubic feet (69 percent) of the live volume and over 31 million cubic feet (67 percent) of the dead volume were found in juniper stands (fig. 18). Another 4 million cubic feet of live volume was contributed by the pinyon-juniper type. Nearly one quarter of the total volume was in other woodland types.

Juniper may be number one in total volume, but the type ranks dead last in average volume per acre at around 313 cubic feet of live and dead wood (table 13). The other woodland types have over five times the total wood volume per acre, averaging nearly 1,700 cubic feet. The oak and pinyon-juniper types also average more wood per acre.

Table 13--Total and per acre volume, and total and per-acre net annual growth on woodlands outside National Forests by forest type, Wyoming

	Forest type				
	Pinyon-juniper	Juniper	Oak	Other woodland types	Total
Total volume (1984) (M cubic feet)	5,068	216,127	16,582	76,073	313,850
Average volume per acre (cubic feet)	388	313	599	1,700	
Net annual growth (1983) (M cubic feet)	63	1,673	288	1,260	3,284
Average net annual growth per acre (cubic feet)	5	2	10	28	

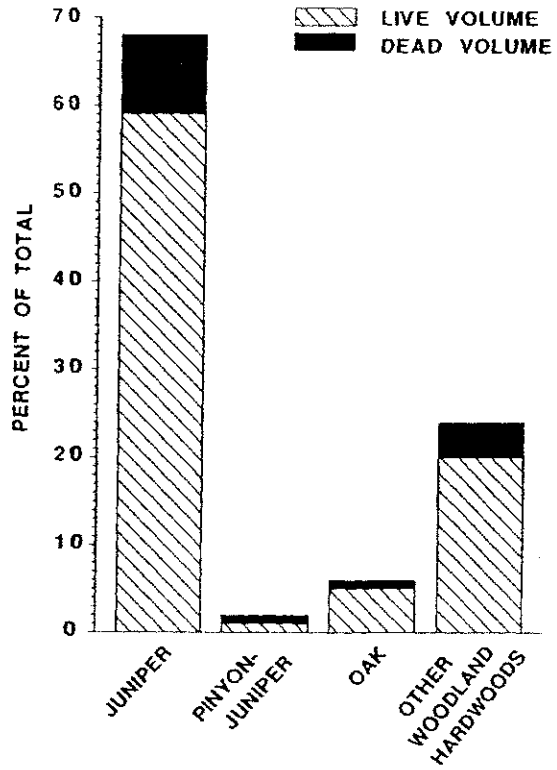


Figure 18—Distribution of live and dead volume on woodlands among forest types, Wyoming, 1984.

The same is true concerning the volume of net annual growth. Juniper accounts for over half of the 3.3 million cubic feet of net annual growth on woodland, again because there is more of it than any other woodland forest type. A comparison of average net annual growth, however, shows juniper producing only 2.4 cubic feet per acre. This is about half the rate of pinyon-juniper, its nearest "competitor," and nearly twelve times lower than the average rate of other woodland types (table 13).

Much of the difference in average volume and average growth per acre can be directly attributable to the site each forest type tends to occupy and on the species making up that forest type.

Growth is low because of sparse stands and harsh sites.

In general, the trend of increasing volume and growth from the juniper type to pinyon-juniper, oak, and finally other woodland types, is roughly indicative of increasing site quality. Juniper, by virtue of its hardiness and ability to successfully establish itself where other species fail, occupies some of the harshest, least productive sites found throughout the State. Also, juniper trees are often multiple-stemmed, small, and generally of poor form. The two factors together tend to limit the growth and volume production on a given site.

At the other extreme, the other woodland types include riparian areas, which can often rival the best timberland sites for productivity. Here, water is usually abundant, and the soils rich and deep, providing ideal conditions for growth. And willow tree species are major vegetative components of many riparian areas, often attaining diameters in excess of 12 inches and heights of more than 60 feet. The result is a higher growth rate and volume accumulation, on the average, than for any other woodland forest type.

Wood Products

Wyoming's woodlands will likely never challenge its timberlands in importance for commercial wood production, but woodlands do produce some products of relative value.

Woodlands provide mostly fuelwood and posts.

Juniper and oak species are assessed for potential use as fenceposts. An estimated 38,000 stems met the minimum criteria for lineposts, and another 17,000 qualified as the larger cornerposts (table 69 in appendix). About 72 percent of the lineposts and 70 percent of the cornerposts were in juniper species.

Christmas trees are another potential wood product from woodlands. Pinyon is the only species assessed for such use, and approximately 131,000 trees qualified (table 70 in appendix). All of these were rated standard grade and all were in the 11- to 12-foot height class.

Many woodland species, particularly juniper and oak, are excellent sources of firewood for the hearth. Although fuelwood harvest figures from Wyoming's woodlands are not available, it is likely that some of the State's residents have heated their homes with woodland fuels, if not regularly, then at least on a "when I can get it" basis.

FOREST INDUSTRIES

Forest industry in Wyoming dates back to the 1860's.

Historically, Wyoming's timber industry generally has been important only on a local level. It was the westward penetration of the railroads and the attendant construction of forts and settlements that took the first bite out of Wyoming's forests. Beginning in the 1860's, millions of ties were "hacked" and later sawn for the construction and maintenance of the railroads. As the railroad hurried across southern Wyoming on its way to Promontory, UT, ties were hacked from the north slope of the Uintah Mountains in Utah, and from as far away as the headwaters area of the Green River, and rafted downstream.

In 1866, a sawmill was established in the Bighorns to provide lumber for the construction of Fort Phil Kearney, then another in 1877 at Buffalo to build Fort McKinney. By 1898, there were six sawmills slicing up trees from the Bighorn Mountains—nearly 2 million board feet annually.

The number of operating mills fluctuates with market conditions.

Forest industry in Wyoming has never been known for its stability. It has been boom or bust (The Lowell Chronicle 1978). For example, in 1909 there were 88 processing mills in operation, by 1920 only 41; at the end of World War II there were 148, but by 1985 there were only 57 plants employing some 950 people. The mills were supplied by 375 workers in the logging industry.

Studmills currently dominate.

The nature of Wyoming's primary wood processing plants reflects the generally small size of roundwood available. Although sawmills dominate the industry, many are primarily studmills. The remainder are pole and post yards and house log plants (fig. 19; McLain 1987b).

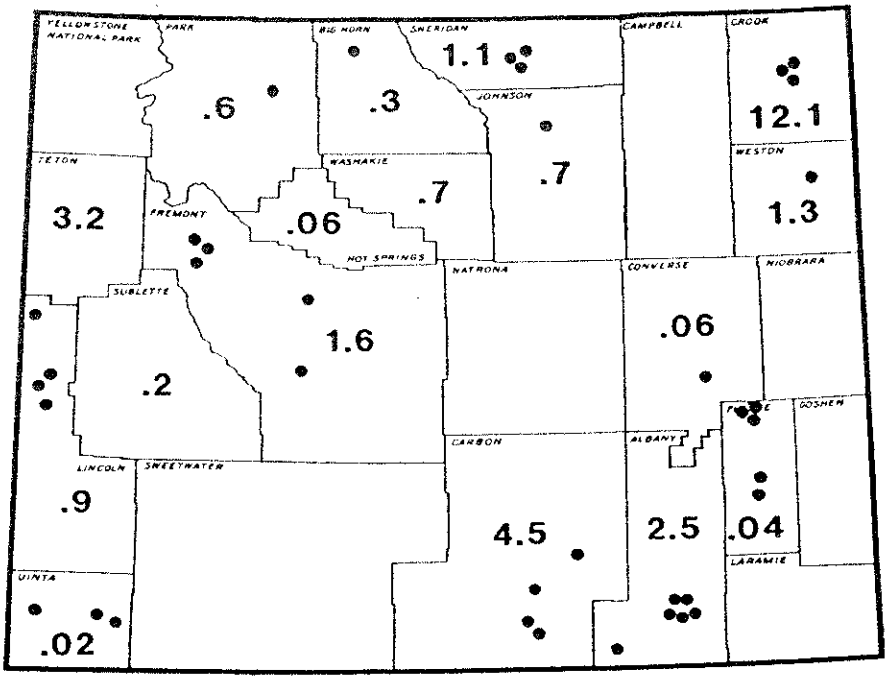


Figure 19—Industrial roundwood production by county in millions of cubic feet and locations of primary wood processors in Wyoming, 1983 (McLain 1987b).

WHAT'S AHEAD?

Obviously, no one knows. Speculation about the future nearly always leads to either prophecy or prediction, neither of which requires many, if any, data. But enough information is available to provide some clues as to what is, or is becoming, important. Looking objectively at the nature and use of Wyoming's forests can provide a perspective from which we may infer some reasonable expectations for their future management and use.

First of all, 80 percent of Wyoming's forest lands belong to the public; most is administered by Federal agencies, principally the Forest Service. The uniqueness of Wyoming's forested landscapes was recognized long ago by, for example, the creation of Yellowstone and Grand Teton National Parks. Since then, 3 million additional acres have been set aside in wilderness areas within the National Forests, and three additional areas are now under study for possible additions to the National Wilderness Preservation System. That totals 5.4 million acres gross area of which 3.1 million, or nearly 32 percent, is forest land.

Wyoming and other Rocky Mountain States seem to be heading toward new perceptions of the forest land. The preoccupation with timber as being the only resource of value has dimmed, emphasis shifting more to the use and enjoyment offered by the whole forest environment, not just the dominant vegetation, trees.

Wyoming's timberlands have never been in the Nation's mainstream of timber supplies, save the development of the railroad that promised prosperity by a coast-to-coast transportation linkage. However, since the Civil War, timber industry has been of high economic importance in local communities. And history has shown that "boom or bust" is a way of life in many of the milltowns.

Realistically, it is not in the cards for Wyoming ever to be a major timber-producing State. As noted, Wyoming's timberlands are dominated by small trees. Most of Wyoming's timberland has been either cut or burned since the mid-1860's, making most of the existing stands less than 140 years old. The generally low site quality and short growing season result in slow growth rates; but even with faster growth rates it takes longer to grow a large tree than a small one. And it takes more small trees to produce a 1,000 board feet of lumber than it does large trees.

In addition, increasing demands on the forests for uses other than timber make the availability of timber a major issue in terms of harvest levels.

Over the decades, many mills that have survived the pitfalls of the economy have become heavily dependent on timber from public lands. Increased emphasis, by the public, on use and enhancement of nontimber resources has caused economic heartburn in such communities when upswings in the demand for roundwood products indicate prosperity, but the raw material is not available to the mill in the quantities desired.

The disappointment is real because people are involved. Their livelihood is threatened or taken away when the mill closes, and the rest of the community suffers also. Unquestionably, some timber-dependent communities periodically or cyclically find themselves in an economic bind.

Nontimber resources of Wyoming's forests increase in importance to the State's economy. That increase will likely continue.

In reality, the economic stability of many communities, now dependent on publicly owned timber, is more related to people than the number of logs available for processing. The larger future role of Wyoming's forest land in the State and local economies may well have little to do with wood products but rather in attracting tourists. Satisfying the increasing demand for goods and services directly related to tourism and recreation, which even now generate millions of dollars of income to the State, could be the avenue to economic stability in many communities now foundering as milltowns.

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APPENDIX 1: TERMINOLOGY

Acceptable trees—Growing-stock trees meeting specified standards of size and quality but not qualifying as desirable trees.

Area condition class—A classification of timberland reflecting the degree to which the site is being utilized by growing-stock trees and other conditions affecting current and prospective timber growth (see Stocking):

Class 10—Areas fully stocked with desirable trees and not overstocked.
Class 20—Areas fully stocked with desirable trees but overstocked with all live trees.
Class 30—Areas medium to fully stocked with desirable trees and with less than 30 percent of the area controlled by other trees, or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees, or both.
Class 40—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees, or conditions that ordinarily prevent occupancy by desirable trees, or both.
Class 50—Areas poorly stocked 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 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 10 percent stocked with growing-stock trees.

Basal area—The cross-sectional area of a tree expressed in square feet. For timber species the calculation is based on diameter at breast height (d.b.h.); for woodland species it is based on diameter at root collar (d.r.c.).

Christmas tree grade—Pinyon species are classified as Christmas trees using the following guidelines:

Premium—Excellent conical form with no gaps in branches and a straight bole.
Standard—Good conical form with small gaps in branches and bole slightly malformed.
Utility—Conical in form with branches missing and bole bent or malformed.
Cull—Not meeting one of the above classifications or over 12 feet in height.

Cord—A pile of stacked wood equivalent to 128 cubic feet of wood and air space having standard dimensions of 4 by 4 by 8 feet.

Cull trees—Live trees that are unmerchantable now or prospectively (see Rough trees and Rotten trees).

Cull volume—Portions of a tree's volume that are not usable for wood products because of rot, missing or dead material, or other cubic-foot defect.

Deferred forest land—Forest lands within the National Forest System that are under study for possible inclusion in the National Wilderness Preservation System.

Desirable trees—Growing-stock trees (1) having no serious defect in quality to limit present or prospective use for timber products, (2) of relatively high vigor, and (3) containing no pathogens that may result in death or serious deterioration within the next decade.

Diameter at breast height (d.b.h.)—Diameter of the stem measured at 4.5 feet above the ground.

Diameter at root collar (d.r.c.)—Diameter equivalent at the point nearest the ground line that represents the basal area of the tree stem or stems.

Diameter classes—Tree diameters, either d.b.h. or d.r.c., grouped into 2-inch classes labeled by the midpoint of the class.

Farmer/rancher-owned lands—Lands owned by a person who operates a farm or a ranch and who either does the work or directly supervises the work.

Forest industry lands—Lands owned by companies or individuals operating a primary wood-processing plant.

Forest lands—Lands at least 10 percent stocked by forest trees of any size, including lands that formerly had such tree cover and that will be naturally or artificially regenerated. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest trees—Woody plants having a well-developed stem or stems, usually more than 12 feet in height at maturity, with a generally well-defined crown.

Forest type—A classification of forest land based upon and named for the tree species presently forming a plurality of live-tree stocking.

Gross annual growth—The average annual increase in the net volume of trees during a specified period.

Growing-stock trees—Live sawtimber trees, poletimber trees, saplings, and seedlings of timber species meeting specified standards of quality and vigor; excludes cull trees.

Growing-stock volume—Net cubic-foot volume in live poletimber-size and sawtimber-size growing-stock trees from a 1-foot stump to a minimum 4-inch top (of central stem) outside bark or to the point where the central stem breaks into limbs.

Growth—See definition for Net annual growth.

Hardwood trees—Dicotyledonous trees, usually broad-leaved and deciduous.

High-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are not expected to survive more than 10 years.

Indian lands—Indian lands held in trust by the Federal Government.

Industrial wood—All commercial roundwood products except fuelwood.

Land area—The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains, streams, sloughs, estuaries, and canals less than 120 feet wide; and lakes, reservoirs, and ponds less than 1 acre in size.

Logging residues—The unused portions of growing-stock trees cut or killed by logging.

Low-risk old-growth stands—Timber stands over 100 years old in which the majority of the trees are expected to survive more than 10 years.

Miscellaneous Federal lands—Lands administered by Federal agencies other than the U.S. Department of Agriculture, Forest Service, or U.S. Department of the Interior, Bureau of Land Management.

Mortality—The net volume of growing-stock trees that have died from natural causes during a specified period.

National Forest lands—Public lands administered by the U.S. Department of Agriculture, Forest Service.

National Resource lands—Public lands administered by the U.S. Department of the Interior, Bureau of Land Management.

Net annual growth—Gross annual growth minus average annual mortality.

Net dead volume—Total net volume of dead trees plus the net volume of dead material in live trees.

Net volume in board feet—The gross board-foot volume in the sawlog portion of growing-stock trees, less deductions for cull volume.

Net volume in cubic feet—Gross cubic-foot volume in the merchantable portion of trees less deductions for cull volume. For timber species, volume is computed for the merchantable stem from a 1-foot stump to a minimum 4-inch top diameter outside bark (d.o.b.), or to the point where the central stem breaks into limbs. For woodland species, volume is computed outside bark (o.b.) for all woody material above d.r.c. that is larger than 1.5 inches d.o.b.

Nonforest lands—Lands that do not currently qualify as forest land.

Nonindustrial private—All private ownerships except forest industry.

Nonstocked areas—Forest land less than 10 percent stocked with live trees.

Old-growth stands—Stands of timber species over 100 years old.

Other private lands—Privately owned lands other than forest industry or farmer owned.

Other public lands—Public lands administered by agencies other than the U.S. Department of Agriculture, Forest Service.

Other removals—The net volume of growing-stock trees removed from the inventory by cultural operations such as timber-stand improvement, by land clearing, and by changes in land use, such as a shift to wilderness.

Poletimber stands—Stands at least 10 percent stocked with growing-stock trees, in which half or more of the stocking is sawtimber or poletimber trees or both, with poletimber stocking exceeding that of sawtimber (see definition for Stocking).

Poletimber trees—Live trees of timber species at least 5 inches d.b.h. but smaller than sawtimber size.

Posts—Juniper and oak species are evaluated for post potential using the following criteria:

Line post—A 7-foot minimum length with 5 to 7 inches diameter at the butt, 2.5 inch minimum small end diameter, and reasonably straight and solid.

Corner post—An 8-foot minimum length with 7 to 9 inches diameter at the butt, 2.5 inch minimum small end diameter, and reasonably straight and solid.

Potential growth—The average net annual cubic-foot growth per acre at culmination of mean annual growth attainable in fully stocked natural stands.

Primary wood-processing plants—Plants using roundwood products such as sawlogs, pulpwood bolts, veneer logs, and so forth.

Productivity class—A classification of forest land that reflects biological potential. For timberlands the index used is the potential net annual growth at culmination of mean annual increment in fully stocked natural stands. For woodland, characteristics that affect the land's ability to produce wood, such as soil depth and aspect, are used. Furthermore, woodland is classified as high site where sustained wood production is likely, or low site where the continuous production of wood is unlikely.

Removals—The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations, land clearings, or changes in land use.

Reserved forest land—Forest land withdrawn from tree utilization through statute or administrative designation.

Residues:

Coarse residues—Plant residues suitable for chipping, such as slabs, edgings, and ends.

Fine residues—Plant residues not suitable for chipping, such as sawdust, shavings, and veneer clippings.

Plant residues—Wood materials from primary manufacturing plants that are not used for any product.

Rotten trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with more than half of the cull volume attributable to rotten or missing material.

Rough trees—Live poletimber or sawtimber trees with more than 67 percent of their total volume cull (cubic-foot) and with less than half of the cull volume attributable to rotten or missing material.

Roundwood—Logs, bolts, or other round sections cut from trees.

Salvable dead trees—Standing or down dead trees that are currently merchantable by regional standards.

Saplings—Live trees of timber species 1 to 4.9 inches d.b.h. or woodland species 1 to 2.9 inches d.r.c.

Sapling and seedling stands—Timberland stands at least 10 percent stocked on which more than half of the stocking is saplings or seedlings or both.

Sawlog portion—That part of the bole of sawtimber trees between a 1-foot stump and the sawlog top.

Sawlog top—The point on the bole of sawtimber trees above which a sawlog cannot be produced. The minimum sawlog top is 7 inches d.o.b. for softwoods and 9 inches d.o.b. for hardwoods.

Sawtimber stands—Stands at least 10 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.

Sawtimber trees—Live trees of timber species meeting regional size and defect specifications. Softwood trees must be at least 9 inches d.b.h. and hardwood trees 11 inches d.b.h.

Sawtimber volume—Net volume in board feet of the sawlog portion of live sawtimber trees.

Seedlings—Established live trees of timber species less than 1 inch d.b.h. or woodland species less than 1 inch d.r.c.

Softwood trees—Monocotyledonous trees, usually evergreen, having needle or scalelike leaves.

Standard error—An expression of the degree of confidence that can be placed on an estimated total or average obtained by statistical sampling methods. Standard errors do not include technique errors that could occur in photo classification of areas, field measurements, or compilation of data.

Stand-size classes—A classification of forest land based on the predominant size of trees present (see Sawtimber stands, Poletimber stands, and Sapling and seedling stands).

State, county, and municipal lands—Lands administered by States, counties, and local public agencies, or lands leased by these governmental units for more than 50 years.

Stocking—An expression of the extent to which growing space is effectively utilized by present or potential growing-stock trees of timber species.

Timberland—Forest land where timber species make up at least 10 percent stocking.

Timber species—Tree species traditionally used for industrial wood products. In the Rocky Mountain States, these include aspen and cottonwood hardwood species and all softwood species except pinyon and juniper.

Timber stand improvement—Treatments such as thinning, pruning, release cutting, girdling, weeding, or poisoning of unwanted trees aimed at improving growing conditions for the remaining trees.

Upper-stem portion—That part of the main stem or fork of sawtimber trees above the sawlog top to a minimum top diameter of 4 inches outside bark or to the point where the main stem or fork breaks into limbs.

Water—Streams, sloughs, estuaries, and canals more than 120 feet wide, and lakes, reservoirs, and ponds more than 1 acre in size at mean high water level.

Wilderness—An area of undeveloped land currently included in the Wilderness System, managed so as to preserve its natural conditions and retain its primeval character and influence.

Woodland—Forest land where timber species make up less than 10 percent stocking.

Woodland species—Tree species not usually converted into industrial wood products. Common uses are fuelwood, fenceposts, and Christmas trees.

APPENDIX II: HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and sample area levels.

Prefield

Primary area estimates were based on the classification of 253,115 sample points systematically placed on the latest aerial photographs available. The photo points, adjusted to meet known land areas by owner class, were used to stratify and compute expansion factors for the field sample data.

Field

Land classification and estimates for forest characteristics and volume were based on observations and measurements recorded at 7,613 ground sample locations, of which 502 were forested. Of the forested locations, 401 were classified as timberlands. Sample trees on timberland plots were selected using five-point cluster, which included 1/300-acre fixed radius plots for trees less than 5-inches d.b.h., and variable radius plots (40 BAF) for trees 5 inches d.b.h. or larger. Sample trees on woodland plots were selected using a 1/5-, 1/10-, or 1/20-acre fixed plot for trees 3 inches diameter at root collar (d.r.c.) and larger. Trees less than 3 inches d.r.c. were tallied on a 1/100-acre subplot.

Compilation

All photo and field data were entered into a computer for editing, computation, and tabulation. Final estimates from these data were based on statistical summaries, a portion of which are included in this bulletin. Volume and defect were computed using equations developed by Edminster and others (1980, 1982), Kemp (1958), Chojnacky (1985), Myers (1964), Myers and Edminster (1972). Defect for woodland species was computed from field observations.

Data Reliability

Individual cells within tables should be used with caution. Some are based on small sample sizes, which may result in high sampling errors. The standard error percentages shown in tables 71 and 72 were calculated at the 67 percent confidence level.

APPENDIX III: FOREST SURVEY TABLES

Tables for All Forest Lands in Wyoming

Table 14--Area of timberland by forest type, stand-size class, and productivity class, Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Thousand acres				
Douglas-fir:					
Sawtimber	13.0	133.6	156.0	107.7	410.3
Poletimber	--	3.9	49.1	21.4	74.4
Sapling and seedling	--	8.4	20.3	--	28.7
Nonstocked	--	0.4	0.5	2.6	3.5
Total	13.0	146.3	225.9	131.7	516.9
Ponderosa pine:					
Sawtimber	--	38.1	893.2	57.3	988.6
Poletimber	--	--	108.9	19.6	128.5
Sapling and seedling	--	--	104.5	0.7	105.2
Nonstocked	--	--	157.6	28.5	186.1
Total	--	38.1	1,264.2	106.1	1,408.4
Lodgepole pine:					
Sawtimber	--	104.7	476.3	243.0	824.0
Poletimber	--	21.1	476.6	157.6	655.3
Sapling and seedling	--	8.1	81.1	58.2	147.4
Nonstocked	--	0.4	18.9	24.2	43.5
Total	--	134.3	1,052.9	483.0	1,670.2
Spruce-fir:					
Sawtimber	82.5	381.4	318.3	277.6	1,059.8
Poletimber	--	57.5	116.2	33.3	207.0
Sapling and seedling	0.2	50.6	37.3	62.4	150.5
Nonstocked	--	15.4	36.5	88.8	140.7
Total	82.7	504.9	508.3	462.1	1,558.0
Hardwoods:					
Sawtimber	22.7	29.3	47.1	12.1	111.2
Poletimber	--	71.9	85.1	26.5	183.5
Sapling and seedling	7.6	16.0	36.1	4.5	64.2
Nonstocked	20.0	8.5	17.1	5.4	51.0
Total	50.3	125.7	185.4	48.5	409.9
All types:					
Sawtimber	118.2	687.1	1,890.9	697.7	3,393.9
Poletimber	--	154.4	835.9	258.4	1,248.7
Sapling and seedling	7.8	83.1	279.3	125.8	496.0
Nonstocked	20.0	24.7	230.6	149.5	424.8
Total	146.0	949.3	3,236.7	1,231.4	5,563.4

Table 15--Area of National Forest timberland by forest type, stand-size class, and productivity class, Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	Thousand acres				
Douglas-fir:					
Sawtimber	13.0	115.7	72.3	97.3	298.3
Poletimber	--	3.9	31.8	18.6	54.3
Sapling and seedling	--	1.4	17.5	--	18.9
Nonstocked	--	0.4	0.5	2.6	3.5
Total	13.0	121.4	122.1	118.5	375.0
Ponderosa pine:					
Sawtimber	--	38.1	180.1	21.5	239.7
Poletimber	--	--	7.4	--	7.4
Sapling and seedling	--	--	4.8	0.7	5.5
Nonstocked	--	--	1.9	--	1.9
Total	--	38.1	194.2	22.2	254.5
Lodgepole pine:					
Sawtimber	--	62.1	419.9	243.0	725.0
Poletimber	--	14.7	380.8	157.6	553.1
Sapling and seedling	--	--	67.1	58.2	125.3
Nonstocked	--	0.4	10.8	24.2	35.4
Total	--	77.2	878.6	483.0	1,438.8
Spruce-fir:					
Sawtimber	47.7	299.3	246.3	238.7	832.0
Poletimber	--	18.9	32.9	16.1	67.9
Sapling and seedling	0.2	14.6	21.5	35.3	71.6
Nonstocked	--	10.5	1.0	5.1	16.6
Total	47.9	343.3	301.7	295.2	988.1
Hardwoods:					
Sawtimber	--	10.2	24.2	9.3	43.7
Poletimber	--	2.3	26.9	26.5	55.7
Sapling and seedling	--	1.8	5.5	4.5	11.8
Nonstocked	--	--	2.5	2.6	5.1
Total	--	14.3	59.1	42.9	116.3
All types:					
Sawtimber	60.7	525.4	942.8	609.8	2,138.7
Poletimber	--	39.8	479.8	218.8	738.4
Sapling and seedling	0.2	17.8	116.4	98.7	233.1
Nonstocked	--	11.3	16.7	34.5	62.5
Total	60.9	594.3	1,555.7	961.8	3,172.7[1]

[1]The total area in this table of 3,172.7 thousand acres is the area of National Forest for which there is volume associated.

Table 16--Area of other publicly owned timberland by forest type, stand-size class, and productivity class, Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - - Thousand acres - - - - - - - - - -				
Douglas-fir:					
Sawtimber	--	15.1	29.6	7.6	52.3
Poletimber	--	--	7.2	--	7.2
Sapling and seedling	--	7.0	--	--	7.0
Nonstocked	--	--	--	--	--
Total	--	22.1	36.8	7.6	66.5
Ponderosa pine:					
Sawtimber	--	--	118.5	17.7	136.2
Poletimber	--	--	31.4	6.8	38.2
Sapling and seedling	--	--	4.9	--	4.9
Nonstocked	--	--	63.5	6.0	69.5
Total	--	--	218.3	30.5	248.8
Lodgepole pine:					
Sawtimber	--	22.1	15.1	--	37.2
Poletimber	--	6.4	52.0	--	58.4
Sapling and seedling	--	--	14.0	--	14.0
Nonstocked	--	--	--	--	--
Total	--	28.5	81.1	--	109.6
Spruce-fir:					
Sawtimber	34.8	27.4	33.3	11.2	106.7
Poletimber	--	22.7	55.7	6.4	84.8
Sapling and seedling	--	30.3	--	15.1	45.4
Nonstocked	--	--	26.3	58.1	84.4
Total	34.8	80.4	115.3	90.8	321.3
Hardwoods:					
Sawtimber	--	--	--	--	--
Poletimber	--	21.6	11.7	--	33.3
Sapling and seedling	7.6	6.4	12.4	--	26.4
Nonstocked	--	--	--	--	--
Total	7.6	28.0	24.1	--	59.7
All types:					
Sawtimber	34.8	64.6	196.5	36.5	332.4
Poletimber	--	50.7	158.0	13.2	221.9
Sapling and seedling	7.6	43.7	31.3	15.1	97.7
Nonstocked	--	--	89.8	64.1	153.9
Total	42.4	159.0	475.6	128.9	805.9

Table 17--Area of privately owned timberland by forest type, stand-size class, and productivity class, Wyoming, 1984

Forest type and stand-size class	Productivity class				Total acres
	85-119	50-84	20-49	0-19	
	- - - - - - - - - -		Thousand acres		- - - - - - - - -
Douglas-fir:					
Sawtimber	--	2.8	54.1	2.8	59.7
Poletimber	--	--	10.1	2.8	12.9
Sapling and seedling	--	--	2.8	--	2.8
Nonstocked	--	--	--	--	--
Total	--	2.8	67.0	5.6	75.4
Ponderosa pine:					
Sawtimber	--	--	594.6	18.1	612.7
Poletimber	--	--	70.1	12.8	82.9
Sapling and seedling	--	--	94.8	--	94.8
Nonstocked	--	--	92.2	22.5	114.7
Total	--	--	851.7	53.4	905.1
Lodgepole pine:					
Sawtimber	--	20.5	41.3	--	61.8
Poletimber	--	--	43.8	--	43.8
Sapling and seedling	--	8.1	--	--	8.1
Nonstocked	--	--	8.1	--	8.1
Total	--	28.6	93.2	--	121.8
Spruce-fir:					
Sawtimber	--	54.7	38.7	27.7	121.1
Poletimber	--	15.9	27.6	10.8	54.3
Sapling and seedling	--	5.7	15.8	12.0	33.5
Nonstocked	--	4.9	9.2	25.6	39.7
Total	--	81.2	91.3	76.1	248.6
Hardwoods:					
Sawtimber	22.7	19.1	22.9	2.8	67.5
Poletimber	--	48.0	46.5	--	94.5
Sapling and seedling	--	7.8	18.2	--	26.0
Nonstocked	20.0	8.5	14.6	2.8	45.9
Total	42.7	83.4	102.2	5.6	233.9
All types:					
Sawtimber	22.7	97.1	751.6	51.4	922.8
Poletimber	--	63.9	198.1	26.4	288.4
Sapling and seedling	--	21.6	131.6	12.0	165.2
Nonstocked	20.0	13.4	124.1	50.9	208.4
Total	42.7	196.0	1,205.4	140.7	1,584.8

Table 18--Area of woodland by forest type and ownership class, Wyoming, 1984

Forest type	Ownership class			
	National Forest	Other public	Private	Total
	- - - - - - - - - - - - Thousand acres - - - - - - - - - - - -			
Pinyon-juniper	1.2	13.1	--	14.3
Juniper	--	441.9	249.1	691.0
Total softwoods	1.2	455.0	249.1	705.3
Oak	--	6.7	21.0	27.7
Mountain brush	--	13.5	--	13.5
Riparian	--	--	24.2	24.2
Other hardwoods	--	--	7.0	7.0
Total hardwoods	--	20.2	52.2	72.4
All types	1.2	475.2	301.3	777.7

Table 19--Number of growing-stock trees on National Forest timberland by species and diameter class, Wyoming, 1984

Species	Diameter class (inches at breast height)												
	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	21.0-28.9	29.0+	All classes
	Million trees												
Douglas-fir	22.4	14.2	27.5	19.5	10.0	6.8	3.9	2.3	1.7	1.2	1.7	0.4	111.6
Ponderosa pine	14.9	13.9	7.4	5.6	4.3	2.9	1.8	1.1	0.5	0.3	0.1	--	52.8
Lodgepole pine	153.5	105.5	114.6	76.8	48.7	24.1	12.1	4.8	1.9	1.0	0.6	(1)	543.6
Limber pine	2.9	5.4	3.3	2.3	1.8	0.9	0.3	0.2	0.1	--	--	--	17.2
Whitebark pine	5.5	3.0	4.2	4.4	4.5	3.6	2.0	1.1	0.5	0.4	0.3	0.1	29.6
True fir	87.4	38.7	62.8	28.3	16.2	8.3	4.4	2.3	1.0	0.5	0.6	(1)	250.5
Spruce	30.1	22.3	24.2	15.9	13.4	10.8	6.5	5.2	3.4	2.4	3.5	0.7	138.4
Total softwoods	316.7	203.0	244.0	152.8	98.9	57.4	31.0	17.0	9.1	5.8	6.8	1.2	1,143.7
Aspen	21.8	29.4	17.2	8.2	3.8	1.3	0.3	0.1	--	--	--	--	82.1
Cottonwood	--	--	--	0.1	--	--	--	--	--	--	--	--	0.1
Total hardwoods	21.8	29.4	17.2	8.3	3.8	1.3	0.3	0.1	--	--	--	--	82.2
All species	338.5	232.4	261.2	161.1	102.7	58.7	31.3	17.1	9.1	5.8	6.8	1.2	1,225.9

[1]Less than 0.05 million trees.

Table 20--Number of growing-stock trees on other publicly owned timberland by species and diameter class, Wyoming, 1984

Species	Diameter class (inches at breast height)												
	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	21.0-28.9	29.0+	All classes
	Million trees												
Douglas-fir	4.3	3.7	5.4	4.8	3.3	1.0	0.9	0.3	0.2	0.2	0.3	0.1	24.5
Ponderosa pine	6.8	7.0	8.8	5.0	2.8	2.5	1.4	0.7	0.3	0.2	0.1	--	35.6
Lodgepole pine	9.0	7.6	10.7	6.8	4.3	1.8	0.5	0.1	(1)	(1)	(1)	--	40.8
Limber pine	15.2	10.2	11.6	5.3	1.6	0.8	0.3	0.2	0.1	(1)	--	--	45.3
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--	--	--
True fir	16.1	15.5	6.7	4.1	2.7	0.7	0.9	0.3	0.1	(1)	0.1	--	47.2
Spruce	--	--	--	1.3	0.9	0.2	0.4	0.1	0.1	0.1	0.1	(1)	3.2
Total softwoods	51.4	44.0	43.2	27.3	15.6	7.0	4.4	1.7	0.8	0.5	0.6	0.1	196.6
Aspen	9.7	11.9	5.1	5.3	2.0	0.7	0.3	0.1	--	--	--	--	35.1
Cottonwood	--	--	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	9.7	11.9	5.1	5.3	2.0	0.7	0.3	0.1	--	--	--	--	35.1
All species	61.1	55.9	48.3	32.6	17.6	7.7	4.7	1.8	0.8	0.5	0.6	0.1	231.7

[1]Less than 0.05 million trees.

Table 21--Number of growing-stock trees on privately owned timberland by species and diameter class, Wyoming, 1984

Species	Diameter class (inches at breast height)												
	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	21.0-28.9	29.0+	All classes
	Million trees												
Douglas-fir	9.5	4.9	5.0	2.9	1.6	1.0	0.8	0.4	0.2	0.1	0.4	(1)	26.8
Ponderosa pine	29.6	29.3	23.0	18.8	14.0	9.7	6.3	2.8	1.9	0.7	0.9	(1)	137.0
Lodgepole pine	7.0	17.2	11.2	8.0	3.2	1.9	0.6	0.6	0.1	0.1	0.1	--	50.0
Limber pine	9.9	6.1	5.6	3.5	2.2	1.2	0.7	0.3	0.1	(1)	0.1	(1)	29.7
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--	--	--
True fir	12.2	4.0	3.0	1.8	0.9	0.4	0.4	0.1	--	--	0.1	--	22.9
Spruce	7.8	2.1	1.1	1.5	0.7	0.6	0.6	0.4	0.3	0.2	0.1	(1)	15.4
Total softwoods	76.0	63.6	48.9	36.5	22.6	14.8	9.4	4.6	2.6	1.1	1.7	--	281.8
Aspen	9.9	9.7	16.5	8.5	3.7	1.0	0.3	0.2	0.1	(1)	--	--	49.9
Cottonwood	--	1.1	0.7	0.7	0.7	0.3	0.5	0.1	0.1	0.1	0.3	0.1	4.7
Total hardwoods	9.9	10.8	17.2	9.2	4.4	1.3	0.8	0.3	0.2	0.1	0.3	0.1	54.6
All species	85.9	74.4	66.1	45.7	27.0	16.1	10.2	4.9	2.8	1.2	2.0	0.1	336.4

[1]Less than 0.05 million trees.

Table 22--Net volume of sawtimber (International ¼-inch rule) on timberland by species and ownership class, Wyoming, 1984

Species	Ownership class			
	National Forest	Other public	Private	Total
	- - - Million board feet, International ¼-inch rule - - -			
Douglas-fir	3,062.3	607.9	511.1	4,181.3
Ponderosa pine	935.3	584.7	2,822.1	4,342.1
Lodgepole pine	9,358.2	455.2	617.2	10,430.6
Limber pine	83.9	119.6	288.8	492.3
Whitebark pine	1,188.4	--	--	1,188.4
True fir	2,668.3	323.6	132.8	3,124.7
Spruce	7,710.1	221.9	391.8	8,323.8
Total softwoods	25,006.5	2,312.9	4,763.8	32,083.2
Aspen	151.9	88.4	130.4	370.7
Cottonwood	8.2	--	206.8	215.0
Total hardwoods	160.1	88.4	337.2	585.7
All species	25,166.6	2,401.3	5,101.0	32,668.9

Table 23--Net volume of sawtimber (Scribner rule) on timberland by species and ownership class, Wyoming, 1984

Species	Ownership class			
	National Forest	Other public	Private	Total
	Million board feet, Scribner rule			
Douglas-fir	2,725.5	518.6	437.6	3,681.7
Ponderosa pine	832.5	489.8	2,367.3	3,689.6
Lodgepole pine	8,328.7	389.6	525.9	9,244.2
Limber pine	74.7	99.3	243.0	417.0
Whitebark pine	1,057.7	--	--	1,057.7
True fir	2,374.8	275.5	112.7	2,763.0
Spruce	6,861.8	188.1	329.6	7,379.5
Total softwoods	22,255.7	1,960.9	4,016.1	28,232.7
Aspen	135.2	75.3	111.2	321.7
Cottonwood	7.3	--	178.4	185.7
Total hardwoods	142.5	75.3	289.6	507.4
All species	22,398.2	2,036.2	4,305.7	28,740.1

Table 24--Net volume of growing stock on timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million cubic feet										
Douglas-fir	80.3	120.5	118.0	108.5	107.8	76.3	80.0	66.1	180.5	46.3	984.3
Ponderosa pine	61.2	125.3	175.3	197.4	183.6	126.6	99.8	55.1	73.2	4.6	1,102.1
Lodgepole pine	386.6	574.6	644.1	492.0	339.0	193.3	98.0	58.4	49.4	1.6	2,837.0
Limber pine	23.9	35.2	33.2	24.7	19.4	18.0	7.9	2.2	4.7	4.8	174.0
Whitebark pine	11.5	25.7	47.3	56.2	42.6	32.6	19.4	16.2	24.2	5.0	280.7
True fir	239.8	195.3	188.8	135.3	122.5	72.5	45.2	22.1	38.6	2.6	1,062.7
Spruce	60.1	93.5	138.2	183.3	185.6	190.8	182.8	151.5	339.2	111.8	1,636.8
Total softwoods	863.4	1,170.1	1,344.9	1,197.4	1,000.5	710.1	533.1	371.6	709.8	176.7	8,077.6
Aspen	56.4	87.7	78.3	32.9	15.2	7.1	2.1	1.1	0.1	--	280.9
Cottonwood	0.3	2.0	5.0	3.9	8.0	1.7	2.6	4.4	15.0	10.4	53.3
Total hardwoods	56.7	89.7	83.3	36.8	23.2	8.8	4.7	5.5	15.1	10.4	334.2
All species	920.1	1,259.8	1,428.2	1,234.2	1,023.7	718.9	537.8	377.1	724.9	187.1	8,411.8

Table 25--Net volume of growing stock on National Forest timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million cubic feet										
Douglas-fir	60.4	83.8	73.8	81.1	69.5	56.3	57.6	49.5	123.8	41.3	697.1
Ponderosa pine	10.7	22.1	31.6	35.9	33.2	30.1	17.9	13.1	9.1	--	203.7
Lodgepole pine	325.0	471.1	546.9	422.0	305.6	167.9	88.2	52.1	42.5	1.6	2,422.9
Limber pine	1.2	2.5	5.2	4.7	1.4	1.7	1.0	0.7	0.7	--	19.1
Whitebark pine	11.5	25.7	47.3	56.2	42.6	32.6	19.4	16.2	24.2	5.0	280.7
True fir	220.2	164.1	152.4	118.9	91.7	63.3	42.0	20.7	31.0	2.6	906.9
Spruce	57.3	77.5	121.7	167.4	157.9	173.4	166.1	139.9	319.3	109.8	1,490.3
Total softwoods	686.3	846.8	978.9	886.2	701.9	525.3	392.2	292.2	550.6	160.3	6,020.7
Aspen	16.7	17.5	19.1	8.2	3.0	1.4	--	0.3	0.1	--	66.3
Cottonwood	--	--	--	--	--	--	0.6	--	0.7	0.7	2.0
Total hardwoods	16.7	17.5	19.1	8.2	3.0	1.4	0.6	0.3	0.8	0.7	68.3
All species	703.0	864.3	998.0	894.4	704.9	526.7	392.8	292.5	551.4	161.0	6,089.0

Table 26--Net volume of growing stock on other publicly owned timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million cubic feet										
Douglas-fir	11.8	22.9	30.7	13.7	21.6	8.9	12.0	10.6	26.9	2.9	162.0
Ponderosa pine	13.7	20.2	22.0	33.6	28.9	17.8	11.4	9.6	4.8	--	162.0
Lodgepole pine	31.5	47.7	53.9	33.6	14.3	2.8	1.7	1.5	3.2	--	190.2
Limber pine	14.3	19.0	11.5	8.4	4.7	4.5	1.9	0.8	--	--	65.1
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--
True fir	11.8	19.6	27.2	9.9	21.9	6.4	3.2	1.4	4.5	--	105.9
Spruce	--	8.9	10.3	5.1	11.5	5.5	2.9	3.5	6.9	1.5	56.1
Total softwoods	83.1	138.3	155.6	104.3	102.9	45.9	33.1	27.4	46.3	4.4	741.3
Aspen	9.4	28.1	22.8	9.8	6.9	1.7	--	--	--	--	78.7
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	9.4	28.1	22.8	9.8	6.9	1.7	--	--	--	--	78.7
All species	92.5	166.4	178.4	114.1	109.8	47.6	33.1	27.4	46.3	4.4	820.0

Table 27--Net volume of growing stock on privately owned timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million cubic feet										
Douglas-fir	8.1	13.8	13.5	13.7	16.7	11.1	10.4	6.0	29.8	2.1	125.2
Ponderosa pine	36.8	83.0	121.7	127.9	121.5	78.7	70.5	32.4	59.3	4.6	736.4
Lodgepole pine	30.1	55.8	43.3	36.4	19.1	22.6	8.1	4.8	3.7	--	223.9
Limber pine	8.4	13.7	16.5	11.6	13.3	11.8	5.0	0.7	4.0	4.8	89.8
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--
True fir	7.8	11.6	9.2	6.5	8.9	2.8	--	--	3.1	--	49.9
Spruce	2.8	7.1	6.2	10.8	16.2	11.9	13.8	8.1	13.0	0.5	90.4
Total softwoods	94.0	185.0	210.4	206.9	195.7	138.9	107.8	52.0	112.9	12.0	1,315.6
Aspen	30.3	42.1	36.4	14.9	5.3	4.0	2.1	0.8	--	--	135.9
Cottonwood	0.3	2.0	5.0	3.9	8.0	1.7	2.0	4.4	14.3	9.7	51.3
Total hardwoods	30.6	44.1	41.4	18.8	13.3	5.7	4.1	5.2	14.3	9.7	187.2
All species	124.6	229.1	251.8	225.7	209.0	144.6	111.9	57.2	127.2	21.7	1,502.8

Table 28--Net volume of sawtimber (International ¼-inch rule) on timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule								
Douglas-fir	427.3	543.3	585.0	440.3	473.2	384.8	1,068.6	258.8	4,181.3
Ponderosa pine	572.4	835.7	902.1	686.6	569.2	325.5	422.9	27.7	4,342.1
Lodgepole pine	3,278.5	2,752.4	1,987.4	1,146.1	593.5	349.8	295.8	27.1	10,430.6
Limber pine	116.5	93.9	87.2	90.6	39.8	11.8	26.2	26.3	492.3
Whitebark pine	203.4	276.0	211.6	176.6	96.2	81.3	119.4	23.9	1,188.4
True fir	803.2	688.2	647.2	393.0	241.2	122.6	216.7	12.6	3,124.7
Spruce	633.8	978.0	1,022.2	1,088.1	1,066.4	873.0	2,060.5	601.8	8,323.8
Total softwoods	6,035.1	6,167.5	5,442.7	4,021.3	3,079.5	2,148.8	4,210.1	978.2	32,083.2
Aspen	XXXXX	162.0	76.3	34.2	10.3	6.3	0.6	--	289.7
Cottonwood	XXXXX	19.9	40.0	8.4	13.1	20.2	68.9	44.5	215.0
Total hardwoods	XXXXX	181.9	116.3	42.6	23.4	26.5	69.5	44.5	504.7
All species	6,035.1	6,349.4	5,559.0	4,063.9	3,102.9	2,175.3	4,279.6	1,022.7	32,587.9

Table 29--Net volume of sawtimber (International ¼-inch rule) on National Forest timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule								
Douglas-fir	282.1	420.5	394.7	337.0	353.8	295.3	749.4	229.5	3,062.3
Ponderosa pine	110.1	177.0	185.8	184.9	118.8	93.9	62.2	2.6	935.3
Lodgepole pine	2,936.6	2,440.5	1,820.6	1,014.7	542.4	317.0	259.3	27.1	9,358.2
Limber pine	27.1	24.7	7.3	10.2	5.7	4.3	4.6	--	83.9
Whitebark pine	203.4	276.0	211.6	176.6	96.2	81.3	119.4	23.9	1,188.4
True fir	675.4	616.2	497.6	348.4	225.3	115.6	177.2	12.6	2,668.3
Spruce	580.5	904.4	885.2	1,001.7	982.8	813.5	1,952.3	589.7	7,710.1
Total softwoods	4,815.2	4,859.3	4,002.8	3,073.5	2,325.0	1,720.9	3,324.4	885.4	25,006.5
Aspen	XXXXX	45.3	16.3	6.4	0.1	2.2	0.6	--	70.9
Cottonwood	XXXXX	--	--	--	3.8	--	4.4	--	8.2
Total hardwoods	XXXXX	45.3	16.3	6.4	3.9	2.2	5.0	--	79.1
All species	4,815.2	4,904.6	4,019.1	3,079.9	2,328.9	1,723.1	3,329.4	885.4	25,085.6

Table 30--Net volume of sawtimber (International ¼-inch rule) on other publicly owned timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule								
Douglas-fir	101.2	61.5	108.9	45.9	63.9	57.3	152.5	16.7	607.9
Ponderosa pine	73.7	140.4	140.5	90.5	61.1	52.3	26.2	--	584.7
Lodgepole pine	187.6	148.9	70.7	14.5	8.8	7.8	16.9	--	455.2
Limber pine	36.6	29.8	20.2	20.1	8.8	4.1	--	--	119.6
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	97.0	43.0	106.0	30.7	15.9	7.0	24.0	--	323.6
Spruce	32.8	23.9	57.5	27.6	14.5	18.1	38.6	8.9	221.9
Total softwoods	528.9	447.5	503.8	229.3	173.0	146.6	258.2	25.6	2,312.9
Aspen	XXXXX	46.4	33.8	8.2	--	--	--	--	88.4
Cottonwood	XXXXX	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	46.4	33.8	8.2	--	--	--	--	88.4
All species	528.9	493.9	537.6	237.5	173.0	146.6	258.2	25.6	2,401.3

Table 31--Net volume of sawtimber (International ¼-inch rule) on privately owned timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, International ¼-inch rule								
Douglas-fir	44.0	61.3	81.4	57.4	55.5	32.2	166.7	12.6	511.1
Ponderosa pine	388.6	518.3	575.8	411.2	389.3	179.3	334.5	25.1	2,822.1
Lodgepole pine	154.3	163.0	96.1	116.9	42.3	25.0	19.6	--	617.2
Limber pine	52.8	39.4	59.7	60.3	25.3	3.4	21.6	26.3	288.8
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	30.8	29.0	43.6	13.9	--	--	15.5	--	132.8
Spruce	20.5	49.7	79.5	58.8	69.1	41.4	69.6	3.2	391.8
Total softwoods	691.0	860.7	936.1	718.5	581.5	281.3	627.5	67.2	4,763.8
Aspen	XXXXX	70.3	26.2	19.6	10.2	4.1	--	--	130.4
Cottonwood	XXXXX	19.9	40.0	8.4	9.3	20.2	64.5	44.5	206.8
Total hardwoods	XXXXX	90.2	66.2	28.0	19.5	24.3	64.5	44.5	337.2
All species	691.0	950.9	1,002.3	746.5	601.0	305.6	692.0	111.7	5,101.0

Table 32--Net volume of sawtimber (Scribner rule) on National Forest timberland by species and diameter class, Wyoming, 1984

Species	Diameter class (inches at breast height)								All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
	Million board feet, Scribner rule								
Douglas-fir	251.1	374.2	351.3	299.9	314.9	262.8	667.0	204.3	2,725.5
Ponderosa pine	98.0	157.5	165.4	164.6	105.7	83.6	55.4	2.3	832.5
Lodgepole pine	2,613.6	2,172.0	1,620.3	903.1	482.7	282.1	230.8	24.1	8,328.7
Limber pine	24.1	22.0	6.5	9.1	5.1	3.8	4.1	--	74.7
Whitebark pine	181.0	245.6	188.3	157.2	85.6	72.4	106.3	21.3	1,057.7
True fir	601.1	548.4	442.9	310.1	200.5	102.9	157.7	11.2	2,374.8
Spruce	516.6	804.9	787.8	891.5	874.7	724.0	1,737.5	524.8	6,861.8
Total softwoods	4,285.5	4,324.6	3,562.5	2,735.5	2,069.2	1,531.6	2,958.8	788.0	22,255.7
Aspen	XXXXX	40.3	14.5	5.7	0.1	2.0	0.5	--	63.1
Cottonwood	XXXXX	--	--	--	3.4	--	3.9	--	7.3
Total hardwoods	XXXXX	40.3	14.5	5.7	3.5	2.0	4.4	--	70.4
All species	4,285.5	4,364.9	3,577.0	2,741.2	2,072.7	1,533.6	2,963.2	788.0	22,326.1

Table 33--Net volume of sawtimber (Scribner rule) on other publicly owned timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, Scribner rule								
Douglas-fir	88.8	52.8	90.1	37.5	52.3	48.2	134.1	14.8	518.6
Ponderosa pine	56.0	117.5	119.1	76.4	52.1	45.7	23.0	--	489.8
Lodgepole pine	162.0	126.4	59.5	12.2	7.6	6.8	15.1	--	389.6
Limber pine	28.4	25.9	17.2	17.0	7.4	3.4	--	--	99.3
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	85.8	37.2	87.5	25.3	12.8	5.6	21.3	--	275.5
Spruce	29.0	20.1	47.0	22.4	11.7	15.7	34.3	7.9	188.1
Total softwoods	450.0	379.9	420.4	190.8	143.9	125.4	227.8	22.7	1,960.9
Aspen	XXXXX	39.8	28.6	6.9	--	--	--	--	75.3
Cottonwood	XXXXX	--	--	--	--	--	--	--	--
Total hardwoods	XXXXX	39.8	28.6	6.9	--	--	--	--	75.3
All species	450.0	419.7	449.0	197.7	143.9	125.4	227.8	22.7	2,036.2

Table 34--Net volume of sawtimber (Scribner rule) on privately owned timberland by species and diameter class, Wyoming, 1984

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	21.0-28.9	29.0+	All classes
	Million board feet, Scribner rule								
Douglas-fir	39.0	52.9	68.0	46.9	46.4	27.4	145.8	11.2	437.6
Ponderosa pine	301.1	433.3	484.0	342.7	332.1	156.1	295.7	22.3	2,367.3
Lodgepole pine	133.1	138.3	80.6	98.5	36.4	21.7	17.3	--	525.9
Limber pine	41.2	33.9	50.6	50.6	21.4	2.8	19.1	23.4	243.0
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	27.3	24.8	35.9	11.3	--	--	13.4	--	112.7
Spruce	18.2	42.1	65.4	47.9	56.0	35.6	61.5	2.9	329.6
Total softwoods	559.9	725.3	784.5	597.9	492.3	243.6	552.8	59.8	4,016.1
Aspen	XXXXX	60.4	22.2	16.5	8.6	3.5	--	--	111.2
Cottonwood	XXXXX	15.9	33.1	7.0	8.0	17.6	57.2	39.6	178.4
Total hardwoods	XXXXX	76.3	55.3	23.5	16.6	21.1	57.2	39.6	289.6
All species	559.9	801.6	839.8	621.4	508.9	264.7	610.0	99.4	4,305.7

Table 35--Net annual growth of growing stock on timberland by species and diameter class, Wyoming, 1983

Species	Diameter class (inches at breast height)										All classes
	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	21.0-28.9	29.0+	
	Thousand cubic feet										
Douglas-fir	1,979.1	1,213.9	1,297.4	1,129.8	736.6	447.3	399.4	-291.0	577.3	33.4	7,523.2
Ponderosa pine	2,473.1	3,003.4	3,346.9	3,250.0	2,557.4	1,441.9	655.1	463.6	456.2	23.5	17,671.1
Lodgepole pine	8,544.8	5,932.6	5,184.2	3,966.9	2,185.7	788.4	516.6	239.2	297.9	81.0	27,737.3
Limber pine	2,417.6	827.3	342.7	-408.3	-256.7	201.4	-130.6	89.2	-76.3	13.4	3,019.7
Whitebark pine	25.2	183.4	57.4	85.2	40.5	72.6	4.2	--	114.0	--	582.5
True fir	5,298.3	3,058.0	2,588.5	1,498.0	1,342.9	459.0	396.2	120.0	201.3	10.0	14,972.2
Spruce	782.6	877.1	1,068.6	1,308.6	1,230.7	1,002.0	878.2	638.8	1,468.9	278.8	9,534.3
Total softwoods	21,520.7	15,095.7	13,885.7	10,830.2	7,837.1	4,412.6	2,719.1	1,259.8	3,039.3	440.1	81,040.3
Aspen	1,389.0	1,848.2	570.7	-100.1	211.0	160.5	11.5	9.7	--	--	4,100.5
Cottonwood	254.9	-28.5	-118.2	71.9	35.7	17.3	41.6	86.3	324.5	205.9	891.4
Total hardwoods	1,643.9	1,819.7	452.5	-28.2	246.7	177.8	53.1	96.0	324.5	205.9	4,991.9
All species	23,164.6	16,915.4	14,338.2	10,802.0	8,083.8	4,590.4	2,772.2	1,355.8	3,363.8	646.0	86,032.2

Table 36--Net annual growth of growing stock on National Forest timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	518.6	371.1	363.4	480.8	351.7	205.5	235.4	175.4	306.1	17.2	3,025.2
Ponderosa pine	--	49.0	33.0	65.0	81.0	65.0	98.0	--	--	--	391.0
Lodgepole pine	4,588.8	3,855.6	3,720.4	3,328.4	2,359.7	969.3	434.5	125.7	278.7	81.0	19,742.1
Limber pine	16.0	--	33.0	98.0	49.0	98.0	--	81.0	--	--	375.0
Whitebark pine	25.2	183.4	57.4	85.2	40.5	72.6	4.@	--	114.0	--	582.5
True fir	3,033.1	1,722.5	1,524.8	1,295.8	919.2	300.4	362.7	90.6	124.2	10.0	9,383.3
Spruce	647.8	382.7	624.0	971.2	735.0	689.2	565.4	436.9	1,220.2	256.7	6,529.1
Total softwoods	8,829.5	6,564.3	6,356.0	6,324.4	4,536.1	2,400.0	1,700.2	909.6	2,043.2	364.9	40,028.2
Aspen	166.6	91.9	25.2	42.6	5.1	115.2	--	--	--	--	446.6
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	166.6	91.9	25.2	42.6	5.1	115.2	--	--	--	--	446.6
All species	8,996.1	6,656.2	6,381.2	6,367.0	4,541.2	2,515.2	1,700.2	909.6	2,043.2	364.9	40,474.8

Table 37--Net annual growth of growing stock on other publicly owned timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	1,212.4	571.9	641.5	409.5	190.7	156.7	87.4	73.7	101.9	10.5	3,456.2
Ponderosa pine	993.0	376.2	475.3	585.1	212.1	259.3	-33.1	105.9	33.3	--	3,007.1
Lodgepole pine	1,463.2	746.9	976.8	577.3	-162.5	-229.3	25.2	8.5	9.9	--	3,416.0
Limber pine	1,845.4	489.6	387.3	-140.2	82.2	58.7	38.5	5.3	--	--	2,766.8
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--
True fir	1,698.4	808.7	784.8	27.4	257.1	138.9	33.5	29.4	26.6	--	3,804.8
Spruce	--	313.2	300.9	103.7	295.8	196.1	71.8	76.5	103.1	19.1	1,480.2
Total softwoods	7,212.4	3,306.5	3,566.6	1,562.8	875.4	580.4	223.3	299.3	274.8	29.6	17,931.1
Aspen	208.6	677.3	294.8	-40.3	105.0	15.0	--	--	--	--	1,260.4
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	208.6	677.3	294.8	-40.3	105.0	15.0	--	--	--	--	1,260.4
All species	7,421.0	3,983.8	3,861.4	1,522.5	980.4	595.4	223.3	299.3	274.8	29.6	19,191.5

Table 38--Net annual growth of growing stock on privately owned timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	248.1	270.9	292.5	239.5	194.2	85.1	76.6	-540.1	169.3	5.7	1,041.8
Ponderosa pine	1,480.1	2,578.2	2,838.6	2,599.9	2,264.3	1,117.6	590.2	357.7	422.9	23.5	14,273.0
Lodgepole pine	2,492.8	1,330.1	487.0	61.2	-11.5	48.4	56.9	105.0	9.3	--	4,579.2
Limber pine	556.2	337.7	-77.6	-366.1	-387.9	44.7	-169.1	2.9	-76.3	13.4	-122.1
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--
True fir	566.8	526.8	278.9	174.8	166.6	19.7	--	--	50.5	--	1,784.1
Spruce	134.8	181.2	143.7	233.7	199.9	116.7	241.0	125.4	145.6	3.0	1,525.0
Total softwoods	5,478.8	5,224.9	3,963.1	2,943.0	2,425.6	1,432.2	795.6	50.9	721.3	45.6	23,081.0
Aspen	1,013.8	1,079.0	250.7	-102.4	100.9	30.3	11.5	9.7	--	--	2,393.5
Cottonwood	254.9	-28.5	-118.2	71.9	35.7	17.3	41.6	86.3	324.5	205.9	891.4
Total hardwoods	1,268.7	1,050.5	132.5	-30.5	136.6	47.6	53.1	96.0	324.5	205.9	3,284.9
All species	6,747.5	6,275.4	4,095.6	2,912.5	2,562.2	1,479.8	848.7	146.9	1,045.8	251.5	26,365.9

Table 39--Annual mortality of growing stock on timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	860.0	1,004.0	728.5	465.7	397.9	379.4	233.7	677.9	387.5	126.0	5,260.6
Ponderosa pine	828.0	621.7	1,119.7	1,444.9	1,855.9	2,103.5	1,622.8	1,042.0	474.0	--	11,112.5
Lodgepole pine	11,043.3	9,275.7	7,924.8	4,614.3	1,144.3	2,014.2	717.3	139.2	500.5	-95.0	37,278.6
Limber pine	101.6	420.8	402.8	895.1	459.1	-95.0	193.2	-76.0	84.0	--	2,385.6
Whitebark pine	117.8	-38.0	874.9	158.5	227.2	323.5	22.9	21.2	-133.0	--	1,575.0
True fir	4,718.4	942.6	1,458.3	1,720.2	264.6	1,092.8	-6.8	61.4	578.7	122.2	10,952.4
Spruce	1,179.0	1,153.7	1,459.3	1,674.7	1,482.3	1,476.5	1,673.6	599.1	1,110.7	525.5	12,334.4
Total softwoods	18,848.1	13,380.5	13,968.3	10,973.4	5,831.3	7,294.9	4,456.7	2,464.8	3,002.4	678.7	80,899.1
Aspen	1,539.3	765.1	896.5	627.4	38.0	-114.0	--	--	--	--	3,752.3
Cottonwood	6.0	78.0	275.1	--	44.7	--	--	--	--	--	403.8
Total hardwoods	1,545.3	843.1	1,171.6	627.4	82.7	-114.0	--	--	--	--	4,156.1
All species	20,393.4	14,223.6	15,139.9	11,600.8	5,914.0	7,180.9	4,456.7	2,464.8	3,002.4	678.7	85,055.2

Table 40--Annual mortality of growing stock on National Forest timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	860.0	1,004.0	728.5	465.7	397.9	379.4	233.7	113.3	387.5	126.0	4,696.0
Ponderosa pine	549.0	227.0	701.0	1,098.0	1,496.0	1,837.0	1,117.0	1,042.0	474.0	--	8,541.0
Lodgepole pine	10,894.5	8,836.2	7,435.0	4,122.5	663.4	1,639.5	717.3	139.2	500.5	-95.0	34,853.1
Limber pine	19.0	57.0	57.0	-57.0	-38.0	-95.0	--	-76.0	--	--	-133.0
Whitebark pine	117.8	-38.0	874.9	158.5	227.2	323.5	22.9	21.2	-133.0	--	1,575.0
True fir	4,480.2	754.1	1,277.5	1,515.3	36.0	1,092.8	-6.8	61.4	578.7	122.2	9,911.4
Spruce	1,179.0	1,153.7	1,459.3	1,674.7	1,482.3	1,476.5	1,673.6	599.1	1,110.7	525.5	12,334.4
Total softwoods	18,099.5	11,994.0	12,533.2	8,977.7	4,264.8	6,653.7	3,757.7	1,900.2	2,918.4	678.7	71,777.9
Aspen	964.9	425.3	318.8	84.0	38.0	-114.0	--	--	--	--	1,717.0
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	964.9	425.3	318.8	84.0	38.0	-114.0	--	--	--	--	1,717.0
All species	19,064.4	12,419.3	12,852.0	9,061.7	4,302.8	6,539.7	3,757.7	1,900.2	2,918.4	678.7	73,494.9

Table 41--Annual mortality of growing stock on other publicly owned timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	--	--	--	--	--	--	--	--	--	--	--
Ponderosa pine	--	286.7	58.8	--	210.4	--	191.6	--	--	--	747.5
Lodgepole pine	--	293.7	--	--	290.3	244.7	--	--	--	--	828.7
Limber pine	82.6	207.8	--	337.6	--	--	--	--	--	--	628.0
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--
True fir	162.4	188.5	180.8	204.9	228.6	--	--	--	--	--	965.2
Spruce	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	245.0	976.7	239.6	542.5	729.3	244.7	191.6	--	--	--	3,169.4
Aspen	183.2	199.8	130.4	197.5	--	--	--	--	--	--	710.9
Cottonwood	--	--	--	--	--	--	--	--	--	--	--
Total hardwoods	183.2	199.8	130.4	197.5	--	--	--	--	--	--	710.9
All species	428.2	1,176.5	370.0	740.0	729.3	244.7	191.6	--	--	--	3,880.3

Table 42--Annual mortality of growing stock on privately owned timberland by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand cubic feet										
Douglas-fir	--	--	--	--	--	--	--	564.6	--	--	564.6
Ponderosa pine	279.0	108.0	359.9	346.9	149.5	266.5	314.2	--	--	--	1,824.0
Lodgepole pine	148.8	145.8	489.8	491.8	190.6	130.0	--	--	--	--	1,596.8
Limber pine	--	156.0	345.8	614.5	497.1	--	193.2	--	84.0	--	1,890.6
Whitebark pine	--	--	--	--	--	--	--	--	--	--	--
True fir	75.8	--	--	--	--	--	--	--	--	--	75.8
Spruce	--	--	--	--	--	--	--	--	--	--	--
Total softwoods	503.6	409.8	1,195.5	1,453.2	837.2	396.5	507.4	564.6	84.0	--	5,951.8
Aspen	391.2	140.0	447.3	345.9	--	--	--	--	--	--	1,324.4
Cottonwood	6.0	78.0	275.1	--	44.7	--	--	--	--	--	403.8
Total hardwoods	397.2	218.0	722.4	345.9	44.7	--	--	--	--	--	1,728.2
All species	900.8	627.8	1,917.9	1,799.1	881.9	396.5	507.4	564.6	84.0	--	7,680.0

Table 43--Area of timberland outside National Forests by forest type and area condition class, Wyoming, 1984

Forest type	Area condition class									Nonstocked	All classes
	10	20	30	40	50	60	70	80	90		
	Thousand acres										
Douglas-fir	--	--	--	2.8	29.7	30.7	8.4	--	70.3	--	141.9
Ponderosa pine	--	--	8.4	--	92.8	302.2	355.2	--	211.1	184.2	1,153.9
Lodgepole pine	--	--	--	19.2	73.5	53.8	30.3	--	46.5	8.1	231.4
Spruce-fir	--	--	6.7	28.4	69.7	104.9	140.8	2.8	92.6	124.0	569.9
Hardwoods	--	--	--	--	49.9	157.4	21.7	--	18.6	46.0	293.6
All types	--	--	15.1	50.4	315.6	649.0	556.4	2.8	439.1	362.3	2,390.7

Table 44--Area of woodland outside National Forests by ownership class, forest type, and productivity class, Wyoming, 1984

Ownership class	Forest type	Productivity class		All classes
		High	Low	
		Acres		
Other public:	Pinyon-juniper	13,071	--	13,071
	Juniper	245,339	196,522	441,861
	Oak	6,713	--	6,713
	Other	5,928	7,632	13,560
	Total	271,051	204,154	475,205
Private:	Pinyon-juniper	--	--	--
	Juniper	167,948	81,156	249,104
	Oak	20,971	--	20,971
	Other	20,057	11,136	31,193
	Total	208,976	92,292	301,268
Total:	Pinyon-juniper	13,071	--	13,071
	Juniper	413,287	277,678	690,965
	Oak	27,684	--	27,684
	Other	25,985	18,768	44,753
	Total	480,027	296,446	776,473

Table 45--Area of woodland outside National Forests by ownership class, forest type, and volume class, Wyoming, 1984

Ownership class	Forest type	Volume class			All classes
		0 - 500 cu ft/acre	500-1,000 cu ft/acre	1,000+ cu ft/acre	
		Acres			
Other public:	Pinyon-juniper	13,071	--	--	13,071
	Juniper	353,550	88,311	--	441,861
	Oak	--	6,713	--	6,713
	Other	13,560	--	--	13,560
	Total	380,181	95,024	--	475,205
Private:	Pinyon-juniper	--	--	--	--
	Juniper	197,983	46,977	4,145	249,105
	Oak	6,990	6,990	6,991	20,971
	Other	4,145	6,990	20,057	31,192
	Total	209,118	60,957	31,193	301,268
Total:	Pinyon-juniper	13,071	--	--	13,071
	Juniper	551,533	135,288	4,145	690,966
	Oak	6,990	13,703	6,991	27,684
	Other	17,705	6,990	20,057	44,752
	Total	589,299	155,981	31,193	776,473

Table 46--Number of cull and salvable dead trees on timberland outside National Forests by ownership class, and softwoods and hardwoods, Wyoming, 1984

Ownership class and species group	Cull trees			Salvable dead trees	Total
	Rough	Rotten	Total		
	Thousand trees				
Other public:					
Softwoods	1,249.0	1,517.7	2,766.7	13,351.8	16,118.5
Hardwoods	--	956.0	956.0	4,116.4	5,072.4
Total	1,249.0	2,473.7	3,722.7	17,468.2	21,190.9
Private:					
Softwoods	1,506.0	252.1	1,758.1	13,439.4	15,197.5
Hardwoods	601.5	1,282.5	1,884.0	9,501.6	11,385.6
Total	2,107.5	1,534.6	3,642.1	22,941.0	26,583.1
Total:					
Softwoods	2,755.0	1,769.8	4,524.8	26,791.2	31,316.0
Hardwoods	601.5	2,238.5	2,840.0	13,618.0	16,458.0
Total	3,356.5	4,008.3	7,364.8	40,409.2	47,774.0

Table 47--Number of trees on woodland outside National Forests by ownership class, species, and diameter class, Wyoming, 1984

Ownership class and species	Diameter class (inches at root collar)															
	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+	All classes
	Thousand trees															
Other public:																
Pinyon	--	--	131	261	261	--	--	--	--	--	--	--	--	--	--	653
Juniper	33,170	11,784	9,439	8,126	5,513	5,405	3,166	3,972	3,064	1,479	1,190	1,303	768	207	751	89,337
Oak	--	134	134	134	--	269	134	--	--	--	--	--	--	--	--	805
Mtn. mahogany	10,344	1,123	534	348	195	119	76	--	--	--	--	--	--	--	--	12,739
Other	--	134	134	--	--	--	--	--	--	--	--	--	--	--	--	268
Total	43,514	13,175	10,372	8,869	5,969	5,793	3,376	3,972	3,064	1,479	1,190	1,303	768	207	751	103,802
Private:																
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	13,274	4,922	5,329	3,858	3,810	1,578	1,600	982	1,428	1,295	411	433	473	--	591	39,984
Oak	--	1,957	2,517	1,118	699	419	280	--	--	--	--	--	--	--	--	6,990
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	1,003	4,072	2,095	1,426	824	1,684	602	140	140	201	200	--	--	--	201	12,588
Total	14,277	10,951	9,941	6,402	5,333	3,681	2,482	1,122	1,568	1,496	611	433	473	--	792	59,562
Total:																
Pinyon	--	--	131	261	261	--	--	--	--	--	--	--	--	--	--	653
Juniper	46,444	16,706	14,768	11,984	9,323	6,983	4,766	4,954	4,492	2,774	1,601	1,736	1,241	207	1,342	129,321
Oak	--	2,091	2,651	1,252	699	688	414	--	--	--	--	--	--	--	--	7,795
Mtn. mahogany	10,344	1,123	534	348	195	119	76	--	--	--	--	--	--	--	--	12,739
Other	1,003	4,206	2,229	1,426	824	1,684	602	140	140	201	200	--	--	--	201	12,856
Total	57,791	24,126	20,313	15,271	11,302	9,474	5,858	5,094	4,632	2,975	1,801	1,736	1,241	207	1,543	163,364

Table 48--Net volume of timber on timberland outside National Forests by class of timber, and softwoods and hardwoods, Wyoming, 1984

Class of timber	Softwoods	Hardwoods	Total
	Thousand cubic feet		
Sawtimber trees:			
Sawlog portion	1,359,698.2	68,051.1	1,427,749.3
Upper-stem portion	196,586.1	21,472.3	218,058.4
Total	1,556,284.3	89,523.4	1,645,807.7
Poletimber trees	500,450.0	176,327.0	676,777.0
All growing-stock trees	2,056,734.3	265,850.4	2,322,584.7
Rough cull trees	5,852.1	1,455.4	7,307.5
Rotten cull trees	3,884.3	5,427.8	9,312.1
Salvable dead trees	150,219.6	30,339.0	180,558.6
All timber	2,216,690.3	303,072.6	2,519,762.9

Table 49--Net volume of growing stock on timberland outside National Forests by ownership class, forest type, and stand-size class, Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand cubic feet				
Other public:						
	Douglas-fir	112,651.9	17,097.9	1,441.8	--	131,191.6
	Ponderosa pine	136,061.4	20,772.8	2,898.9	4,882.4	164,615.5
	Lodgepole pine	64,954.9	104,597.8	260.4	--	169,813.1
	Spruce-fir	210,689.1	56,974.4	15,861.6	3,432.0	286,957.1
	Hardwoods	--	61,218.4	6,066.0	--	67,284.4
	All types	524,357.3	260,661.3	26,528.7	8,314.4	819,861.7
Private:						
	Douglas-fir	96,690.2	15,220.4	272.7	--	112,183.3
	Ponderosa pine	646,872.0	48,779.0	27,794.4	8,752.4	732,197.8
	Lodgepole pine	120,087.4	85,455.2	3,625.8	697.5	209,865.9
	Spruce-fir	210,102.3	45,437.9	5,368.8	3,427.7	264,336.7
	Hardwoods	81,328.3	86,534.7	7,376.4	8,900.1	184,139.5
	All types	1,155,080.2	281,427.2	44,438.1	21,777.7	1,502,723.2
Total:						
	Douglas-fir	209,342.1	32,318.3	1,714.5	--	243,374.9
	Ponderosa pine	782,933.4	69,551.8	30,693.3	13,634.8	896,813.3
	Lodgepole pine	185,042.3	190,053.0	3,886.2	697.5	379,679.0
	Spruce-fir	420,791.4	102,412.3	21,230.4	6,859.7	551,293.8
	Hardwoods	81,328.3	147,753.1	13,442.4	8,900.1	251,423.9
	All types	1,679,437.5	542,088.5	70,966.8	30,092.1	2,322,584.9

Table 50--Net volume of sawtimber (International ¼-inch rule) on timberland outside National Forests by ownership class, forest type, and stand-size class, Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand board feet, International ¼-inch rule				
Other public:						
	Douglas-fir	435,889.0	29,483.6	6,291.3	--	471,663.9
	Ponderosa pine	512,520.3	31,523.1	8,722.8	20,283.2	573,049.4
	Lodgepole pine	212,458.1	147,254.1	--	--	359,712.2
	Spruce-fir	782,504.2	82,964.8	31,086.7	5,092.1	901,647.8
	Hardwoods	--	79,846.2	15,375.1	--	95,221.3
	All types	1,943,371.6	371,071.8	61,475.9	25,375.3	2,401,294.6
Private:						
	Douglas-fir	332,904.9	31,784.7	1,355.9	--	366,045.5
	Ponderosa pine	2,598,665.8	80,134.3	80,221.1	35,194.8	2,794,216.0
	Lodgepole pine	427,645.4	109,045.1	7,475.7	2,135.5	546,301.7
	Spruce-fir	881,364.4	73,510.0	6,205.5	8,000.0	969,079.9
	Hardwoods	291,174.4	82,260.4	20,473.1	31,435.4	425,343.3
	All types	4,531,754.9	376,734.5	115,731.3	76,765.7	5,100,986.4
Total:						
	Douglas-fir	768,793.9	61,268.3	7,647.2	--	837,709.4
	Ponderosa pine	3,111,186.1	111,657.4	88,943.9	55,478.0	3,367,265.4
	Lodgepole pine	640,103.5	256,299.2	7,475.7	2,135.5	906,013.9
	Spruce-fir	1,663,868.6	156,474.8	37,292.2	13,092.1	1,870,727.7
	Hardwoods	291,174.4	162,106.6	35,848.2	31,435.4	520,564.6
	All types	6,475,126.5	747,806.3	177,207.2	102,141.0	7,502,281.0

Table 51--Net volume of sawtimber (Scribner rule) on timberland outside National Forests by ownership class, forest type, and stand-size class, Wyoming, 1984

Ownership class	Forest type	Stand-size class				All classes
		Sawtimber	Poletimber	Sapling/ seedling	Nonstocked	
		Thousand board feet, Scribner rule				
Other public:						
	Douglas-fir	370,546.3	25,506.9	4,900.4	--	400,953.6
	Ponderosa pine	431,963.2	24,539.5	6,986.4	16,449.3	479,938.4
	Lodgepole pine	182,284.3	126,988.9	--	--	309,273.2
	Spruce-fir	664,446.1	70,217.0	26,133.6	4,460.3	765,257.0
	Hardwoods	--	68,252.8	12,549.0	--	80,801.8
	All types	1,649,239.9	315,505.1	50,569.4	20,909.6	2,036,224.0
Private:						
	Douglas-fir	283,017.3	26,446.8	1,119.4	--	310,583.5
	Ponderosa pine	2,183,760.6	65,330.1	64,495.2	29,610.4	2,343,196.3
	Lodgepole pine	363,313.7	93,568.3	6,400.7	1,899.5	465,182.2
	Spruce-fir	747,907.1	61,924.7	5,027.6	6,651.7	821,511.1
	Hardwoods	250,578.5	70,397.7	17,162.1	27,076.2	365,214.5
	All types	3,828,577.2	317,667.6	94,205.0	65,237.8	4,305,687.6
Total:						
	Douglas-fir	653,563.6	51,953.7	6,019.8	--	711,537.1
	Ponderosa pine	2,615,723.8	89,869.6	71,481.6	46,059.7	2,823,134.7
	Lodgepole pine	545,598.0	220,557.2	6,400.7	1,899.5	774,455.4
	Spruce-fir	1,412,353.2	132,141.7	31,161.2	11,112.0	1,586,768.1
	Hardwoods	250,578.5	138,650.5	29,711.1	27,076.2	446,016.3
	All types	5,477,817.1	633,172.7	144,774.4	86,147.4	6,341,911.6

Table 52--Net volume of growing stock on timberland outside National Forests by species and forest type, Wyoming, 1984

Species	Forest type					All types
	Douglas-fir	Ponderosa pine	Lodgepole pine	Spruce-fir	Hardwoods	
	Thousand cubic feet					
Douglas-fir	201,266.8	10,202.4	1,272.3	70,721.7	3,728.1	287,191.3
Ponderosa pine	--	881,756.3	2,248.1	9,373.8	4,967.5	898,345.7
Lodgepole pine	5,843.9	--	349,738.8	44,815.9	13,831.4	414,230.0
Limber pine	15,676.7	3,030.6	6,407.1	129,186.1	418.3	154,718.8
Whitebark pine	--	--	--	--	--	--
True fir	2,598.6	--	13,024.4	132,058.1	8,127.9	155,809.0
Spruce	13,250.6	--	1,050.9	126,325.2	5,812.8	146,439.5
Total softwoods	238,636.6	894,989.3	373,741.6	512,480.8	36,886.0	2,056,734.3
Aspen	4,738.2	1,823.8	5,937.3	38,813.1	163,219.0	214,531.4
Cottonwood	--	--	--	--	51,319.0	51,319.0
Total hardwoods	4,738.2	1,823.8	5,937.3	38,813.1	214,538.0	265,850.4
All species	243,374.8	896,813.1	379,678.9	551,293.9	251,424.0	2,322,584.7

Table 53--Net volume of sawtimber on timberland outside National Forests by species and forest type, Wyoming, 1984

Species	Forest type					All types
	Douglas-fir	Ponderosa pine	Lodgepole pine	Spruce-fir	Hardwoods	
	Thousand board feet, International ¼-inch rule					
Douglas-fir	729,463.2	31,474.1	3,497.4	338,023.7	16,696.5	1,119,154.9
Ponderosa pine	--	3,333,755.8	10,210.8	47,274.8	15,558.8	3,406,800.2
Lodgepole pine	15,753.5	--	835,551.3	163,306.6	57,807.2	1,072,418.6
Limber pine	43,730.7	2,035.6	20,473.4	340,259.8	1,733.8	408,233.3
Whitebark pine	--	--	--	--	--	--
True fir	10,223.5	--	30,614.0	402,241.4	13,335.1	456,414.0
Spruce	38,538.5	--	5,667.0	543,150.3	26,213.0	613,568.8
Total softwoods	837,709.4	3,367,265.5	906,013.9	1,834,256.6	131,344.4	7,076,589.8
Aspen	--	--	--	36,471.2	182,388.4	218,859.6
Cottonwood	--	--	--	--	206,831.8	206,831.8
Total hardwoods	--	--	--	36,471.2	389,220.2	425,691.4
All species	837,709.4	3,367,265.5	906,013.9	1,870,727.8	520,564.6	7,502,281.2
	Thousand board feet, Scribner rule					
Douglas-fir	619,873.9	27,233.8	2,875.7	292,397.8	13,920.0	956,301.2
Ponderosa pine	--	2,794,089.2	8,631.1	41,064.4	13,194.5	2,856,979.2
Lodgepole pine	13,447.0	--	714,414.1	138,297.0	49,371.4	915,529.5
Limber pine	36,386.2	1,811.7	17,300.6	285,259.1	1,478.6	342,236.2
Whitebark pine	--	--	--	--	--	--
True fir	8,467.2	--	26,386.0	341,569.8	11,772.8	388,195.8
Spruce	33,362.8	--	4,847.9	457,053.2	22,402.7	517,666.6
Total softwoods	711,537.1	2,823,134.7	774,455.4	1,555,641.3	112,140.0	5,976,908.5
Aspen	--	--	--	31,126.9	155,488.3	186,615.2
Cottonwood	--	--	--	--	178,388.1	178,388.1
Total hardwoods	--	--	--	31,126.9	333,876.4	365,003.3
All species	711,537.1	2,823,134.7	774,455.4	1,586,768.2	446,016.4	6,341,911.8

Table 54--Net volume of woodland species outside National Forests by ownership class, forest type, and productivity class, Wyoming, 1984

Ownership class	Forest type	Productivity class		All classes
		High	Low	
		Thousand cubic feet		
Other public:	Pinyon-juniper	3,975	--	3,975
	Juniper	69,353	41,561	110,914
	Oak	3,802	--	3,802
	Other	541	555	1,096
	Total	77,671	42,116	119,787
Private:	Pinyon-juniper	--	--	--
	Juniper	58,506	15,416	73,922
	Oak	11,121	--	11,121
	Other	53,766	8,474	62,240
	Total	123,393	23,890	147,283
Total:	Pinyon-juniper	3,975	--	3,975
	Juniper	127,859	56,977	184,836
	Oak	14,923	--	14,923
	Other	54,307	9,029	63,336
	Total	201,064	66,006	267,070

Table 55--Net volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class, Wyoming, 1984

Ownership class	Forest type	Volume class			All classes
		0 - 500 cu ft/acre	500-1,000 cu ft/acre	1,000+ cu ft/acre	
		Thousand cubic feet			
Other public:	Pinyon-juniper	3,975	--	--	3,975
	Juniper	61,190	49,724	--	110,914
	Oak	--	3,802	--	3,802
	Other	1,096	--	--	1,096
	Total	66,261	53,526	--	119,787
Private:	Pinyon-juniper	--	--	--	--
	Juniper	37,110	31,244	5,568	73,922
	Oak	1,074	4,145	5,902	11,121
	Other	1,711	6,763	53,766	62,240
	Total	39,895	42,152	65,236	147,283
Total:	Pinyon-juniper	3,975	--	--	3,975
	Juniper	98,300	80,968	5,568	184,836
	Oak	1,074	7,947	5,902	14,923
	Other	2,807	6,763	53,766	63,336
	Total	106,156	95,678	65,236	267,070

Table 56--Net volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class, Wyoming, 1984

Ownership class and species	Diameter class (inches at root collar)														
	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+	All classes
	Thousand cubic feet														
Other public:															
Pinyon	--	137	604	717	--	--	--	--	--	--	--	--	--	--	1,458
Juniper	2,175	4,383	6,848	7,922	10,240	8,825	15,182	10,924	9,559	7,320	12,552	7,718	571	9,230	113,449
Oak	45	187	484	--	1,662	1,335	--	--	--	--	--	--	--	--	3,713
Mtn. mahogany	166	130	235	155	236	156	--	--	--	--	--	--	--	--	1,078
Other	13	76	--	--	--	--	--	--	--	--	--	--	--	--	89
Total	2,399	4,913	8,171	8,794	12,138	10,316	15,182	10,924	9,559	7,320	12,552	7,718	571	9,230	119,787
Private:															
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	1,176	3,118	4,331	6,326	3,790	5,599	3,724	9,090	9,122	4,255	5,676	6,229	--	12,119	74,555
Oak	1,073	2,574	2,424	1,232	1,214	2,095	--	--	--	--	--	--	--	--	10,612
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	1,053	1,657	3,934	3,299	16,181	6,398	987	2,320	4,945	6,183	--	--	--	15,159	62,116
Total	3,302	7,349	10,689	10,857	21,185	14,092	4,711	11,410	14,067	10,438	5,676	6,229	--	27,278	147,283
Total:															
Pinyon	--	137	604	717	--	--	--	--	--	--	--	--	--	--	1,458
Juniper	3,351	7,501	11,179	14,248	14,030	14,424	18,906	20,014	18,681	11,575	18,228	13,947	571	21,349	188,004
Oak	1,118	2,761	2,908	1,232	2,876	3,430	--	--	--	--	--	--	--	--	14,325
Mtn. mahogany	166	130	235	155	236	156	--	--	--	--	--	--	--	--	1,078
Other	1,066	1,733	3,934	3,299	16,181	6,398	987	2,320	4,945	6,183	--	--	--	15,159	62,205
Total	5,701	12,262	18,860	19,651	33,323	24,408	19,893	22,334	23,626	17,758	18,228	13,947	571	36,508	267,070

Table 57--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class, Wyoming, 1984

Ownership class	Forest type	Productivity class		All classes
		High	Low	
		Thousand cubic feet		
Other public:	Pinyon-juniper	1,094	--	1,094
	Juniper	11,942	10,744	22,686
	Oak	30	--	30
	Other	59	177	236
	Total	13,125	10,921	24,046
Private:				
	Pinyon-juniper	--	--	--
	Juniper	7,459	1,147	8,606
	Oak	1,628	--	1,628
	Other	11,830	671	12,501
	Total	20,917	1,818	22,735
Total:				
	Pinyon-juniper	1,094	--	1,094
	Juniper	19,401	11,891	31,292
	Oak	1,658	--	1,658
	Other	11,889	848	12,737
	Total	34,042	12,739	46,781

Table 58--Net dead volume of woodland species on woodland outside National Forests by ownership class, forest type, and volume class, Wyoming, 1984

Ownership class	Forest type	Volume class			All classes
		0 - 500 ft³/acre	500 - 1,000 ft³/acre	1,000+ ft³/acre	
		Thousand cubic feet			
Other public:	Pinyon-juniper	1,094	--	--	1,094
	Juniper	9,529	13,157	--	22,686
	Oak	--	30	--	30
	Other	236	--	--	236
	Total	10,859	13,187	--	24,046
Private:	Pinyon-juniper	--	--	--	--
	Juniper	5,524	2,653	429	8,606
	Oak	--	--	1,628	1,628
	Other	249	422	11,830	12,501
	Total	5,773	3,075	13,887	22,735
Total:	Pinyon-juniper	1,094	--	--	1,094
	Juniper	15,053	15,810	429	31,292
	Oak	--	30	1,628	1,658
	Other	485	422	11,830	12,737
	Total	16,632	16,262	13,887	46,781

Table 59--Net dead volume of woodland species on woodland outside National Forests by ownership class, species, and diameter class, Wyoming, 1984

Ownership class and species	Diameter class (inches at root collar)														All classes
	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+	
	Thousand cubic feet														
Other public:															
Pinyon	--	--	48	78	--	--	--	--	--	--	--	--	--	--	126
Juniper	22	91	367	921	729	1,348	2,629	2,342	1,193	1,280	2,155	1,240	2,403	7,098	23,818
Oak	2	--	24	--	--	--	--	--	--	--	--	--	--	--	26
Mtn. mahogany	20	28	--	24	--	--	--	--	--	--	--	--	--	--	72
Other	--	4	--	--	--	--	--	--	--	--	--	--	--	--	4
Total	44	123	439	1,023	729	1,348	2,629	2,342	1,193	1,280	2,155	1,240	2,403	7,098	24,046
Private:															
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	7	121	27	309	993	714	606	500	798	373	244	1,240	--	2,673	8,605
Oak	12	587	1,014	16	--	--	--	--	--	--	--	--	--	--	1,629
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	196	302	646	1,071	--	110	1,901	--	247	7,270	--	--	--	758	12,501
Total	215	1,010	1,687	1,396	993	824	2,507	500	1,045	7,643	244	1,240	--	3,431	22,735
Total:															
Pinyon	--	--	48	78	--	--	--	--	--	--	--	--	--	--	126
Juniper	29	212	394	1,230	1,722	2,062	3,235	2,842	1,991	1,653	2,399	2,480	2,403	9,771	32,423
Oak	14	587	1,038	16	--	--	--	--	--	--	--	--	--	--	1,655
Mtn. mahogany	20	28	--	24	--	--	--	--	--	--	--	--	--	--	72
Other	196	306	646	1,071	--	110	1,901	--	247	7,270	--	--	--	758	12,505
Total	259	1,133	2,126	2,419	1,722	2,172	5,136	2,842	2,238	8,923	2,399	2,480	2,403	10,529	46,781

Table 60--Net annual growth of sawtimber on timberland outside National Forests by species and ownership class, Wyoming, 1983

Species	Ownership class		All classes
	Other public	Private	
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	19,947.3	2,659.2	22,606.5
Ponderosa pine	12,319.6	82,737.5	95,057.1
Lodgepole pine	19,276.8	11,962.1	31,238.9
Limber pine	6,357.0	-3,280.6	3,076.4
Whitebark pine	--	--	--
True fir	12,811.7	3,359.5	16,171.2
Spruce	5,697.4	6,347.4	12,044.8
Total softwoods	76,409.8	103,785.1	180,194.9
Aspen	3,555.7	5,474.3	9,030.0
Cottonwood	--	3,609.1	3,609.1
Total hardwoods	3,555.7	9,083.4	12,639.1
All species	79,965.5	112,868.5	192,834.0
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	17,237.2	2,338.0	19,575.2
Ponderosa pine	10,261.2	68,696.0	78,957.2
Lodgepole pine	16,228.4	10,616.6	26,845.0
Limber pine	4,768.9	-2,697.0	2,071.9
Whitebark pine	--	--	--
True fir	10,918.7	2,767.4	13,686.1
Spruce	4,732.1	5,281.9	10,014.0
Total softwoods	64,146.5	87,002.9	151,149.4
Aspen	3,090.4	4,695.1	7,785.5
Cottonwood	--	3,289.4	3,289.4
Total hardwoods	3,090.4	7,984.5	11,074.9
All species	67,236.9	94,987.4	162,224.3

Table 61--Net annual growth of sawtimber on timberland outside National Forests by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule								
Douglas-fir	14,991.5	3,767.6	2,211.9	1,380.1	941.3	-2,467.5	1,682.5	99.1	22,606.5
Ponderosa pine	41,772.3	18,932.0	15,758.4	8,991.8	3,895.5	2,821.5	2,756.1	129.5	95,057.1
Lodgepole pine	26,684.3	4,651.7	-408.9	-846.0	425.8	619.9	112.1	--	31,238.9
Limber pine	6,232.7	-1,532.2	-1,359.0	593.2	-599.9	50.7	-385.1	76.1	3,076.5
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	10,671.2	1,424.6	2,441.9	825.2	171.5	155.8	481.1	--	16,171.3
Spruce	1,391.2	1,871.9	2,650.7	1,635.7	1,631.4	1,168.1	1,555.8	139.9	12,044.7
Total softwoods	101,743.2	29,115.6	21,295.0	12,580.0	6,465.6	2,348.5	6,202.5	444.6	180,195.0
Aspen	XXXXX	7,559.2	1,122.2	245.2	57.2	46.2	--	--	9,030.0
Cottonwood	XXXXX	372.9	159.9	76.2	173.5	352.3	1,482.3	992.0	3,609.1
Total hardwoods	XXXXX	7,932.1	1,282.1	321.4	230.7	398.5	1,482.3	992.0	12,639.1
All species	101,743.2	37,047.7	22,577.1	12,901.4	6,696.3	2,747.0	7,684.8	1,436.6	192,834.1
	Thousand board feet, Scribner rule								
Douglas-fir	13,399.1	2,989.3	1,741.2	1,085.5	795.7	-2,065.9	1,542.0	88.2	19,575.1
Ponderosa pine	32,671.3	16,721.8	12,885.3	7,737.9	3,678.8	2,622.0	2,524.5	115.5	78,957.1
Lodgepole pine	22,915.9	3,816.1	-342.8	-633.3	403.1	584.5	101.6	--	26,845.1
Limber pine	4,644.3	-1,214.1	-1,159.3	507.3	-496.2	42.1	-320.1	68.0	2,072.0
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	9,382.2	1,080.1	1,853.1	646.6	134.8	122.6	466.8	--	13,686.2
Spruce	1,239.6	1,469.5	2,082.0	1,285.6	1,304.9	1,106.8	1,401.1	124.5	10,014.0
Total softwoods	84,252.4	24,862.7	17,059.5	10,629.6	5,821.1	2,412.1	5,715.9	396.2	151,149.5
Aspen	XXXXX	6,523.6	958.2	213.6	49.9	40.2	--	--	7,785.5
Cottonwood	XXXXX	344.0	184.7	71.8	159.9	324.2	1,321.8	882.9	3,289.3
Total hardwoods	XXXXX	6,867.6	1,142.9	285.4	209.8	364.4	1,321.8	882.9	11,074.8
All species	84,252.4	31,730.3	18,202.4	10,915.0	6,030.9	2,776.5	7,037.7	1,279.1	162,224.3

Table 62--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and productivity class, Wyoming, 1983

Ownership class	Forest type	Productivity class		All classes
		High	Low	
		Thousand cubic feet		
Other public:	Pinyon-juniper	64	--	64
	Juniper	781	383	1,164
	Oak	95	--	95
	Other	14	4	18
	Total	954	387	1,341
Private:	Pinyon-juniper	--	--	--
	Juniper	295	213	508
	Oak	193	--	193
	Other	1,008	234	1,242
	Total	1,496	447	1,943
Total:	Pinyon-juniper	64	--	64
	Juniper	1,076	596	1,672
	Oak	288	--	288
	Other	1,022	238	1,260
	Total	2,450	834	3,284

Table 63--Net annual growth of woodland species on woodland outside National Forests by ownership class, forest type, and volume class, Wyoming, 1983

Ownership class	Forest type	Volume class			All classes
		0 - 500 ft³/acre	500 - 1,000 ft³/acre	1,000+ ft³/acre	
		Thousand cubic feet			
Other public:	Pinyon-juniper	64	--	--	64
	Juniper	675	489	--	1,164
	Oak	--	95	--	95
	Other	18	--	--	18
	Total	757	584	--	1,341
Private:	Pinyon-juniper	--	--	--	--
	Juniper	299	193	16	508
	Oak	26	29	138	193
	Other	92	142	1,008	1,242
	Total	417	364	1,162	1,943
Total:	Pinyon-juniper	64	--	--	64
	Juniper	974	682	16	1,672
	Oak	26	124	138	288
	Other	110	142	1,008	1,260
	Total	1,174	948	1,162	3,284

Table 64--Net annual growth of woodland species on woodland outside National Forests by ownership class, species, and diameter class, Wyoming, 1983

Ownership class and species	Diameter class (inches at root collar)														
	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+	All classes
	Thousand cubic feet														
Other public:															
Pinyon	--	7	16	19	--	--	--	--	--	--	--	--	--	--	42
Juniper	128	137	135	105	133	101	129	77	74	36	68	37	2	23	1,185
Oak	2	5	11	--	38	23	--	--	--	--	--	--	--	--	79
Mtn. mahogany	6	2	3	3	4	1	--	--	--	--	--	--	--	--	19
Other	13	3	--	--	--	--	--	--	--	--	--	--	--	--	16
Total	149	154	165	127	175	125	129	77	74	36	68	37	2	23	1,341
Private:															
Pinyon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Juniper	69	51	97	70	-36	42	27	52	46	18	26	25	--	25	512
Oak	30	65	50	10	12	9	--	--	--	--	--	--	--	--	176
Mtn. mahogany	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	76	63	196	183	368	156	20	39	37	41	--	--	--	76	1,255
Total	175	179	343	263	344	207	47	91	83	59	26	25	--	101	1,943
Total:															
Pinyon	--	7	16	19	--	--	--	--	--	--	--	--	--	--	42
Juniper	197	188	232	175	97	143	156	129	120	54	94	62	2	48	1,697
Oak	32	70	61	10	50	32	--	--	--	--	--	--	--	--	255
Mtn. mahogany	6	2	3	3	4	1	--	--	--	--	--	--	--	--	19
Other	89	66	196	183	368	156	20	39	37	41	--	--	--	76	1,271
Total	324	333	508	390	519	332	176	168	157	95	94	62	2	124	3,284

Table 65--Annual mortality of sawtimber on timberland outside National Forests by species and ownership class, Wyoming, 1983

Species	Ownership class		
	Other public	Private	All classes
	- - Thousand board feet, International ¼-inch rule - -		
Douglas-fir	--	3,058.9	3,058.9
Ponderosa pine	2,185.8	6,838.3	9,024.1
Lodgepole pine	2,587.8	5,785.2	8,373.0
Limber pine	1,214.5	7,380.6	8,595.1
Whitebark pine	--	--	--
True fir	2,433.8	--	2,433.8
Spruce	--	--	--
Total softwoods	8,421.9	23,063.0	31,484.9
Aspen	925.7	1,591.8	2,517.5
Cottonwood	--	218.6	218.6
Total hardwoods	925.7	1,810.4	2,736.1
All species	9,347.6	24,873.4	34,221.0
	- - - - - Thousand board feet, Scribner rule - - - - -		
Douglas-fir	--	2,607.9	2,607.9
Ponderosa pine	1,847.6	5,702.7	7,550.3
Lodgepole pine	2,179.4	4,909.6	7,089.0
Limber pine	1,043.3	6,224.5	7,267.8
Whitebark pine	--	--	--
True fir	2,109.2	--	2,109.2
Spruce	--	--	--
Total softwoods	7,179.5	19,444.7	26,624.2
Aspen	795.7	1,370.8	2,166.5
Cottonwood	--	167.5	167.5
Total hardwoods	795.7	1,538.3	2,334.0
All species	7,975.2	20,983.0	28,958.2

Table 66--Annual mortality of sawtimber on timberland outside National Forests by species and diameter class, Wyoming, 1983

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	21.0-28.9	29.0+	All classes
	Thousand board feet, International ¼-inch rule								
Douglas-fir	--	--	--	--	--	3,058.9	--	--	3,058.9
Ponderosa pine	1,409.7	1,491.8	1,742.9	1,516.6	2,863.1	--	--	--	9,024.1
Lodgepole pine	2,026.9	2,177.6	2,266.7	1,901.8	--	--	--	--	8,373.0
Limber pine	1,038.4	3,738.9	2,435.7	--	952.5	--	429.6	--	8,595.1
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	529.9	855.0	1,048.9	--	--	--	--	--	2,433.8
Spruce	--	--	--	--	--	--	--	--	--
Total softwoods	5,004.9	8,263.3	7,494.2	3,418.4	3,815.6	3,058.9	429.6	--	31,484.9
Aspen	XXXXX	2,517.5	--	--	--	--	--	--	2,517.5
Cottonwood	XXXXX	--	218.6	--	--	--	--	--	218.6
Total hardwoods	XXXXX	2,517.5	218.6	--	--	--	--	--	2,736.1
All species	5,004.9	10,780.8	7,712.8	3,418.4	3,815.6	3,058.9	429.6	--	34,221.0
	Thousand board feet, Scribner rule								
Douglas-fir	--	--	--	--	--	2,607.9	--	--	2,607.9
Ponderosa pine	1,070.9	1,225.0	1,497.7	1,257.9	2,498.8	--	--	--	7,550.3
Lodgepole pine	1,730.7	1,848.0	1,914.4	1,595.9	--	--	--	--	7,089.0
Limber pine	854.3	3,201.9	2,051.2	--	799.9	--	360.5	--	7,267.8
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	471.6	752.4	885.2	--	--	--	--	--	2,109.2
Spruce	--	--	--	--	--	--	--	--	--
Total softwoods	4,127.5	7,027.3	6,348.5	2,853.8	3,298.7	2,607.9	360.5	--	26,624.2
Aspen	XXXXX	2,166.5	--	--	--	--	--	--	2,166.5
Cottonwood	XXXXX	--	167.5	--	--	--	--	--	167.5
Total hardwoods	XXXXX	2,166.5	167.5	--	--	--	--	--	2,334.0
All species	4,127.5	9,193.8	6,516.0	2,853.8	3,298.7	2,607.9	360.5	--	28,958.2

Table 67--Annual mortality of sawtimber (International ¼-inch rule) on timberland outside National Forests by species and cause of death, Wyoming, 1983

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, International ¼-inch rule								
Douglas-fir	--	--	--	--	3,058.9	--	--	--	3,058.9
Ponderosa pine	3,638.3	2,061.5	2,482.8	--	841.5	--	--	--	9,024.1
Lodgepole pine	5,101.7	2,587.8	--	--	--	--	--	683.5	8,373.0
Limber pine	--	7,353.3	--	--	1,241.8	--	--	--	8,595.1
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	1,903.9	--	--	--	--	--	--	529.9	2,433.8
Spruce	--	--	--	--	--	--	--	--	--
Total softwoods	10,643.9	12,002.6	2,482.8	--	5,142.2	--	--	1,213.4	31,484.9
Aspen	--	1,591.8	--	925.7	--	--	--	--	2,517.5
Cottonwood	--	--	--	218.6	--	--	--	--	218.6
Total hardwoods	--	1,591.8	--	1,144.3	--	--	--	--	2,736.1
All species	10,643.9	13,594.4	2,482.8	1,144.3	5,142.2	--	--	1,213.4	34,221.0

Table 68--Annual mortality of sawtimber (Scribner rule) on timberland outside National Forests by species and cause of death, Wyoming, 1983

Species	Cause of death								
	Insects	Disease	Fire	Animal	Weather	Suppression	Logging	Unknown	Total
	Thousand board feet, Scribner rule								
Douglas-fir	--	--	--	--	2,607.9	--	--	--	2,607.9
Ponderosa pine	2,962.2	1,752.6	2,105.5	--	730.0	--	--	--	7,550.3
Lodgepole pine	4,336.8	2,179.4	--	--	--	--	--	572.9	7,089.1
Limber pine	--	6,211.3	--	--	1,056.5	--	--	--	7,267.8
Whitebark pine	--	--	--	--	--	--	--	--	--
True fir	1,637.5	--	--	--	--	--	--	471.7	2,109.2
Spruce	--	--	--	--	--	--	--	--	--
Total softwoods	8,936.5	10,143.3	2,105.5	--	4,394.4	--	--	1,044.6	26,624.3
Aspen	--	1,370.8	--	795.7	--	--	--	--	2,166.5
Cottonwood	--	--	--	167.5	--	--	--	--	167.5
Total hardwoods	--	1,370.8	--	963.2	--	--	--	--	2,334.0
All species	8,936.5	11,514.1	2,105.5	963.2	4,394.4	--	--	1,044.6	28,958.3

Table 69--Number of fenceposts on woodland outside National Forests by ownership class, species, and type of post, Wyoming, 1984

Ownership class	Species	Type of post		Total
		Line	Corner	
		Thousand fenceposts		
Other public:	Juniper	14,136	5,758	19,894
	Oak	134	658	792
	Total	14,270	6,416	20,686
Private:	Juniper	13,287	5,879	19,166
	Oak	10,520	4,406	14,926
	Total	23,807	10,285	34,092
Total:	Juniper	27,423	11,637	39,060
	Oak	10,654	5,064	15,718
	Total	38,077	16,701	54,778

Table 70--Number of pinyon Christmas trees on woodland outside National Forests by ownership class, grade, and height class, Wyoming, 1984

Ownership class	Christmas-tree grade	Height class			All classes
		0 - 5 ft	6 - 10 ft	11 - 12 ft	
		Thousand trees			
Other public:	Premium	--	--	--	--
	Standard	--	--	131	131
	Utility	--	--	--	--
	Total	--	--	131	131
Private:	Premium	--	--	--	--
	Standard	--	--	--	--
	Utility	--	--	--	--
	Total	--	--	--	--
Total:	Premium	--	--	--	--
	Standard	--	--	131	131
	Utility	--	--	--	--
	Total	--	--	131	131

Table 71--Area of forest land outside National Forests with percent standard error, Wyoming, 1984

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Timberland	2,097,090	±3.2	293,588	±14.4	2,390,678	±2.6
Woodland	704,037	±10.4	72,436	±32.1	776,473	±9.7
Reserved forest land:[1]						
Timberland	1,832,997		6,060		1,839,057	
Woodland	3,691		--		3,691	
Total forest land	4,637,815		372,084		5,009,899	

[1]Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 72--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on timberland outside National Forests with percent standard error, Wyoming

Item	Softwoods		Hardwoods		All species	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume, 1984:						
Growing stock (M cubic feet)	2,056,734	±6.9	265,851	±18.0	2,322,585	±6.4
Sawtimber[1] (M board feet)	7,076,590	±8.1	425,691	±25.4	7,502,281	±7.7
Sawtimber[2] (M board feet)	5,976,909	±8.2	365,003	±25.7	6,341,912	±7.8
Net annual growth, 1983:						
Growing stock (M cubic feet)	41,012	±9.6	4,545	±29.5	45,557	±9.1
Sawtimber[1] (M board feet)	180,195	±11.5	12,639	±51.7	192,834	±11.3
Sawtimber[2] (M board feet)	151,149	±11.5	11,075	±51.3	162,224	±11.2
Annual mortality, 1983:						
Growing stock (M cubic feet)	9,121	±26.2	2,439	±41.3	11,560	±22.7
Sawtimber[1] (M board feet)	31,485	±32.5	2,736	±67.6	34,221	±30.4
Sawtimber[2] (M board feet)	26,624	±32.6	2,334	±68.1	28,958	±30.4

[1]International ¼-inch rule.
[2]Scribner rule.

APPENDIX IV: MAJOR FOREST TREE SPECIES IN WYOMING

Conifers

Subalpine fir	*Abies lasiocarpa* (Hook.) Nutt.
Utah juniper	*Juniperus osteosperma* (Torr.) Little
Rocky Mountain juniper	*J. scopulorum* Sarg.
Engelmann spruce	*Picea engelmannii* Parry
White spruce	*P. glauca* (Moench) Voss
Blue spruce	*P. pungens* Engelm.
Whitebark pine	*Pinus albicaulis* Engelm.
Lodgepole pine	*P. contorta* Dougl.
Pinyon	*P. edulis* Engelm.
Limber pine	*P. flexilis* James
Ponderosa pine	*P. ponderosa* Laws
Douglas-fir	*Pseudotsuga menziesii* (Mirb.) Franco

Hardwoods

Boxelder	*Acer negundo* L.
Alder	*Alnus* sp.
Paper birch	*Betula papyrifera* Marsh.
Hackberry	*Celtis occidentalis* L.
Green ash	*Fraxinus pennsylvanica* Marsh.
Narrowleaf cottonwood	*Polulus angustifolia* James
Balsam poplar	*P. balsamifera* L.
Eastern cottonwood	*P. deltoides* Bartr.
Plains cottonwood	*P. deltoides* var. *occidentalis* Rydb.
Black cottonwood	*P. trichocarpa* Torr. and Gray
Quaking aspen	*P. tremuloides* Michx.
Gambel oak	*Quercus gambelii* Nutt.
Bur oak	*Q. macrocarpa* Michx.
Peachleaf willow	*Salix amygdaloides* Anderss.

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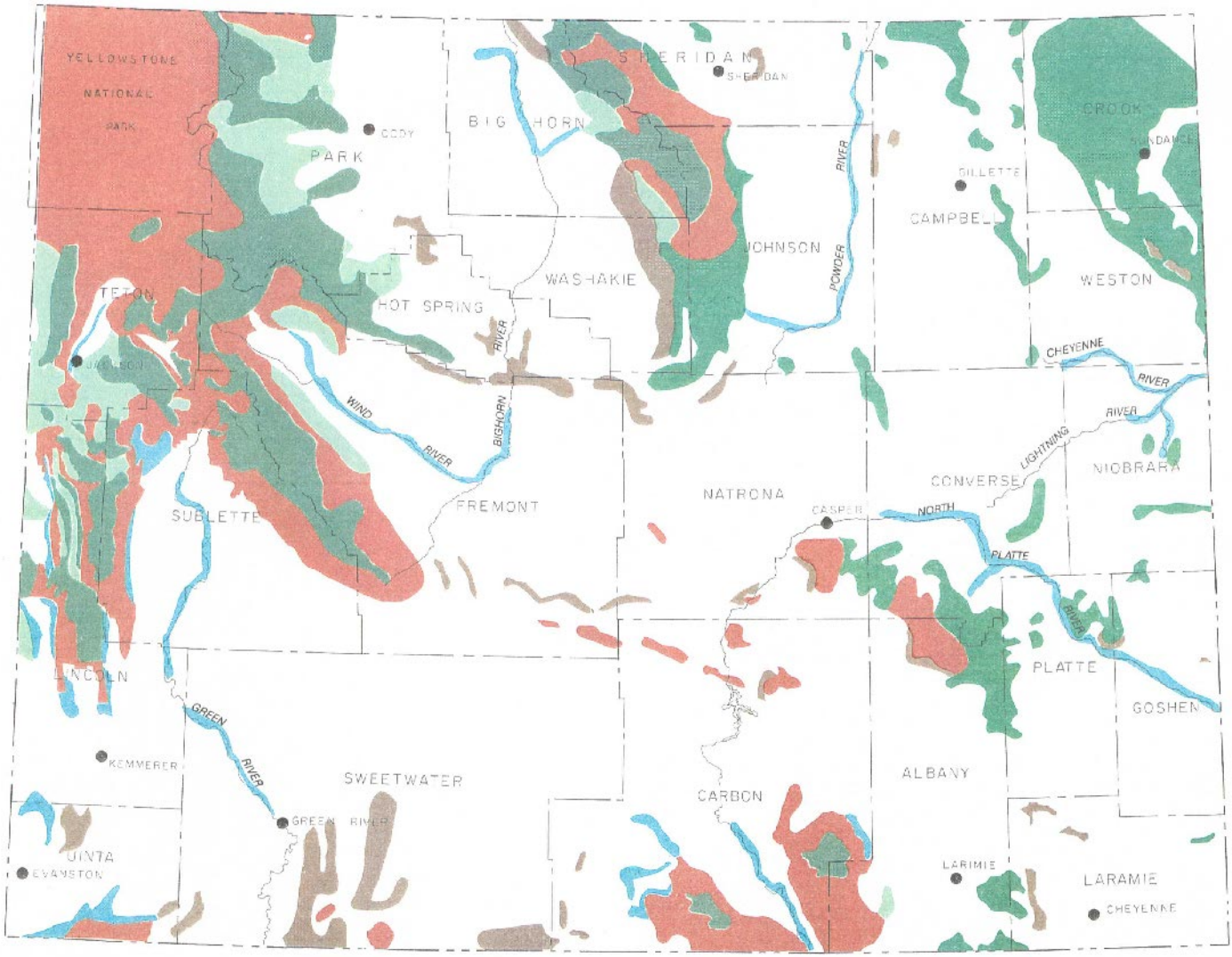

MAJOR FOREST TYPES

WYOMING

1987

FOREST SURVEY—INTERMOUNTAIN RESEARCH STATION

U.S. DEPARTMENT OF AGRICULTURE—FOREST SERVICE

SCALE

20 10 0 20 40 Miles

LEGEND

- LODGEPOLE PINE
- FIR-SPRUCE
- DOUGLAS-FIR
- HARDWOODS
- PONDEROSA PINE
- JUNIPER

INTERMOUNTAIN RESEARCH STATION

The Intermountain Research Station provides scientific knowledge and technology to improve management, protection, and use of the forests and rangelands of the Intermountain West. Research is designed to meet the needs of National Forest managers, Federal and State agencies, industry, academic institutions, public and private organizations, and individuals. Results of research are made available through publications, symposia, workshops, training sessions, and personal contacts.

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Moscow, Idaho (in cooperation with the University of Idaho)

Ogden, Utah

Provo, Utah (in cooperation with Brigham Young University)

Reno, Nevada (in cooperation with the University of Nevada)

Green, Alan W.; Conner, Roger C. 1989. Forests in Wyoming. Resour. Bull. INT-61. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 91 p.

Presents highlights of Wyoming's forest resources as of 1984. Describes the extent, nature, condition, and location of forest resources and discusses levels of some nontimber use of forest land. Includes statistical tables: area by land classes, ownership, wood volumes, growth, mortality, and products removals.

KEYWORDS: timberland, woodland, timber mortality, timber removals, nontimber values