

2670
A



88046007

PROPERTY OF
Bureau of Land Management
D S C LIBRARY

PROJECT TWENTY-TWELVE

UNITED STATES DEPARTMENT OF THE INTERIOR

Fred A. Seaton, *Secretary*

BUREAU OF LAND MANAGEMENT

Edward Woolley, *Director*

1960



QH
76-5
.U5
P765
1961
v.1

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

975 91 007

04
76.5
11.5
P765
1961
V.1

PROJECT TWENTY-TWELVE

A Long Range Program for Our Public Lands



BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

UNITED STATES DEPARTMENT OF THE INTERIOR

Fred A. Seaton, *Secretary*

BUREAU OF LAND MANAGEMENT

Edward Woozley, *Director*

1960

PROPERTY OF U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DENVER, COLORADO



UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

AUGUST 27, 1960

Dear Mr. President:

With this letter we are transmitting to you a copy of the report entitled "Project Twenty-Twelve," which is a program for the Bureau of Land Management until the year 2012. It is our belief that this report represents a reasonable projection of the future needs for the long range management of the public lands under the jurisdiction of the Bureau of Land Management. It does not preclude future revisions of the plan due to unforeseen demands and other factors. This report realistically forecasts the needs in public land management and presents a plan to meet these needs.

The need for a strong Federal program in the field of resource development has been well emphasized by President Eisenhower in his messages to the Congress. The projected program for the Bureau of Land Management is in keeping with the needs as expressed by the President. This comprehensive plan adequately treats the basic problem of meeting the accepted goals of conservation, improvement, wise use and development of our public lands and will greatly contribute toward meeting the challenge of our growing population and expanding economy.

The Bureau of Land Management has, during the past seven years, developed a sound system of programming that has served to identify and measure the needs and objectives for a dynamic program of public land management. The plan as submitted is an extension of these objectives as developed by the Bureau. We believe a firm foundation for future public land management will be established by this report.

New legislative programs that may be needed in the future will be proposed in the form of supplemental legislation as the need arises. There are, as you know, many measures pending before the current session of the Congress which we have proposed to improve public land management. Foremost of these is S. 1905 and H.R. 7042 which we have previously described as the most significant piece of land

legislation since the Taylor Grazing Act. Its enactment is vital to the continued health and stability of most, if not all, of our western communities.

Other important proposals we have submitted are:

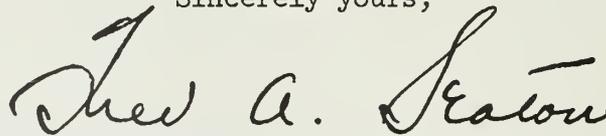
H.R. 3965 - S. 852	To prevent undesirable division of oil and gas leaseholds.
H.R. 6290	Amendment of Townsite Laws (no bill introduced in Senate).
H.R. - 9723 - S. 2859	Land locator bill.
S. 3468	To change law governing sale of isolated and disconnected tracts. (not introduced in House).
S. 3743	To repeal Pittman Act and to require desert land entrymen to be residents of Nevada. (not introduced in House).

We will submit further legislation to the Congress as it becomes necessary. The current pending legislation, including H.R. 7042, appears to be adequate at present.

Appropriation requests to implement this program will be submitted to the Congress in future years in connection with budget presentations after due consideration of the overall fiscal needs and resources of the Federal Government.

A similar letter is being sent to the Speaker of the House.

Sincerely yours,



Secretary of the Interior

Hon. Richard M. Nixon
President of the Senate
Washington 25, D. C.

Contents

	<i>Page</i>
PROJECT TWENTY-TWELVE IN BRIEF	1
Chapter 1—The History and Heritage of Our Public Lands . .	5
Chapter 2—The Half Century Ahead, 1961–2012	13
Chapter 3—The Public Domain in 1960	15
Chapter 4—A Program for Our Public Lands	23
Lands	24
Current Problems	25
Program Goals	26
Program Schedules	27
Minerals	29
Mineral Adjudication	32
Mineral Classification and Investigation	32
Range Management	34
Grazing Administration	34
Soil and Moisture Conservation	39
Weed Control	40
Range Improvements	40
Forest Management	41
Timber Harvests	41
Reforestation	45
Resource Protection	46
Trespass Control	46
Fire Control	46
Protection From Other Damage	48
Access	50
Road Construction and Maintenance	51
Construction and Maintenance of Buildings and Other Facilities	52
Recreation	53
Cadastral Engineering	59
New Surveying Techniques	59
Protraction Diagrams	60
Outer Continental Shelf Surveys	61
Program Requirements	61
General Direction	63

Project Twenty-Twelve in Brief

PROJECT TWENTY-TWELVE is a program for the American people, and for the more than 477 million acres of public domain lands that are their wealth and their heritage.

PROJECT TWENTY-TWELVE is a program of action to help meet the present and future needs of the United States. The program looks ahead to the year 2012—52 short years away—when the Bureau of Land Management will mark its 200th anniversary. It is a realistic program, from which both tangible and intangible benefits will flow in amounts many times the investment necessary.

PROJECT TWENTY-TWELVE will provide systematic, balanced, and coordinated development and use of the public lands and resources—minerals, timber, forage, wildlife, water, and recreation. It shows what should be done, and how it should be undertaken, and the investment required for the needed actions. The benefits which can reasonably be expected from the program are also included.

The increase in benefits to the users of the public lands resulting from the stepped-up program of intensive management and development should in turn compensate the Federal Treasury through increased revenues to be collected.

Under the **PROJECT TWENTY-TWELVE** plan total revenues from Our Public Lands between now and the year 2012 would exceed \$20 billion. Total investment during the same period will amount to \$4.1 billion.

Our Public Lands, acquired by the Federal Government through cessions from the Original Thirteen States and purchases, once totaled some 1.8 billion acres. They have had a significant historic role in the economic development of the Nation.

Under the General Land Office, created in 1812 to administer the public lands, 29 new States were carved from this heritage of the American people. The State of Alaska followed this pattern in 1959. Most of the national parks and monuments, the majority of the national forests, and many other Federal reservations were likewise once part of the public domain. Vast areas were granted to States for internal improvements and projects and other purposes. Other lands were made available for homesteads, to promote development of transportation and communication facilities, and to promote exploration and development of the West.

The public lands, under the exclusive jurisdiction of the Bureau of Land Management since 1946, total about 477 million acres in 28 States.

Lands

The unreserved public domain will be placed in ownerships which will facilitate its best use, thereby maximizing the total public benefit. This will include both stabilization of certain lands in Federal ownership and transfer of appropriate lands to non-Federal ownership.

A continuous review of existing public land ownership or tenure arrangements will be made so that changes can be made when considerations of national economic and social needs indicate the desirability of such changes.

Land classification and tenure adjustment operations will be conducted on an efficient, controlled, and principally Bureau sponsored basis. Public agencies will be encouraged to continue indicating their needs for public lands for public purposes.

All lands activity will be conducted on a current basis, and backlogs will be eliminated by 1965. The land tenure adjustment now considered necessary will be essentially completed on a selective and priority basis by 1980, except in Alaska where land grants are expected to be completed by 1985.

Minerals

The lands on which BLM administers the mineral resources are a vast storehouse of minerals for future generations. It is anticipated that acreage under mineral leases and permits will increase from 105 million acres to 270 million acres by the year 2012. Receipts will rise from \$96 million in 1961 to approximately \$358 million in 2012. A public land mineral resource inventory by BLM will insure a wise plan for orderly mineral development.

Range Management

During 1959, 2.3 million cattle and horses, 5.5 million sheep and goats, and 1.3 million big game animals grazed the public lands using a total of 16.2 million animal-unit-months (AUM's) of forage. The objective of the range management, conservation, and improvement program is to increase forage production on the public lands from an estimated 17 million animal-unit-months in 1959 to 29 million animal-unit-months by 1980 and to 46 million animal-unit-months by the year 2012. This will permit an increase in livestock and big game of approximately 300 percent.

These gains will be accomplished by increasing the intensity of scientific range management, strengthening fire control operations, building soil erosion and water control structures and range

improvements, and by controlling rodents, insects, and weeds injurious to the public lands. Detention dams, small reservoirs, springs and wells, 115,000 miles of range fencing, 12.3 million acres of range seeding, and 32.3 million acres of brush control are typical conservation and management projects. The program includes numerous other practices which will contribute toward rehabilitation and increased forage production on the public lands to help meet the needs of an expanding population.

Forestry

Harvests of timber from BLM lands will total 1.2 billion board feet annually by 1965, and will include the full allowable cut which can be marketed on a sustained yield basis. More intensive utilization and forest management practices resulting in larger yields per acre will permit the sale of 1.3 billion board feet annually by 2012, not including Alaska. Receipts from the sale of timber will increase from \$32 million in 1959 to \$60 million in 2012.

Periodic resource inventories and determinations of resource needs will facilitate the continual improvement of coordinated management plans and action programs.

Maintaining the productivity of Bureau forest lands will require the reforestation of 152,000 acres by seeding and planting during the next 5 years. Meanwhile, protection of all resources from trespass, fire, insects, disease, and other forms of damage will require constant vigilance and effort.

Roads

A system of permanent roads to facilitate resource management and public access will be expanded at an annual cost of more than \$8 million during the next two decades. These roads also will be of value in the management of intermingled lands. Granting permits for such use and acquiring right-of-way easements for public use is estimated to require the processing of from 1,000 to 1,500 access cases annually.

The maintenance of 800 miles of roads in 1961 will be expanded to more than 23,000 miles in 2012 at an estimated cost in that year of \$4 million, not including roads that are maintained by timber purchasers and right-of-way permittees.

Recreation

The nationwide demand for outdoor recreation has steadily increased; acceleration of demand for this form of land use is anticipated during the next half century. To help measure this demand on BLM lands, the Bureau, in cooperation with the National Park Service, will complete and maintain the recreational resource inventory. The Bureau will cooperate fully in assisting the National Outdoor Recreation Resources Review Commission in the Commission's study.

The Bureau will also cooperate fully with States, counties, and municipalities, and other appropriate groups in: making suitable recreation land available for ownership transfer; and effecting cooperative access through lands of other ownership to public

lands needed for recreational purposes. BLM will also cooperate in establishing campsites, picnic areas and other recreational developments on appropriate BLM lands with minimal access, clearing, sanitation, cooking, eating, and potable water developments. The costs of such improvements and developments will be equitably shared with States and local groups.

Cadastral Engineering

During the next five years the Bureau will greatly accelerate its cadastral engineering program. Recruitment and training of qualified personnel will be emphasized, and production in terms of acres surveyed will increase from about 2 million acres per year to over 8 million acres per year in 1965.

It is estimated that over 85 percent of the work produced will be resurveys, including special surveys. The accumulated backlog will be reduced, while currently programmed survey needs are being met.

The program from 1965 to 1980 includes a small but steady increase in acres of surveys to be completed annually, reaching a peak of 9.7 million acres in 1980. About four-fifths of this will be in resurveys and special surveys. Special surveys include those where little or no reportable acreage is involved in comparison to the miles of survey and the time required, and also include surveys of lands selected by the State of Alaska. All the remaining backlog of work will be completed by 1980. It is expected that current needs for completion of original surveys and the more time consuming work of resurveys will be so great that the peak annual production reached at this point will probably be maintained for several years.

The period following this peak production of necessary surveys and resurveys will be one indicating a tapering off of activities in this function to a point where the total acreage to be surveyed in 2012 is estimated at some 1.9 million acres. However, the surveys to be accomplished in 2012 will undoubtedly be confined to areas of relatively high value where special survey requirements will be absolutely necessary.

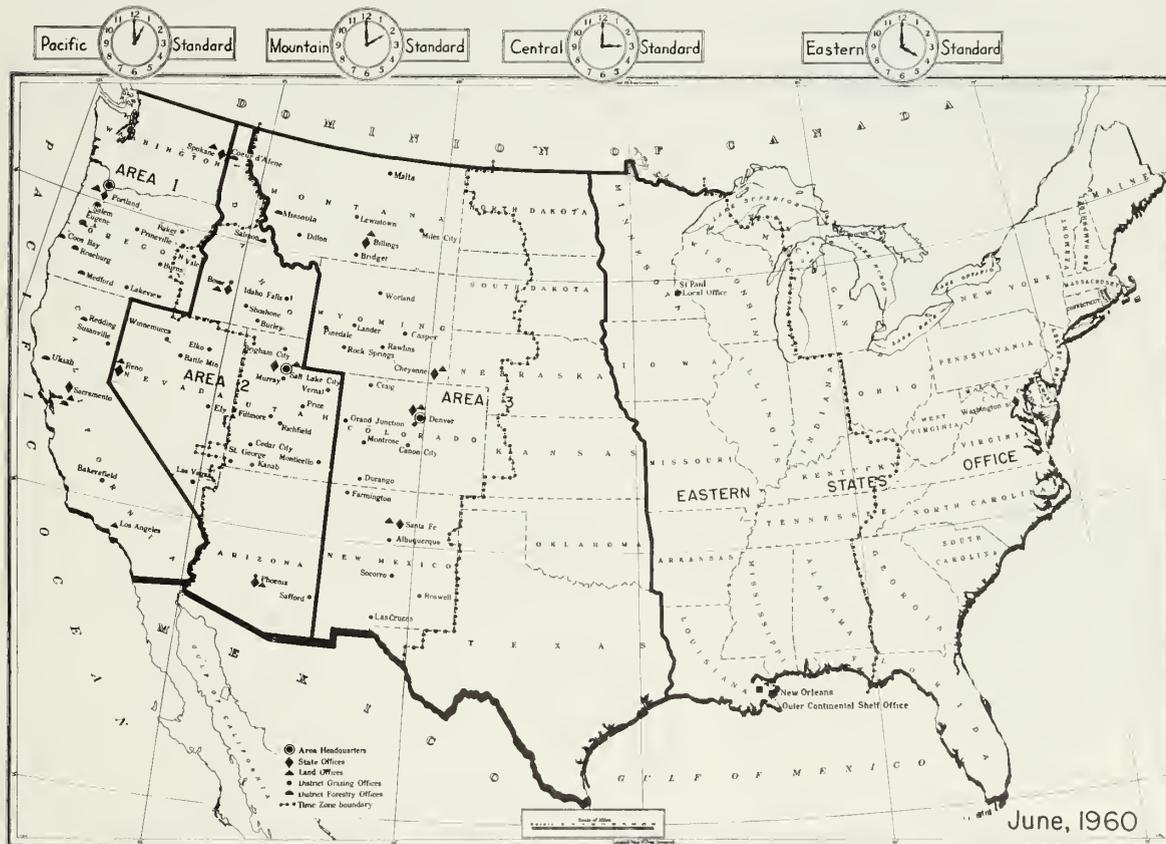
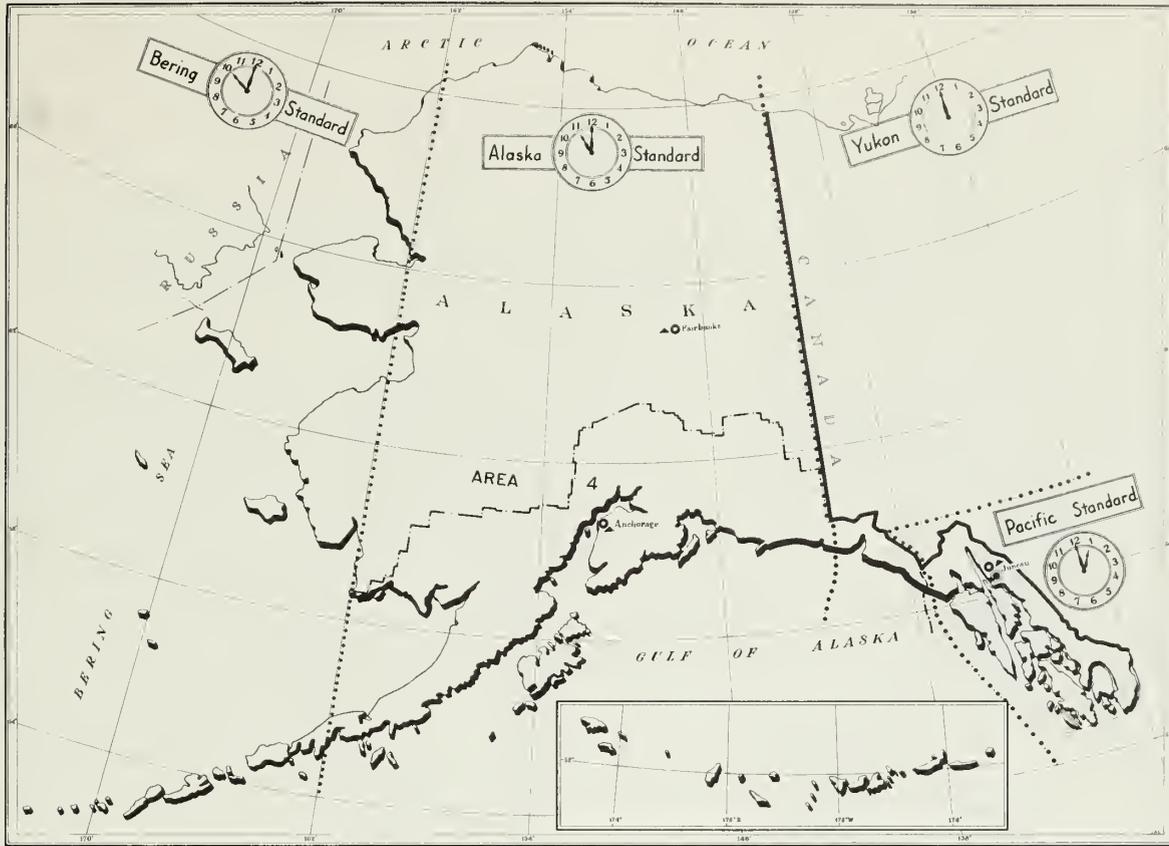
Program Benefits

Under the proposed program the management, protection, and use of the public domain will enable these lands to contribute their full potential to the Nation's economy. Cash receipts will more than double by 1980 and will quadruple by 2012. At the same time the resource base will be improved to an optimum quality through improved management techniques and investment of substantial funds in capital improvements.

In addition, the historic benefit accruing to public domain—that of providing lands and natural resources for use and development in both private and public ownership—will continue.

Provision of all these benefits in a balanced and coordinated manner will help meet total national needs during the dynamic half-century ahead. The public domain will contribute its full share during this period and the great untapped potential of this great resource—as we know it today—will be realized by all of the American people.

UNITED STATES DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT
 AREA AND FIELD OFFICES



CHAPTER 1

The History and Heritage of Our Public Lands

THE MAGNIFICENT symmetry of land patterns seen by countless air travelers as they wing their way across the Great Plains is no accident of history. It is almost unique in the history of the exploration, settlement, and development of the world.

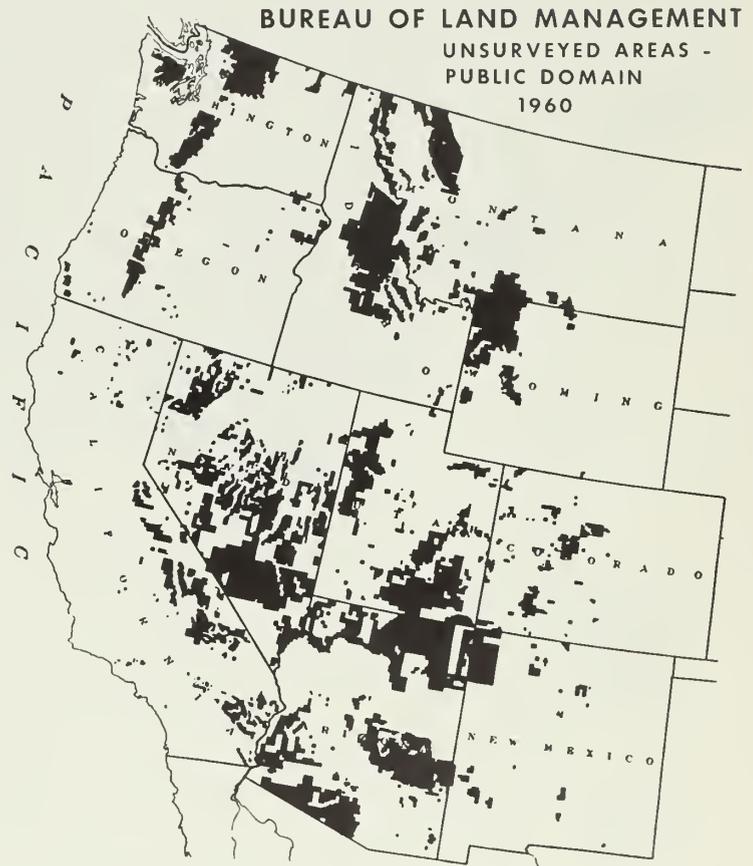
Checkerboard areas of green, gold, and brown and the ribbons of asphalt and gravel byways trailing mile after mile as straight as an arrow, only to turn at abrupt right angles, are the patterns laid down by settlement following the rectangular system of land surveys. The United States was the first country to adopt a national system of land surveys and is today one of only two nations (along with Canada) using a rectangular system.

This system, which has had much to do with the past history of the United States and which has become so much a part of American life and language, is one of the oldest features of the Nation's land policy. It was spelled out by an Ordinance of May 20, 1785, and since has been spread across the States north and west of the Ohio and Mississippi Rivers (except Texas and Hawaii) plus the States of Alabama, Florida, Louisiana, and Mississippi. Over 1.3 billion acres have been surveyed, leaving 475 million acres much of which is desert or mountain areas which may never require survey. These lands, once totaling some 1.8 billion acres, are the Nation's great public domain heritage. The remaining unreserved areas of these lands, about 477 million acres, are the subject and the challenge of this long range program of the Bureau of Land Management.

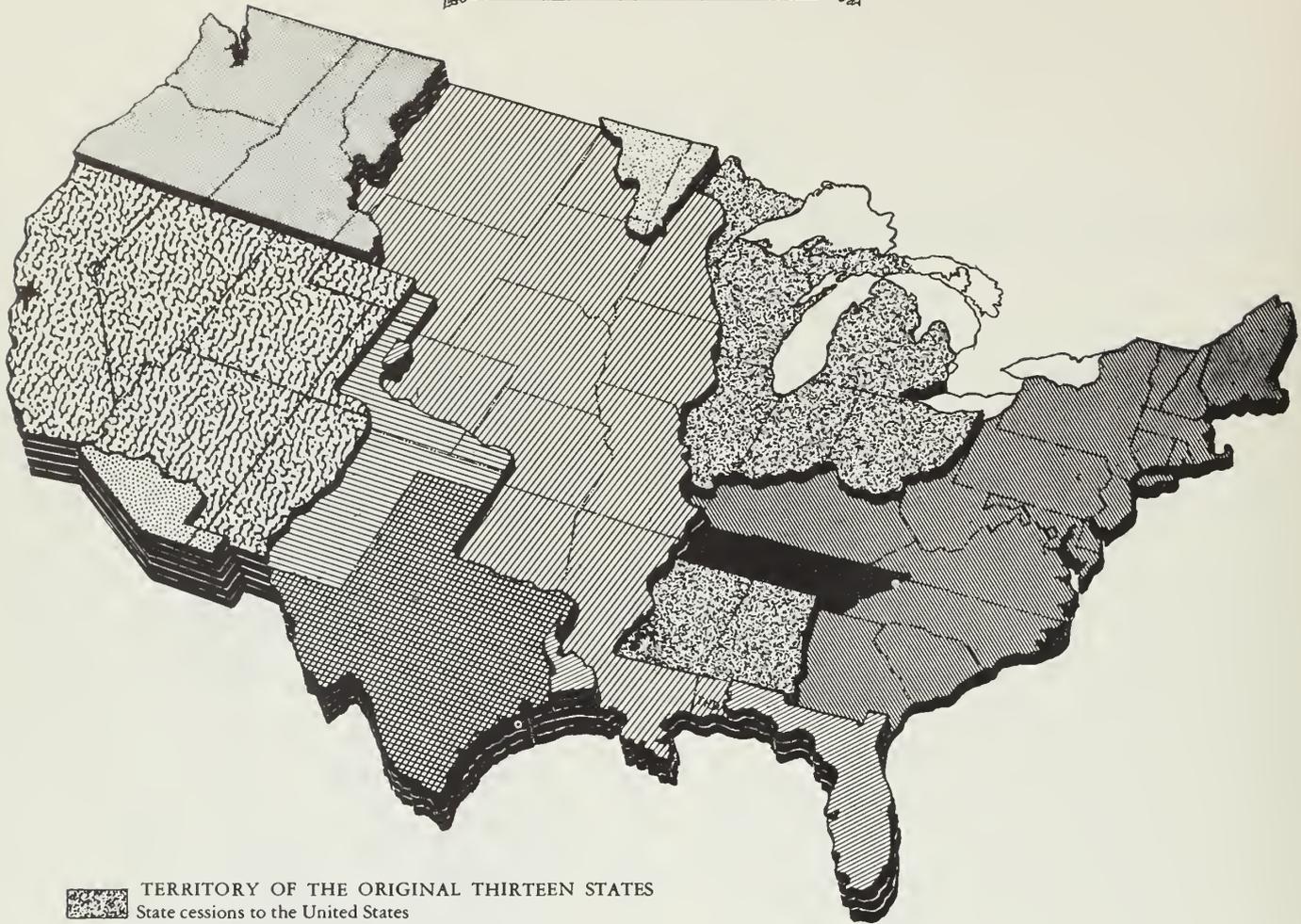
How the Public Domain Grew

At the end of the Revolutionary War, the boundaries of the new Republic were set by treaty with Great Britain. But the boundaries of the Original Thirteen States were not fixed. Seven of these States made claim to areas lying north and west of their present boundaries and stretching as far as the Mississippi River. These claims often conflicted, partly because of inconsistencies in early colonial charters.

As a part of the compromises which led to the formation of a strong central government, these States, between 1781 and 1802, ceded to the Federal Government, with certain exceptions and reservations, all claims to the western lands, thus creating the nucleus of the public domain amounting to about 237 million acres.



ACQUISITIONS



- TERRITORY OF THE ORIGINAL THIRTEEN STATES**
-  State cessions to the United States
 -  North Carolina cession to the United States 1790
 -  United States cession to Tennessee, 1806 and 1846
 -  The Original Thirteen States (present area) plus the District of Columbia

- TERRITORY OF THE REPUBLIC OF TEXAS**
(Annexation of Texas, 1845)
-  United States purchase from Texas 1850
 -  State of Texas (present area)

- OTHER ACQUISITIONS BY THE UNITED STATES**
-  Louisiana purchase from France 1803
 -  Basin of the Red River of the North
 -  Treaty with Spain (cession of Florida and adjustment of claims) 1819
 -  Oregon Compromise with Great Britain 1846
 -  Cession from Mexico 1848
 -  Gadsden Purchase from Mexico 1853



ALASKA
Purchased from Russia March 30, 1867

The public domain grew with the purchase of the area known as Louisiana from France in 1803 for \$23,213,568. The Louisiana Purchase added nearly 560 million acres (including the basin of the Red River of the North, south of the 49th parallel) to the Nation's land estate.

In 1819 Spain ceded Florida to the United States and, along with adjustments of other boundaries and areas west of the Mississippi, added another 46 million acres.

Amid the cries of "Fifty-four or Fight" the United States and Great Britain established the northern boundary of the United States by the 1846 Treaty, known as the Oregon Compromise. With this addition of more than 183 million acres, the public domain then totaled more than one billion acres.

Then, in rapid order, the next 21 years brought to a close the acquisitions of the public domain lands—the Mexican Cession of 1848 amounted to 339 million acres, the Texas Purchase another 79 million, and the Gadsden Purchase an additional 19 million acres. The Purchase of Alaska in 1867 from Russia rounded out the public domain.

It was decided early in the life of the new Nation that the newly acquired lands were to be divided into new territories and States and admitted to the Union on equal footing with the parent States as soon as local governments could be firmly established. The entire public domain was carved into 30 new States, at which time the States waived all claim to the Federal lands within their boundaries.

Early Disposition of the Public Domain

For much of the early history of the public domain, the lands were viewed chiefly as a source of cash revenue for the Federal Government. Lands were also granted to individual citizens and companies in lieu of cash as reward or payment for services rendered and to encourage development of new areas. Among the earliest Federal land grants was the 1796 award of three square miles in Ohio to Ebenezer Zane to maintain a road and ferry service from Wheeling, W. Va., to Limestone.

Beginning with Ohio, each of the public domain States was granted lands for the support of common schools. The first school grants date back to the Ordinance of 1785 and included one section out of each township. School grants reached as many as four sections in each township in later years. As provided by the Congress, these lands could be used by the States to produce continuing revenue for school purposes, or could be sold by the States for cash and the proceeds used for educational purposes. Since the first Ohio school grant in 1803, a total of some 77.6 million acres has been granted to States for the support of public schools.

Other land grants to the public domain States covered a wide variety of internal improvements and projects. These included 1.5 million acres for the improvement of rivers, 3.3 million acres for the construction of wagon and post roads, and 4.6 million acres for the construction of canals. Also granted to the States were some 21.7 million acres for universities, hospitals, and other in-

stitutions as well as 64.9 million acres of so-called swamp lands and a total of some 37.1 million acres as indirect help in the construction of railroads. Land grants to the States also included another 220-odd million acres for other general and unspecified purposes. Total land grants to the States have amounted to about 432.7 million acres.

Total revenues from the dispositions made of public domain lands from 1785 through 1880 amounted to only about \$208 million. During this same period, cash sales for public domain lands accounted for more than 170 million acres. By 1880 nearly 548 million acres of public domain had been transferred to non-Federal ownerships.

In 1785 a system of sales at public auction was established. The public domain was to be surveyed and sold partly in units of 36 square miles and partly in units of 1 square mile. The first land patent (deed) issued by the Government was dated March 4, 1788. Large sales were sometimes made to land companies which would in turn sell smaller tracts to actual settlers. By 1832 a series of laws reduced sale size to 40 acres.

Congress instituted a land credit system in 1800 permitting installment sales. Purchasers of public lands could pay for public lands in four annual installments. Difficulties in the administration of the law quickly arose and were aggravated by a series of measures affording relief to delinquent purchasers. The credit system was abolished in 1820.

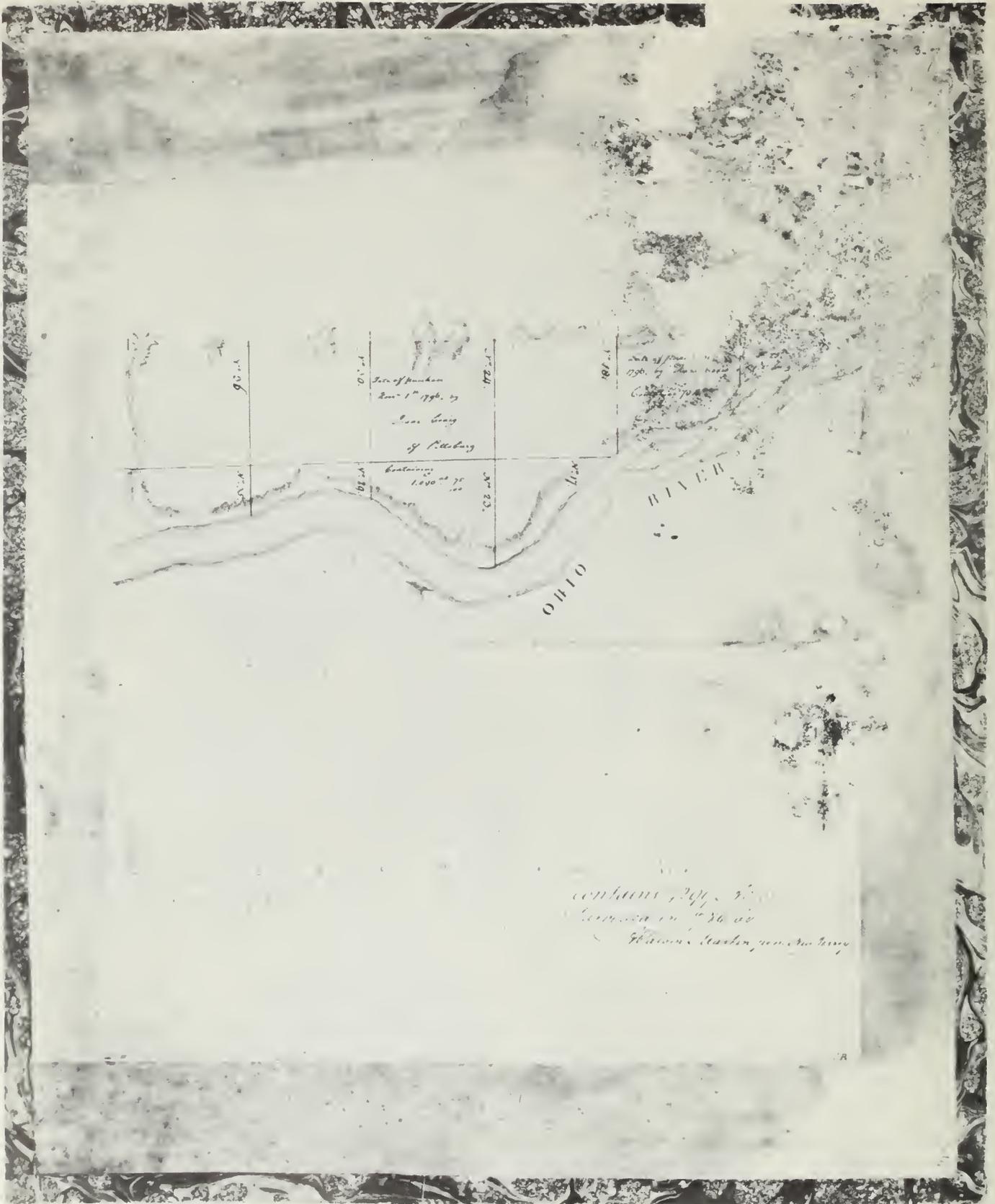
The act of 1820 provided for cash sales of public land at public auction in units as small as 80 acres. Lands unsold were then open for purchase at the minimum statutory price, finally fixed at \$1.25 per acre. In general, this was the system in force until the repeal of the cash sale laws in 1891.

The \$1.25 minimum applied to most public lands but higher minimum prices were later established for certain classes of lands, such as public lands within railroad land grant limits and some ceded Indian lands.

Some advocates of public lands sales sought a system of graduated prices. Such a plan was actually adopted in 1854. The price of public lands unsold after offering at public auction was based on the length of time the land was on the market, those having remained unsold for 35 years or more being valued at 12½ cents an acre. The Price Graduation Act was repealed in 1862, but not before it had accounted for the sale of more than 25 million acres.

The general repeal of the cash sale laws in 1891 did not affect the authority to sell at public auction "isolated tracts" of Federal lands surrounded by private holdings. In 1912 the authority to sell public lands was enlarged to include "rough and mountainous tracts" which were not isolated. At the same time, the Congress abandoned the \$1.25 minimum with respect to sales at public auction—a figure that had often served as both minimum and maximum. Lands to be sold at public auction are now appraised prior to sale, and the appraised price is the minimum price.

Even while many were regarding the public lands as saleable, others were seeking ways of making the land more available and even cheaper to people who were willing to actually settle the



FIRST PUBLIC LAND SURVEY. Township 5, Range 1, Ohio, surveyed by Absolom Martin in 1786, launched the most extensive and orderly system of public land surveys in the world.

lands and develop them. Many sought to obtain such authority simply to validate existing "squatter sovereignty." A series of limited pre-emption laws were passed during the period 1800 to 1841 which gave squatters the right to purchase the lands upon which they settled.

In 1841 the Congress enacted a general pre-emption law which permitted settlers to enter upon public lands, eventually both surveyed and unsurveyed, and to secure patent for them after complying with the rules as to residence and cultivation and after paying for the land at the minimum statutory price. The end of such pre-emption came in 1891, when the 1841 Act was repealed.

Settlement Under the Homestead Acts

The original Homestead Act of May 20, 1862 (12 Stat. 392), permitted settlers to claim as much as 160 acres. The settler became entitled to a patent after constructing a habitable house, reducing part of the land to cultivation, and residing upon the land for a period of five years (reduced to three years in 1912).

Under these conditions, there was no charge for the lands except for nominal service charges. Later modifications of the Homestead Act increased the acreage limit to 320 acres for dry farming lands in the West and to 640 acres for so-called stock-raising homesteads on arid range lands. While no cultivation was needed for stockraising homesteads, range improvements were required instead.

Irrigable lands within Federal reclamation projects were opened to homesteading in 1902 and agricultural lands within national forests in 1906. The Taylor Grazing Act of 1934 ended homesteading under the Stockraising Homestead Act, but the major features of the Homestead Act are still on the books.

Since 1862, people have earned the right to own more than 1,400,000 homesteads, covering 247 million acres once public domain. This is equal to more than 10 times the size of the State of Indiana. If all of the homestead lands were laid side by side, they would cover a broad strip of land more than 125 miles wide all the way from Boston, Mass., to San Francisco, Calif. It is a very interesting fact that about two-thirds of all homesteading was done in the first 30 years of the 20th century—not in the early days of settlement before 1900.

Another of these laws—the Desert Land Act of 1877—is still on the books today. This law applies to public lands which are not cultivable without irrigation. The entryman is not required to reside upon the land, but he must demonstrate that he can irrigate it and cultivate it profitably. In addition, he must pay for the land at the rate of \$1.25 per acre. Only 10 million acres have been patented under this law, largely because of the heavy capital investment required for successful irrigated agricultural development—in the \$40,000 to \$60,000 bracket.

The one place where there has been substantial homesteading activity in recent years has been in Alaska. Opportunities under the Homestead Act of 1862 are limited and are growing smaller day by day as the State government selects and makes application for more and more of the land which may be used and settled for farming development.

The history of homesteading in Alaska in recent years suggests the inability of the law to meet the needs of Alaska land management and farming enterprise development. Out of more than 325,000 acres in Alaska which have been patented under the Homestead Act, only about 22,000 acres are being farmed today. Much of the land has been abandoned. Some is being used for rural residences and part-time garden farms.

The granting of lands to war veterans preceded the Declaration of Independence. In 1776 the colonies promised land bounties to stimulate military enlistments. The first grants were relatively restricted in scope. As time passed, emphasis changed from grants inducing enlistments to grants as reward for military service. The grants became more and more liberal. Legislation in 1855 provided for a grant of 160 acres for only 14 days of service or engagement in a single battle. The original idea of restricting the location of bounty land warrants to induce concentration of veterans on the frontier areas was abandoned by making the warrants locatable on any available public land and by making them transferable.

With the Civil War, the military bounty policy was not renewed. The large number of veterans, the declining area of available public domain, and the large scale transfer of previously issued warrants to speculators militated against such grants. Instead, the Congress turned its attention to the idea of cash bonuses and other aids to veterans.

Special privileges for veterans have been adopted at various times since the Civil War to allow veterans advantages over the general public in the acquisition of public lands. Under the homestead laws, the period of residence on the land and the amount of cultivation required have been reduced, the extent of the reduction depending on the length of the veteran's service.

The first general legislation with respect to sites for towns permitted established communities to pre-empt the lands they occupied. Other laws provided for the survey of town sites and the sale of lots by the Government at public auction. Also, the President was authorized to reserve "natural and prospective centres of population" for subdivision into lots to be sold at public auction.

Disposition of Mineral Lands

General policy has been to differentiate mineral from non-mineral lands and to exclude mineral lands from the operation of the "agricultural" land laws.

From 1807 to 1847, Congress experimented with the leasing of lead deposits, but decided instead in favor of the sale of mineral lands in the Midwest valuable for lead and other ores. After the California gold rush, the Congress enacted general legislation governing mineral lands whereby the discoverer of the deposit became entitled to it. He was authorized to receive a patent for the lands upon payment of \$2.50 (placer claims) or \$5.00 (lode claims) per acre. The general mining laws of 1872 are still in force today. Under several laws still in effect, the subsurface minerals and surface of the public lands may be legally separated, with the surface falling under the "agricultural" land laws.

Despite the general policy to separate mineral and nonmineral lands, and although many of the land laws specifically prohibited settlement and acquisition of mineral lands, many millions of acres of valuable mineral lands were unknowingly transferred during the early 1800's out of Federal ownership under the public land laws. The reasons for this are plain. Very little was then known about the existence of mineral and ore deposits. Geologic and mineral investigations were superficial and only in infancy, and many of the minerals regarded as valuable today were either unknown at that time or were treated as valueless.

Modern public resource management recognizes two classes of mineral lands—those on which mining claims may be staked under the General Mining Laws of 1872, and those on which mineral deposits are available only through leasing arrangements for which the Government receives land lease rentals and royalties and (in the case of competitive leasing) bonus bids for the privilege of leasing the lands for development. Mineral leasing is the largest single source of natural resource management revenues to the Bureau of Land Management.

Since passage of the Mineral Leasing Act in 1920, total revenues from this activity have exceeded \$800 million—nearly four times the total revenues received from the sale and disposition of public lands during the first century of the Republic.

Scant recognition was given to timber as a major resource in the early days of the 19th century. In general, timber was regarded as part of the land and as the land went, so went the timber.

There were several means by which people or companies could obtain land bearing stands of timber.

The Free Timber Act and the Timber and Stone Act were passed by Congress in 1878. Prior to the enactment of these laws, there was no legal distinction between timberlands and other lands. The former act gave the people of nine western States the right to cut timber at will on mineral lands, both for domestic and mining purposes. The latter act authorized the sale of land chiefly valuable for timber, but unfit for agriculture and not previously offered for sale, the minimum price to be \$2.50 per acre and the maximum area sold to one person, association or corporation, 160 acres. Until its repeal on August 1, 1955, the Timber and Stone Act accounted for the disposition of an estimated 13.9 million acres of public domain.

The Public Lands Commission of 1879 presented a comprehensive bill to Congress covering practically all phases of public land administration. It contained a special section on the withdrawal and management of public timber lands, the main objective of this section being the withdrawal of all public lands chiefly valuable for timber, or an alternative objective of setting aside designated portions of these public lands as forest reserves.

Establishment of Forest Reserves

An act approved March 3, 1891, authorized the President to set aside by proclamation national forest reserves out of public domain lands. This law, now generally known as "The Forest Reserve Act," established the principle of Federal ownership of

forest lands and is generally regarded as one of the big forward steps in American forestry.

Only 27 days after the enactment of "The Forest Reserve Act," President Benjamin Harrison set aside the first Federal forest reserve of approximately 1,239,000 acres adjoining the Yellowstone National Park in Wyoming.

First appropriations (\$75,000) became available on July 1, 1898, to the Department of the Interior for the administration and protection of the newly created forest reserves. Directly after this appropriation became available, BLM's predecessor agency, the General Land Office, acting for the Secretary of the Interior, began the development of an organization to handle these reserves. In 1901, a Forestry Division was created in the General Land Office of the Department of the Interior. The administration of national forest reserves was transferred from the Department of the Interior to the Department of Agriculture on February 1, 1905.

For the first time in the history of American forestry a plan of sustained yield management was authorized and outlined for a specific Federal forest property by the enactment of a law on August 28, 1937, providing for the administration by BLM of the revested Oregon and California (O & C) Railroad and the reconveyed Coos Bay Wagon Road (CBWR) grant lands in western Oregon, totaling approximately 2,681,000 acres. This law provided for the conservation of land, water, forest, and forage on a permanent basis, for the prudent utilization of these resources and for the realization of the highest current income consistent with sound forest management.

The detailed history of the dispositions of the public domain under the Nation's public land and mineral laws is beyond the scope of this historical sketch.

By the turn of the 20th century, the people of the United States were becoming aware that their country's natural resources were not inexhaustible. Vast forests were being logged unscientifically. Bountiful farms and grazing lands were overworked and badly eroded. Beautiful streams and rivers were polluted. Ground water was vanishing, while untold mineral wealth was being disregarded.

In the years that followed, the Nation established national forests, national parks, and national monuments, reclamation projects, power sites, and wildlife refuges as conservation measures. Laws and regulations governing oil and gas leasing and controlling other mining operations were adopted. Other conservation legislation was to follow.

Conservation of Grazing Lands

A large gap in Federal land management was closed in 1934 with the passage of the Taylor Grazing Act. This act provided for the management of a large portion of the unreserved public domain outside Alaska. The land classification provision of the act authorized the Secretary of the Interior to classify the affected lands. This practically ended the era of indiscriminate settlement of the public domain and permitted the institution of procedures to provide for the orderly disposition of the unreserved

public domain, either by transfer to private owners or management by the appropriate land management agency, Federal or local.

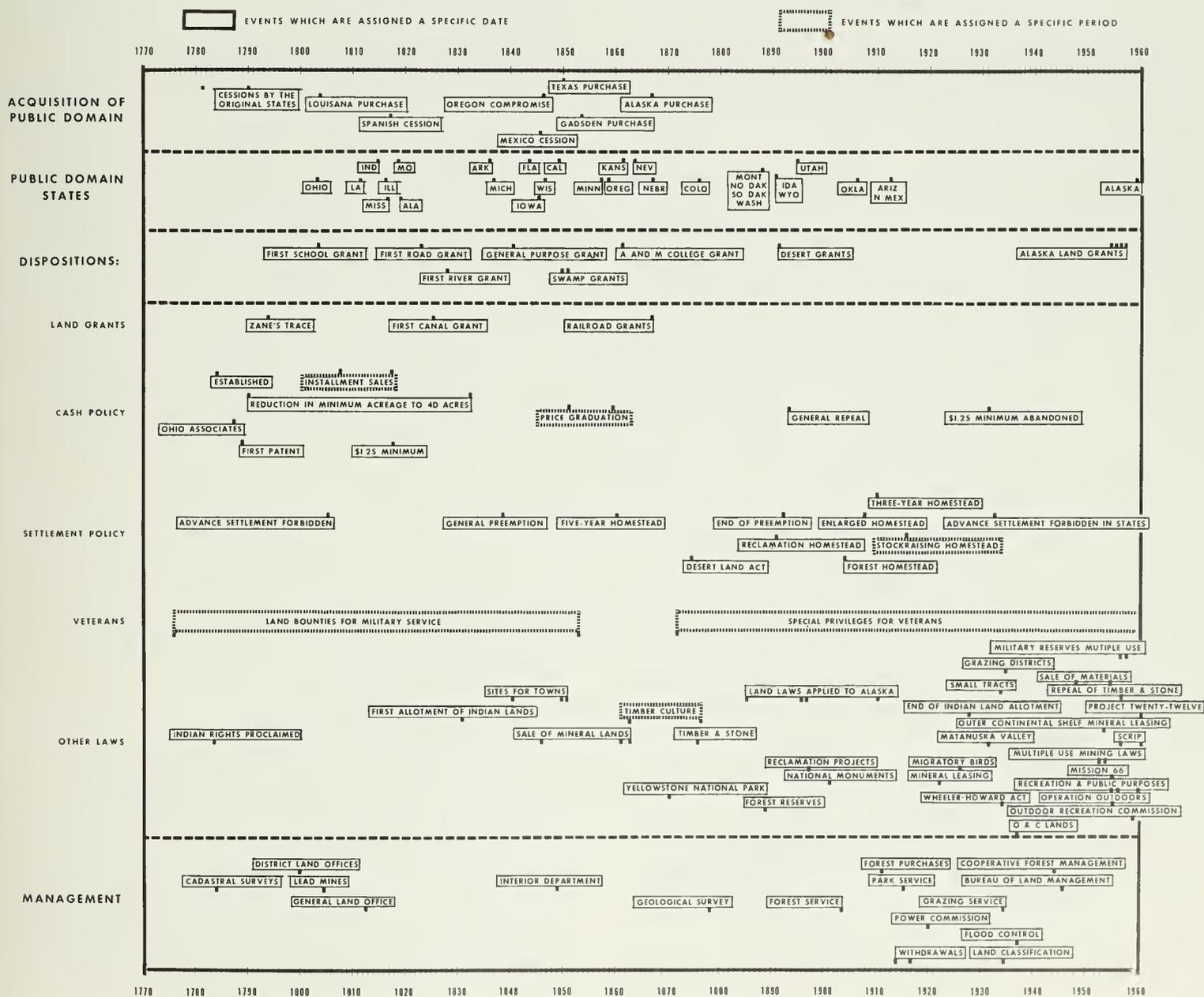
The Taylor Grazing Act also provided for the establishment of grazing districts to foster conservation of the range and stability to the dependent livestock industry. Under the Department of the Interior, the Grazing Service was organized to administer the grazing districts while the General Land Office was responsible for other features of the Taylor Grazing Act and administration of public domain outside of grazing districts. To achieve unity of management of the unreserved public domain, the Gen-

eral Land Office and the Grazing Service were abolished in 1946 and their functions and personnel transferred to the new Bureau of Land Management.

The management of public domain lands since 1946 has progressed through the welding together of many uses and sometimes competing programs. Today the Bureau of Land Management represents the Federal Government's leading multiple use resource management agency with programs covering range management and conservation, forestry, minerals, public land surveys, and the classification and disposition of lands to their highest use or best tenure.

Figure 4

HIGHLIGHTS IN THE HISTORY OF THE PUBLIC DOMAIN



One of the major features of recent public domain management has been the growth of needs for lands formerly regarded as worthless desert. Under the impact of a growing population and an expanding economy, the publicly owned resources under the jurisdiction of BLM are today more valuable than they have ever been in past history. Their value is destined to increase even more in the future.

As the Federal Government's land programs and policies have evolved from early efforts to promote disposition through the area of restraint and reservation to modern conservation programs, BLM has adopted new techniques and new policies to meet new problems and new needs.

Conservation Benefits the Whole Nation

Though the early program goal of using the public domain as a large-scale source of Federal revenue never materialized during the period of rapid settlement and development, the net revenues from accelerated management and development programs in recent years have been substantial. In fact, total revenues from Our Public Lands during the last 10 years have more than equaled all of the receipts during the previous 150 years! BLM receipts since organization of the Bureau in 1946 have now totaled more than \$1.2 billion. During that same 13-year period total appropriations for the management of lands and resources by BLM have been only some \$158 million—a ratio of more than 7½ to 1.

Such a record during the last few years clearly demonstrates the positive relationship between the amount of investment in resource management and development programs and the even greater public revenues which result. This measure, of course, does not take into account the tangible and intangible values of the projects and work completed.

BLM programs directly benefit more than just the Federal Treasury. Part of the receipts from Bureau activities are distributed to the public land States. Such revenues represent important sources of money to the States and counties. Since 1946, BLM receipts have been distributed as follows: \$350,045,294 to 29 public land States (of which \$86,997,414 went to the 18 western Oregon timber land counties); \$368,359,066 deposited to the Reclamation Fund; \$430,105,865 to the General Fund of the Treasury; \$1,603,816 earmarked for Indian Trust Funds; and some \$5,939,576 returned to the grazing districts for range improvements.

Gross receipts from the sale and management of public lands and resources from 1946 through 1959 totaled \$1,156,053,654. These receipts came from the following sources: mineral leases and permits, \$906,556,614 (including \$205,274,359 from rents and royalties on the Outer Continental Shelf); timber sales, \$188,314,848; sales of public lands, \$19,695,711; grazing leases, licenses, and permits, \$26,006,023; fees and commissions, \$8,152,845; rights-of-way, \$989,950; and \$6,337,683 from all other sources.

CHAPTER 2

The Half Century Ahead—1961–2012

DYNAMIC GROWTH and change will undoubtedly be among the most significant characteristics of the coming half century in the United States.

The projections of national conditions of significance to the programs of the Bureau of Land Management during the half century ahead have been developed by public or private agencies with considerable experience in this field. When available and appropriate, these data have been used as a source or base for further projections. Significant future changes which affect the premises used in these projections will require changes in the projections.

These estimates of national needs or developments provide a frame of reference for developing a program for the Bureau of Land Management during the next 50 years. This program is based on rational design, not chance.

The foundation of all changes throughout the United States during the next 50 years (and for corresponding changes in BLM programs), is a rapidly expanding population. By the end of this era the population of the United States will probably be more than double the nearly 180 million estimated at the beginning of 1960 (see fig. 5). The population of the western States, where

BLM lands and resources are concentrated, will probably triple during the same period.

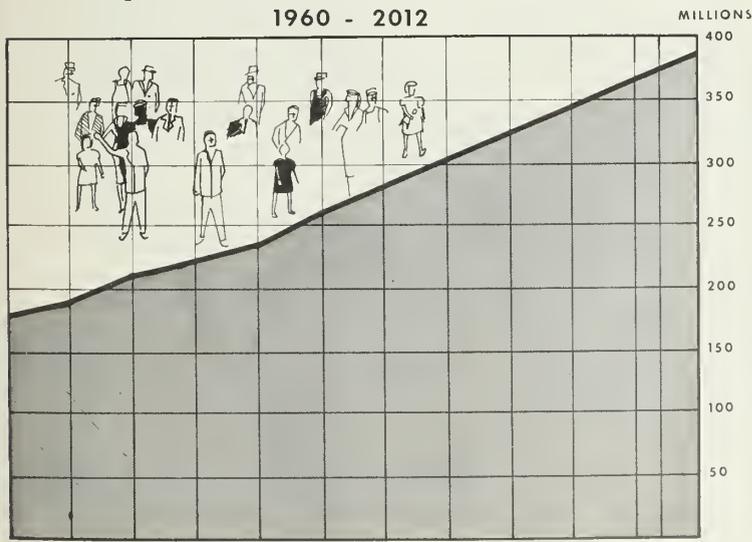
A continuation of high levels of employment is also presupposed in the projections for the half century ahead.

With a substantially greater number of people, correspondingly greater demands will be made upon the Nation's basic material resources. For example, estimates indicate that by 1975 at least 450 billion gallons of water will be needed daily for domestic, industrial, and other purposes—about double the amount currently being used. By the year 2012 needs for water will be more than proportionately greater.

Of particular significance to programs for future BLM operations are the anticipated needs for materials which will probably be supplied in large quantities from Federal lands administered by BLM. Among these are the following:

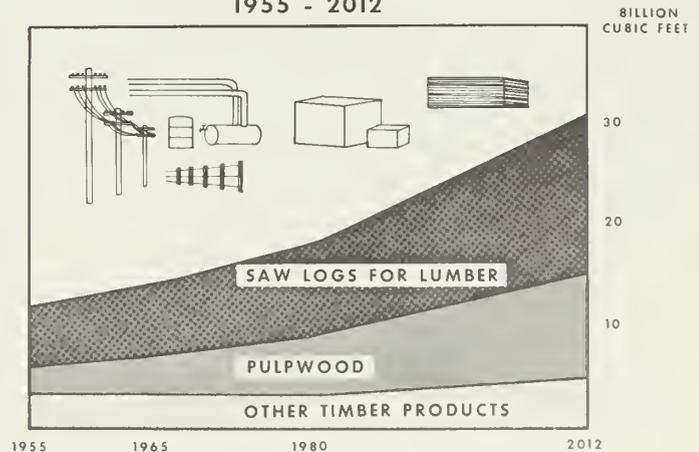
1. Within a quarter of a century the Nation's annual energy needs from natural gas, fuel oil, and hydroelectric sources are expected to double—it is not unlikely that these needs will double again by 2012.
2. Consumption of nonfuel minerals is expected to increase by about 75 percent by 1975.
3. The annual national needs for wood products and their derivatives in 2012 are expected by the Forest Service, U.S.

Figure 5. UNITED STATES POPULATION
1960 - 2012



Source: U. S. Department of Commerce to 1980 (Series II Fertility Rate); 1980-2012 BLM Projection

Figure 6 UNITED STATES WOOD REQUIREMENTS
1955 - 2012



Source: Projection of data contained in Forest Resource Report No. 14, U.S.D.A., January 1958

Department of Agriculture, to be approximately double current utilization (see fig. 6).

4. In the Department of Agriculture's report, "A 50-year Look Ahead at U.S. Agriculture", a steady increase is estimated in the amount of food products which will be needed by 2012—no less than double the current consumption is anticipated. The need for domestic livestock for food and other purposes is estimated to increase at approximately the same rate throughout this period.

5. Notwithstanding the need for more goods and services in the coming half-century the amount of leisure time for citizens of the United States will gradually increase during that period. It is probable that much of this leisure time will be taken up in more outdoor recreational activities (see fig. 7).

Dramatic scientific and technological advances, together with improved techniques and processes can be expected from research and development efforts during the next 50 years. Those which will have a special impact of BLM programs and operations during that period include:

1. Wide application of mechanization and automation in industries and operations directly or indirectly related to processing, distributing, and using products made from mineral, wood, and other raw materials produced from Federal lands administered by BLM.

2. Development of a process for large-scale, economic conversion of brackish and saline waters for agricultural, domestic, and industrial purposes.

3. Development of transportation systems and facilities for rapid movement of large numbers of people from urban areas to and from rural recreation sites.

4. Improved techniques and facilities for protecting the Federal lands and their resources from damages due to fire, insects, diseases, or other hazards, together with comparable improvements in methods and facilities for repairing pre-existing damages or those which might be unavoidable.

The combination of increasing population, growing needs and production of goods and services, and rapidly advancing science and technology add up to an expanding national economy. According to the "Economic Report of the President" for 1960, during the final quarter of 1959 the approximate value of the total output of goods and services, or the gross national product, climbed to a level of \$482 billion—or about 87 percent more than the level at the end of the previous decade. The National Planning Association has estimated that the gross national product will be about \$790 billion in 1970 or 64 percent higher than the present level. Extending a more conservative projection developed by the Bureau of Mines indicates a gross national product for 2012 of about \$2,400 billion (see fig. 8).

Figure 7 NATIONAL RECREATIONAL DEMAND
1930 to 2012
VISITS TO NATIONAL PARK SYSTEM, NATIONAL FORESTS,
STATE PARKS, PUBLIC DOMAIN AND O&C LANDS.

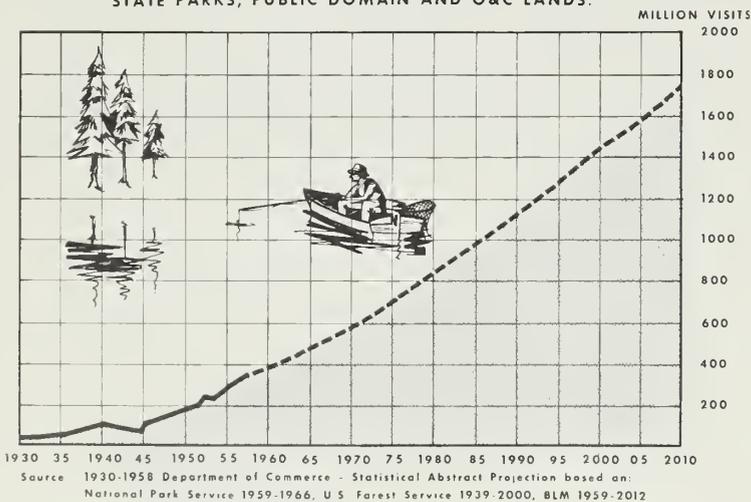
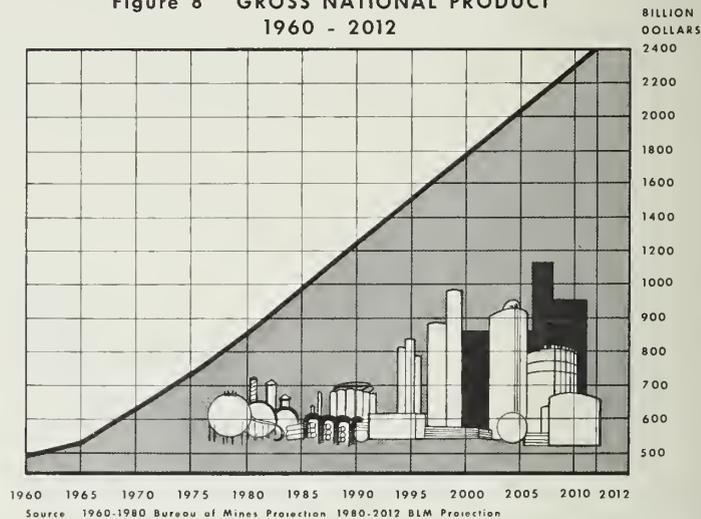


Figure 8 GROSS NATIONAL PRODUCT
1960 - 2012



CHAPTER 3

The Public Domain in 1960

HISTORY helps explain some of the reasons for present-day patterns of land ownership, and the condition of the resource base. However, history cannot in itself provide the whole basis for guiding future action. Knowledge about the present must be added to that from the past in order to move forward confident that the selected course of action will nourish a democracy which promises a better life to its people.

Like the shopkeeper who must replenish his stocks and make his plans for tomorrow, for next week, and for next year, the shelves must be inventoried and the outlook for the future evaluated.

Like the shopkeeper, the BLM finds the inventories of its resources are affected by dynamic technological, economic, social and cultural factors. Because of these factors, the Bureau's resource inventory function is a continuous one. The data in this chapter, while not of the degree of precision desired, are the best and most recent currently available; they represent the present basic facts about the public lands and resources which are considered in developing plans for their future conservation and use.

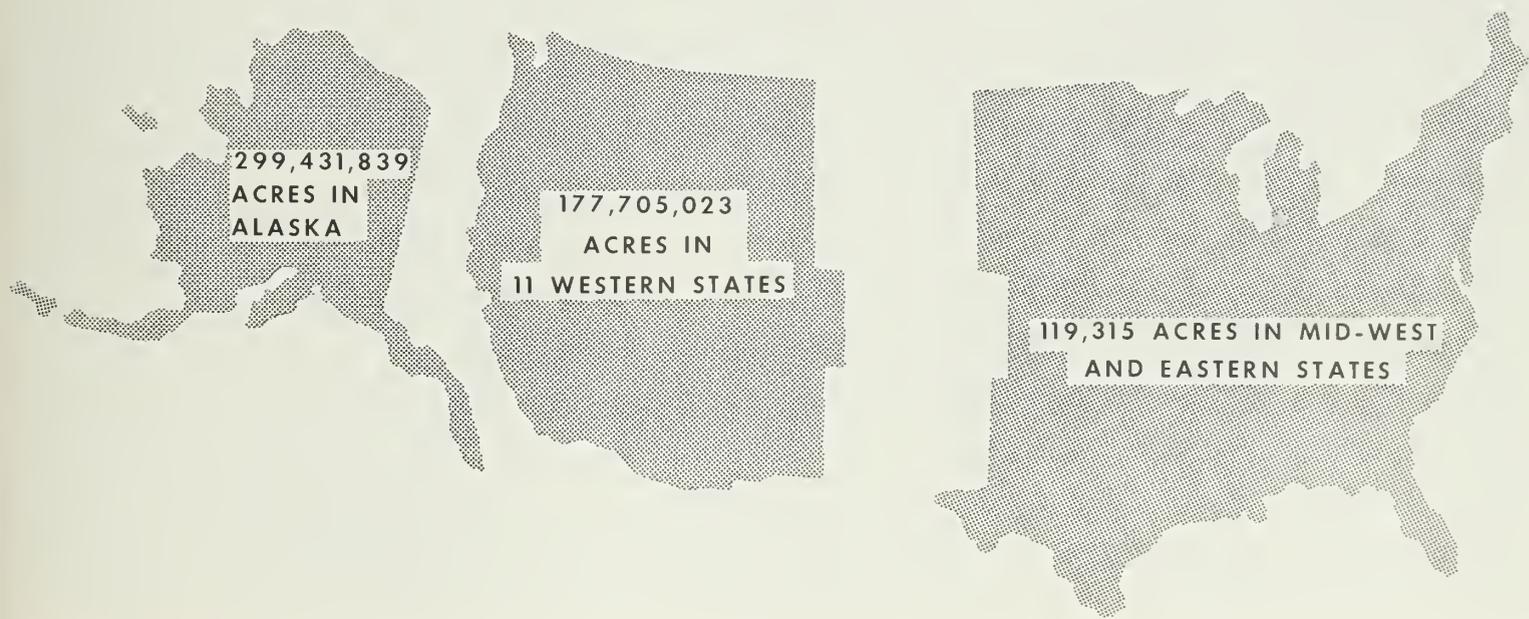
Total Land Areas

The Bureau of Land Management has exclusive jurisdiction and management responsibility for 477 million acres of land. Most of this area lies in 12 western States.

LOCATION OF FORESTED AND NON-FORESTED LANDS UNDER JURISDICTION OF BLM

Location	Forested		Nonforested (grass, brush, nonvegetated) acres	Total acres
	Commercial acres	Noncommercial, acres		
Alaska	40,000,000	85,000,000	174,431,839	299,431,839
Other public domain States	3,812,779	28,864,868	143,001,573	175,679,220
O. & C. and CBWR lands, Oregon	2,024,064	121,053	2,145,117
Total	45,836,843	113,864,868	317,554,465	477,256,176

LOCATION OF BUREAU OF LAND MANAGEMENT LANDS



Lands Inside Grazing Districts

Over four-fifths of the unreserved public domain in the western States lies within the boundaries of 59 grazing districts established under the authority of the Taylor Grazing Act of 1934. There are no organized grazing districts in the State of Washington.

<i>Grazing district lands</i>	<i>Millions of acres</i>
Total area inside boundaries.....	257
Area administered by BLM.....	161
Under exclusive BLM jurisdiction.....	148
Other Federal.....	12
Non-Federal	2

Sample range condition and trends studies of carrying intensity have been conducted by the Bureau for the past several years. These studies show that 2.6 percent, or 3.8 million acres of the area under its exclusive jurisdiction in the grazing districts are not usable for grazing by domestic livestock and wildlife be-

cause these lands are extremely rocky, steep, or for other reasons, cannot support forage growth. This means that a little over 144 million acres of Bureau lands in grazing districts are considered suitable for grazing, ranging from a low to a high level of productivity. The present productivity and carrying capacity of a large percentage of the 144 million acres is relatively low because of natural adverse weather and soil conditions. Some two-thirds of this total area is subject to improvement under the present practices now being carried on. The other one-third consists of the low desert areas in southern Nevada, southeastern California, and southwestern Arizona. These lands can be stabilized and protected for watershed requirements. In addition to this stabilized contribution to the livestock economy, they will also contribute to wildlife needs and constitute a base for increased outdoor recreation.

In past decades, the grazing capacities of the public lands had been seriously reduced due to such factors as climatic ravages, uncontrolled use, and neglect. This condition has been recognized for many years. Some progress has been realized from ef-

RANGE LAND in excellent condition.



forts directed toward adjusting carrying capacities of grazing lands. As a means of determining the condition of the range, a program was initiated some 7 years ago to measure the condition and trend of the resources on all grazing district lands. The survey evaluates responses to range use and development and associated climate. The evaluation is based on the condition of the vegetative cover and the soil in relation to their optimum productivity potential as limited by climatic factors, soil, topographic and geologic influences.

The greatest potential for improvement and increase in grazing capacity is in the more favorable sites where soil and climate conditions are conducive to plant growth. Depletion from past over-use has been accentuated in areas of easy access and proximity to water. A large portion of the public range lands has extremely low productivity potential and negligible improvement can be expected on these lands due primarily to limiting conditions and topography. Surveys to date indicate an improving trend on approximately one-fourth of the range areas and that the remainder is in need of further attention and treatment.

Grazing lands outside of districts have not been afforded the

same degree of attention and management as grazing district lands, due to their isolated and scattered pattern. Condition and trend records have not been completed for all areas. Studies indicate, however, that a trend similar to that for areas inside of grazing districts is taking place. These lands also afford considerable opportunity for improvement and increases in grazing capacity.

On the first of July 1959, there were 27,290 ranchers and farmers holding leases and permits to graze 9,998,780 cattle, sheep, horses and goats on public grazing lands managed by BLM in the western States. This large number (28.5 percent of the total 34,978,000 domestic livestock animals on farms and ranches in the western States in 1959; nearly 5 percent of all 211,381,000 livestock in the United States that year) will, for the most part, obtain only a portion of their total annual forage requirements from Bureau lands during the year. Each of these animals will graze an average of 3.9 months on Bureau lands, chiefly during the spring and fall seasons.

An additional 1,210,203 antelope, deer, moose, elk, mountain sheep, and other big game animals obtained part of their forage

RANGE LAND in good condition.





RANGE LAND in fair condition.



requirements from BLM lands in 11 western States during 1959.

Bureau lands in 11 western States produced more than 6.3 million tons of usable forage to support these domestic and wild animals in the 1958-59 grazing season.

Commercial Forest Lands

The present volume of timber on BLM's commercial forest land based on present utilization standards, is estimated at 250 billion board feet.

Estimated current annual productivity of Bureau commercial forested lands in the West and Alaska is 2.6 billion board feet of merchantable timber. This volume may be cut and removed from the forest for conversion into wood products each year without depletion of the original volume of timber.

During fiscal year 1959, the Bureau sold 1,082 million board feet of timber at an average selling price of \$29.95 per thousand board feet.

The noncommercial forest land total of 114 million acres consists of lands which support a forest growth, but due to currently prevailing economic conditions, the forest growth is not considered commercially operable at present.

An active tree planting and seeding program is under way on the Bureau's commercial forest lands to bring all forest lands into full production and to insure the sustained production of timber year after year. About 198,000 acres need to be reforested, and a major portion of this area will require site improvement projects to remove the existing ground cover of grass or brush, so that the young trees can establish themselves and grow faster.

Values of Lands and Resources

The current estimate of the value of all classes and kinds of the 477 million acres under BLM jurisdiction, except for the value of mineral deposits which are known or suspected to underlie these lands, is approximately \$2.4 billion or about \$5.07 per acre. The current value of 519 buildings on these lands is \$3 million, and of other structures and improvements, including access roads, \$25 million.

Unsurveyed Lands

By June 30, 1959, nearly 76 percent of the 1.8 billion acres which constituted the original public domain had been surveyed by either the metes and bounds or the rectangular system.

OUR PUBLIC LANDS supported more than 1.5 million big game animals in 1959.





RECREATION. BLM lands provide vast recreational opportunities for millions of American families.

Of the 475 million acres administered by all Federal agencies remaining unsurveyed, more than 76 percent (363 million acres) is in Alaska. Outside of Alaska, remaining unsurveyed lands lie in 11 western States. Owing to obliteration of corners by natural elements and development of the country, a considerable portion of the surveyed public domain is in need of resurvey to re-establish the boundaries of lands administered by the Federal Government.

Mineral Resources

In addition to providing for orderly development of mineral resources on its own land, the Bureau administers mineral management and disposition programs on other Federal lands, on certain private lands and on the submerged Outer Continental Shelf lands in the Gulf of Mexico.

Mineral production from both public domain and acquired Federal lands during fiscal year 1959 included 142 million barrels of petroleum, over 445 billion cubic feet of natural gas, 132 million gallons of gasoline; and 148 million gallons of liquid petroleum gas. In addition, submerged lands on the Outer Continental Shelf

under Federal lease yielded 31 million barrels of petroleum and 178 billion cubic feet of natural gas.

Total receipts during fiscal year 1959 from all mineral leasing activities conducted by the Bureau of Land Management were \$96 million, of which the major portion was from oil and gas rental and royalty payments.

Vast quantities of metals and other so-called hardrock minerals are extracted from the public domain under the authority of the mining laws. While there is no direct payment to the Federal Government for the right to develop such minerals, the Nation's economy is benefited by the availability of these resources. Virtually all of the 5.2 million tons of uranium ore produced domestically in calendar year 1958 was from Federal lands. This ore was valued at \$116 million. A large percentage of the copper, lead, zinc, silver, gold, and other metal production in the United States up to the present time was from land in Federal ownership, or land to which private title has been obtained through the mining laws.

The present real estate or income value to the Federal Government, in the form of rentals, bonuses and royalties for the next 20 years, of the leasable minerals in the public domain and the Outer Continental Shelf, is estimated at about \$5 billion. This includes the value of oil, gas, coal, potash, sodium, and phosphate.



OVER 20 MILLION ACRES of BLM lands can provide outdoor recreation to countless Americans when they are properly developed.

The present market value of estimated known deposits of all other federally owned minerals currently in production is more than \$12 billion. Another significant resource is the oil and shale deposits on public land in Utah and Colorado not yet in production, with an estimated petroleum content of 1½ trillion barrels, and a present in-place value of \$1 billion. Mineral deposits, by their very nature, defy accurate inventory and the above estimates are conjectural. They are based on current production figures and will be subject to revision as economic conditions change, as new deposits are discovered and developed, and as technological progress creates a demand for lower grade ores and types of minerals not now in demand.

Recreation

There has been relatively little development of the recreation resource values of BLM lands by the Federal Government. Only in Alaska has there been substantial effort to provide facilities for public enjoyment of the outdoors on these lands through various forms of recreation use. This has been performed under special legislation passed by the Congress in 1956. In the past 3 years, 51 different sites, chiefly roadside picnic and camping areas, have been constructed under Bureau supervision at an approximate cost of \$300,000. All of the developed areas have been turned over to the new State government for operation and maintenance.

FIRE burned over 11 million acres of BLM lands in the last 10 years.



Recent estimates of the present and potential value of its lands for various types of public recreation use have been made by the Bureau of Land Management in an effort to identify the size of the future job in outdoor recreation resources management.

These estimates show that there are more than 2,000 separate sites on Bureau lands, varying in size from a few acres to more than 1 million, which have some present use or potential value for recreation. Over 1,400 of these areas are already being used by the public, even though minimum development required for proper and healthful use has not been effected. The recently compiled estimates indicated that more than 2 million people probably used these areas last year. At least 20 million acres of

Bureau lands in the West can be developed to meet the spiraling demands of the public for outdoor space to rest and play.

Fires

In the past 10 years more than 11 million acres of public lands managed by the Bureau have been burned over by 10,639 separate fires. Almost half this area, 5,160,071 acres, was burned during one year—1957. Over 1,100 fires burned 688,073 acres of Bureau lands in 11 western States and Alaska in 1958. Timber, forage, wildlife, watershed, and recreation values destroyed by fires in the past 10 years have been estimated at \$38 million. Suppression costs, and expenditures for presuppression activities during the same period amounted to over \$20 million.

A Program for Our Public Lands, 1961-2012

FOR ALMOST a century and a half, Our Public Lands and their resources have had a prominent role in the historic, economic, social and political development of the Nation. During much of this period it seemed that the supply of these resources would forever exceed the demand. Generous grants were made to establish transportation and communication facilities throughout the continent; new States were given grants for various purposes, including schools. A grateful Nation made land available to those who had served it in time of war. Other lands were made available to citizens for homesteads, and certain rights were granted as incentives for exploration and development of mineral and other resources.

A vast wilderness was rapidly transformed into an industrialized united Nation with a high standard of living.

During the past two decades, in response to demonstrated public needs, BLM has increased the emphasis on intensive and concurrent development, use, and management of all the public lands and their resources.

Now and for the future BLM anticipates responsibilities for intensive land tenure arrangement and resource management programs. These affect lands, minerals, range, forestry, recreation, and cadastral surveys.

In addition to these programs for lands under the Bureau's exclusive jurisdiction, BLM has responsibilities for managing the mineral resources on lands now in private ownership, on which the Federal Government still owns the mineral rights. BLM also administers the mining and mineral leasing laws on other federally owned lands, the primary management responsibility of which rests with other agencies.

It has been increasingly apparent that the Nation's public lands and their resources are in fact not without limit—that to provide an adequate supply of raw materials for the future needs of the Nation will require development of these lands and their resources to their optimum levels.

Orderly, efficient, and sound development and use of the resources administered by BLM for present and future needs can best be assured through a program which provides for a balanced, coordinated, and sustained effort throughout the foreseeable future.

Anticipating the population and gross national product projections for the United States, the Bureau's long-range program will have the following characteristics:

1. Throughout the period of the program the Bureau of Land Management will continue its historic function and policy

of making public lands available for State and private use or ownership after determining that a higher and better use of the lands and their aggregate resources, and the total public interests are thereby served. (The rate and extent of this process will be primarily dependent upon public and private demand for lands, enactment of legislation authorizing land transfers not now possible, and repeal of those laws not suitable to present day land use and tenure needs.) This report assumes that the Mineral Leasing Act of February 25, 1920, as amended, will continue to be the governing legislation for the private acquisition of leasable minerals, and the General Mining Laws of 1872, as amended, will remain in full force and effect and will be the governing legislation for private acquisition of locatable mineral resources.

2. Federally owned lands having public use values as their highest and best use will continue to be managed by the Federal Government to assure their proper protection in the public interest.

a. BLM management of such lands will be continued if the highest and best use of such lands and their aggregate resources is thereby assured. If such use can best be assured by some other Federal resource management agency, transfer of the lands to such agency will be undertaken. Pending any transfer, suitable management of the lands and their resources will be provided by BLM.

b. Such lands which are presently managed by other Federal resource management agencies and which can be managed for their highest and best use by BLM will be transferred back to the public domain and provided suitable management by BLM.

3. The designation of lands for management by Federal agencies or for title transfer will be subject to continuous review since passage of time may bring about changes in public and private needs for public lands, and, in turn, affect the criteria used in their classification.

4. Local agencies of governments will assume increasing responsibilities for management of lands having values for local public purposes in or near their areas of jurisdiction.

5. The social, economic, and legislative factors which will govern the rate of transfer of land to other forms of tenure and the retention of land for Federal management will include:

a. Increasing industrial development of lands in the West, and settlement and development on rural land in Alaska.

b. Increased urbanization enveloping public domain land around population centers and along highways.

c. All land grants to States will be satisfied by 1975, except Alaska, which will be completed by 1985.

LANDS

The Bureau administers public land laws which authorize the arrangement of public land tenure. These laws, by their nature, can be categorized as:

- Agricultural.
- Sale.
- Exchange.
- Grant or Selection.

Those transferring limited rights or interests in title.

The *agricultural* land laws authorize the transfer of title to individuals for lands which are principally valuable for the production of crops.

The *sale* laws authorize sale of lands at not less than the fair market value, except in certain instances where lands are sold to public or nonprofit agencies at reduced prices.

The *exchange* laws authorize the exchange of public lands for private or State-owned properties of equal value.

Grant or selection laws provide for transfer of public lands to States either in satisfaction of obligations the Federal Government made to the States upon their admission to the Union, or in lieu of State lands that were included in Federal reservations.

Laws authorizing the *transfer of limited rights or interest* provide for the use of Federal lands for rights-of-way, easements, and certain other specific purposes.

Historically, citizens who wished to exercise an individual prerogative to obtain an interest in public lands indicated their desire to the Bureau and its predecessor agencies, and appropriate action was taken on their requests. This system worked reasonably well during the past century because the alternative demands for public lands were not great and the amount of land available for all types of use appeared unlimited.

The fact that public lands and their resources were not unlimited was recognized by statute in 1934 by passage of the Taylor Grazing Act. This Act required the interests of the public in general to be considered paramount to the interests of individuals.

Classification of land for its best use was authorized by the Taylor Grazing Act. Land classification as applied to the unreserved public domain is usually the determination whether the national, social, and economic needs can best be served by placing the lands in individual ownership or by retaining them for resource use benefiting the public in general.

FAILURE—proper land classification precludes use of land for enterprises which cannot succeed.





DOING A LAND OFFICE BUSINESS. New BLM public land records system in operation.

Current Situation

Since World War II, national economic and social conditions affecting the public domain have changed drastically, resulting in a tremendous increase in land and resource uses not previously envisaged. The inevitable result was a rapid rise in land value and greatly increased competition for the use of public lands and resources. The price per acre received from sale of public lands has doubled since 1954. Prices of more than \$500 per acre were not uncommon in 1959 for parcels well suited for intensive use.

The drastic change in economic conditions affecting the unreserved public domain led to serious administrative problems. The Bureau has been forced to do a great deal of classification work resulting in rejection of individual applications for land use or ownership. This was necessary in order to protect the total public interest in the face of individual desires. A tremendous workload has resulted from this method of operation and many delays were incurred in the physical handling of individual transactions.

The backlog of pending individual requests or applications for lands at times has amounted to more than a full year's work. The acreage classified *not suitable* for transfer as requested has

averaged close to half of the total area classified, and in 1959 this amounted to over 1 million acres.

In spite of the problems created by the physical processing of these large numbers of applications, many of which required rejection, substantial achievements have been made during the last few years. Thousands of decisions and land tenure arrangements have been made in response to individual requests for land or use of land. State selection programs have reached virtual completion in many States. Substantial acreages have been transferred to private ownership where such ownership was in the public interest.

Perhaps the most important achievement was the protection of the general public interest by refusing to approve applications that would not place the land to its highest and best use. In processing these rejections, the public interest was protected but the land remained in the same status and condition as before. This activity required the expenditure of a large proportion of the funds appropriated for administration of the land laws, but did not result in any net increase in the treatment or administrative effort devoted to the lands.

Classification work resulting in the rejection of applications is not all lost motion. Frequently such classifications indicate the alternative potential uses of the land. The defect in this sys-



MULTIPLE USE areas are managed for public benefit. This one has values for grazing, mining, timber production, watershed protection, wildlife habitat, hunting, and other forms of extensive recreation.

tem is that it does not readily and efficiently lend itself to programs of land ownership adjustment designed to meet specific national resource management and land use needs, and is a very costly way to protect the public interest.

In an attempt to modernize lands operations to cope with present conditions, specific techniques have been pioneered in the western States. These are designed to gain control over the individual application process so that a classification program may proceed systematically. Initial results of these techniques prove their workability. The Bureau's program is based upon the extension of these techniques to the entire lands operation. If these techniques are not extended, the achievement of BLM land ownership arrangement goals will cost several times the amounts programed. Basically, these modernized methods will result in a controlled lands program which will allow for the orderly processing of applications.

No changes are contemplated in the present method of public agencies indicating their desire for unreserved lands, under any appropriate law. Also, applications for rights-of-way, easements, and other comparable uses of public domain will be received and the necessary tenure arrangements achieved in the historic manner.

Program Goals

The unreserved public domain lands and resources will be placed in a pattern which will facilitate their best use. This will include both stabilization of certain lands in Federal ownership and transfer of other lands to other appropriate forms of tenure.

This goal also provides for a continuous review of existing public land ownership or tenure arrangements so that changes can be made when consideration of national economic and social needs indicates the desirability of such change. This recognizes the important premise that highest and best use classifications of land are not necessarily static, and must change to meet changing public needs. In the accomplishment of this general goal, four specific goals will be achieved:

1. A systematic investigation of the unreserved public domain will be made on a selective and priority basis looking toward land tenure arrangements designed to identify and classify areas having particular suitabilities for:

- a. Obvious recreational values, so that they may be either transferred to an appropriate entity for administration in the public interest, or their tenure stabilized for administration by the Bureau.



INDIVIDUAL RECREATION. A typical cabin in the desert developed on public domain lands under authority of the Small Tract Act.

b. Multiple use values, including extensive recreation, timber production, watershed management, mineral production, and others, which can best be federally managed. This classification will stabilize the tenure of these lands and will implement intensive management programs necessary to effectively utilize the resources involved.

c. Achievement of land patterns necessary to properly manage public domain resources. This may be accomplished by land exchanges. First priority will be given to achieving an optimum land pattern in areas requiring intensive Federal management. High priority will be given to arranging public access to areas of public land having extensive recreational values.

d. Completion of appropriate title transfers where public, economic, and social need factors require private ownership of the land to foster economic development, or where Federal administration is not essential to meet public needs.

2. Previous classifications will be reviewed, making any changes which would be in the public interest as a result of changed local or national economic or social conditions. Withdrawals will be reviewed on an orderly and selective basis to insure that reserved public lands are needed, both as to extent and type, for the purpose for which they were set aside.

3. Applications for grant or selection or for specific interests in lands other than title transfer will continue to be processed in the manner currently employed.

4. The Bureau will continue providing information and service to the public. This includes information regarding the opportunities offered by the public land laws and the procedures for conducting land business with the Bureau. It also includes the maintenance of public land ownership status records and the provision of land ownership status information to other Bureau offices and to other Federal agencies.

Program Schedule

The Bureau's land tenure adjustment program calls for the following action schedule:

1961-1965 Short-Term

During this period principal efforts will be directed toward:

1. Completing the conversion of the Bureau lands program to a controlled operation.
2. Training the staff organization to a level capable of aggressively meeting the demands brought about by increased utilization of public lands.

3. Identifying, classifying, and completing any tenure arrangements necessary to stabilize the ownership status of currently known, highly important public recreational areas.

1966-1980 Mid-Term

All of the land now thought to need investigation looking toward land tenure adjustment or stabilization will be investigated, and the indicated land tenure arrangements will be completed during this period. It is estimated that a total of approximately 40 million acres, or approximately 20 percent of the unreserved public land in 11 western States will be included in this investigation. A much smaller percentage of the Alaska public domain will be involved.

During this period, high priority will be given to the investigation of lands having resource attributes indicating recreation and public use.

A concurrent high priority will be assigned to investigations looking toward identification of lands having private ownership as their highest and best use, and which must be expeditiously transferred from public ownership to sustain continued expansion of various economic activities.

Population growth in the public land States is at a fantastic rate and imposes mounting demands upon our public lands and their resources. The growth and development of our western States, in keeping with population needs and the concepts of free enterprise that have been the cornerstone of the Nation's economic growth and strength, create increased demand for transfer of public lands to private ownership. This demand is already felt. In meeting it, effective measures are needed to insure maximum multiple use development and utilization of the lands and their resources and the proper balancing of the public and private interest factors involved. Steps taken or required to formulate an effective, overall plan for meeting present and emerging problems include the following:

1. At the Department's request, legislation has been introduced which, if enacted, would permit sale by public auction of public lands in tracts of 1,280 acres or less which have been classified as chiefly valuable for urban, commercial, or industrial purposes. It would also permit local government agencies to obtain such lands at their fair market value. This legislation is referred to as the Public Land Urban and Business Sites Act.

2. Pending the enactment of any new legislation, programs based on existing laws will be administered under safeguards of the Department's public land antispeculation policy.

3. Study by a representative public commission to provide the basis for necessary action aimed at coordinating and simplifying Federal land laws and programs, and insuring their responsiveness to new and changing needs.

Lesser priority will be assigned to investigation of lands on which economic trends are uncertain and on which realistic classification decisions will have to wait economic maturity of the

communities involved. In the meantime, these areas will constitute a reservoir of lands and resources which will be available for appropriate development in the future, either public or private.

1981-2012 Long-Term

During this period public land tenure arrangements achieved during the preceding period and areas not previously investigated will be reviewed on a selective basis to insure that tenure changes are made when the public interest indicates the desirability of such change. It is expected that the principal effort during this period will be directed toward identifying, classifying, and transferring to appropriate ownership, those single use areas which are required for intensive recreational, residential, and industrial purposes.

Alaska Lands Operation

The basic principles pertaining to the other western States will be applicable in Alaska. However, the principal operation in Alaska will be completing the State grant under its Statehood Act, which is expected to take practically all of the land having any foreseeable value in the southeastern and southern portions of the State. This selection program should be completed by 1985. The northern and western portions of the State will have substantial lands activity throughout the entire program period. Taylor Grazing Act classification authority does not apply to Alaska. This program is prepared on the assumption that this type of authority will be extended to Alaska before the long-term period takes effect.

Projected work in the lands activity through the year 2012 is as follows: a rather consistent trend of adjudication and case closures would total 234,000 cases through 1965. The same trend is expected through 1980 to give a cumulative total through 1966-80 of 671,000 cases. Following that period a slightly lower trend would result in some 1,200,000 cases for the period 1981-2012. The total adjudication case closures projected through the year 2012 would approximate 2,107,000 cases.

The classification and investigation of lands cases is expected to increase yearly through 1980. For the period 1961-65 the increase is expected to range from 380,000 acres per year to 1,770,000 acres per year, resulting in a total of 5 million acres for the period. An even higher rate is expected for the years 1966-80 to give a total of 33,755,000 acres for that period. During the years 1981-2012 it is expected that the amount of work done yearly will have returned to about the level of the 1961-65 period. It is expected that by 2012 some 93.6 million acres of land will have been classified. The case closures of lands classified are not anticipated to increase in the annual workload, and by 2012 it is expected to be considerably less. The total classification case closures for 1961-65 will be some 92,000 cases, and under the expected trends the cumulative total through 2012 will be some 691,000 cases.

MINERALS

Our Nation's public domain mineral resources are administered for private development by the Bureau of Land Management. The Bureau also administers the disposition of mineral resources on a major part of the lands acquired by the Government. Disposition of these minerals is accomplished by three distinct methods—location, leasing, and sale.

Location is a system of acquiring possessory rights to minerals through discovery which could involve transferring ownership of both land and minerals to private ownership under the General Mining Law of May 10, 1872. The mining laws are applicable only in the following States: California, Oregon, Washington, Arizona, Nevada, Utah, Idaho, Montana, Wyoming, Colorado, New Mexico, North Dakota, South Dakota, Arkansas, Florida, Louisiana, and Alaska.

Under the leasing method, certain minerals are transferred for private development but the Government retains ownership of the land. On acquired lands, all minerals are subject to the leasing system, but only oil and gas, coal, sodium, phosphate,

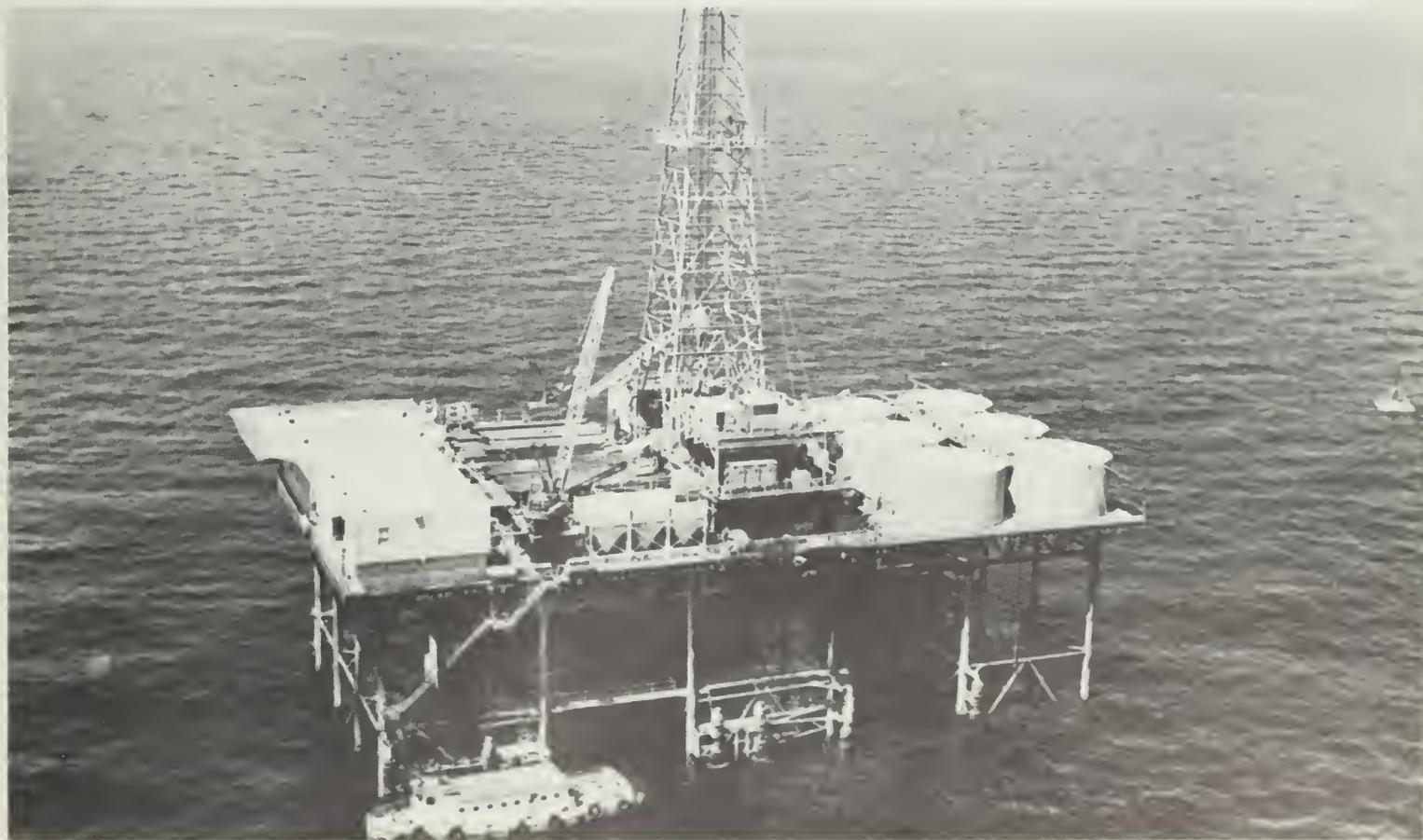
potassium, oil shale, and sulphur in certain States are leased on public lands. Included within the Bureau's administrative responsibility under the leasing system is the vast area of submerged lands known as the Outer Continental Shelf.

Depending upon the character of the lands, the leasing system provides for both noncompetitive and competitive conveyance of oil and gas rights. Either prospecting permits or competitive leases are issued for other minerals, depending on the character of the land.

Particularly since the passage of Public Law 167 (Act of July 23, 1955), another group of minerals, generally referred to as common varieties of sand, stone, gravel, pumice, etc., is supplied into the economy of the Nation through direct sale.

The Bureau has an inherent responsibility to coordinate administration of acts of Congress providing for mineral development with other acts providing for multiple land use. This program is designed to fulfill this responsibility.

THE OUTER CONTINENTAL SHELF. This offshore drilling platform is located in 100 feet of water. Nine wells can be completed on the platform. It has a storage capacity of 12,000 barrels of oil.



With few exceptions, valuable minerals or lands containing such are not subject to conveyance or mineral use under any laws other than the mineral laws. Therefore, mineral or nonmineral land classification is involved in practically every action taken concerning public lands. The Department of the Interior's Geological Survey is responsible for insuring proper classifications relating to leasable minerals. Through coordination with the Geological Survey, BLM is responsible for classifications related to locatable minerals.

Expected Characteristics of Minerals Activity During Program Period

BLM assumes that the Mineral Leasing Act of February 25, 1920, and the related amendments will continue to be the governing legislation for the acquisition of the so-called leasable minerals. Broader general classification criteria of known geologic structures may be established as advances in technology and improvements in techniques are made.

Similarly, it is assumed that the United States Mining Laws of 1872, as amended, will, except for minor modifications, remain

in full force and effect. Modifications such as size and form of locations, simplified patent and survey procedures, and establishment of a type of geophysical or geological claim are probable, but other basic features will remain essentially unaltered.

The term "mineral scarcity" or complete depletion or exhaustion of mineral resources in unrealistic and total exhaustion of mineral resources is not foreseen. Rather, it is assumed that during this program period only high grade favorably located deposits will be exhausted and as these are depleted, less favorable deposits and substitutions will be utilized. Thus, the Nation's problem will be to utilize lower grade materials or substitutions without unduly increasing related costs. Improving technology in both manufacturing and exploration is expected to make this feasible on many areas once thought to have no mineral potential.

The mineral and nonmineral classification of lands will be subject to a continuing review since with increased national mineral demand and improved technology, present uneconomic mineral occurrences will become potentially valuable. Rapidly expanding foreign economies will prevent the ready availability of certain mineral products for import. Classification criteria will be enlarged to prevent gradual dissipation of present un-

MEN AND EQUIPMENT in the continuing search for new petroleum resources.





MODERN underground mechanical loading of ores. Public domain lands contain a large share of America's mineral wealth.

economic mineral occurrences which will become potentially valuable in the future. A public land mineral resource inventory project on a long range basis will be initiated by 1965 to facilitate such classification. This will be coordinated with the Geological Survey.

A significant increase, beginning about 1970, is indicated in the demand for atomic fuels, and the public land States contain the major portion of the present uranium reserves and potential areas for future exploration. By 1970, contemplated research programs in coal technology are expected to develop new markets for both fuel and byproduct consumption, which will have a direct bearing on coal leasing activities thereafter. Sodium borates will be in special demand for their use in the manufacture of exotic fuels for rocket propulsion.

Processing oil shale on a competitive basis with petroleum production will undoubtedly lead to leasing large acreages of oil shale lands when demand for such leasing will bring about modification of existing oil shale withdrawals. Although atomic fuels will supplant other minerals to some extent, petroleum and natural gas consumption will continue to increase. Demands for petroleum will increase at the rate of 3 to 5 percent per year, and industry predictions (*World Petroleum*, June 1959) indicate that demand will increase 60 percent by 1967. Petroleum prod-

uces from BLM administered mineral lands account for approximately 9 percent of total national production. The number of wells per acre is considerably less in the public land States than the national average. Numerous potential horizons exist within the area which are just beginning to be explored.

Ore deposits are not haphazard or accidental in occurrence but are the result of certain natural reactions. As the processes that lead to the formation of an ore deposit are fairly well known, places where deposits might have formed in the past can be recognized. It is possible to point out broad areas most likely to contain ore and areas that are not generally favorable. The western States and Alaska contain major metallogenetic provinces in which only the more obvious areas have been patented. This area of our Nation, which includes substantial acreages of public land, will remain the "breadbasket" of the future for certain minerals, both metallic and industrial. In the large expanse of sedimentary basins of the western States and Alaska, greater concentration of exploration (where depths to the basement rocks average 10,000 feet) will provide for a proportionate increase in the demand for mineral fuels.

The Bureau's minerals activity is directed toward two basic functions, adjudication and classification.

Minerals Adjudication

This activity consists principally of adjudicating the rights of individual applicants in accordance with their applications and applicable law. It includes all action from filing of an application or entry to the issuance or rejection of a lease, permit, mineral material contract, or patent. Involved in this processing is the collection of fees, bonuses, rentals, and royalties. Particularly under the various mineral leasing acts, this agency is one of the Government's leading revenue producers.

Mineral lease income amounted to 70 percent of the Bureau's total in 1959 and is expected to account for 75 percent by 1980.

The supply and demand factors of the Nation's mineral economy, particularly for Mineral Leasing Act minerals, directly influence the workload expected under this activity.

The Bureau program contemplates effort sufficient to meet this workload on essentially a current basis. Completion of records revision and partial system of processing automation by 1970 should enable this activity to maintain an expanding level of operations consistent with public needs.

This activity also includes dissemination of information to the public regarding the opportunities offered by the mineral laws and the procedures for conducting mineral business with the Bureau. The official Government record of public land ownership and tenure status is maintained in cooperation with the lands function.

Mineral Classification and Investigation

This activity includes examinations and investigations relating to compliance with mineral laws. Examinations are made to determine mineral classification of lands, to appraise mineral resources, and to analyze mineral characteristics of resource management or land tenure arrangement programs. In addition, examinations and investigations are completed for other Government agencies on a reimbursable basis; these, which amounted to approximately 25 percent of classification activity in 1959, will be integrated into Bureau programs by 1965.

With the ever-increasing demands being made on the public

WILDCAT OIL DRILLING operations near Jackson Hole, Wyo.



land resources, the problems of optimum use of lands involving mineral or potential mineral resources must be analyzed in advance to prevent unnecessary delays in our overall public land resource usage. Congressional desire, in this respect, is demonstrated by the passage of the multiple use acts, the Taylor Grazing Act, along with Public Laws 585 (1954), 167 (1955), 357 (1955), 359 (1955), and 337 (1958).

The goal for classification and investigation activity will be two-fold. First, individual land examination and classification actions based on mineral patent applications or title transfer requests will be completed on a current basis.

Second, area mineral classifications will be completed to provide availability of currently valuable mineral resources as well as presently unfavorable mineral occurrences for expanding demands as these occurrences become potentially valuable. In cooperation with the Geological Survey, the Bureau will initiate long-range mineral resource inventories on Federal lands in order to prevent gradual dissipation of these resources. Such inventories will consider areas within the national forests. This goal will be accomplished in two phases—preliminary study and analysis to be

completed by 1970, and detailed analysis to be made periodically thereafter.

The adjudication of minerals cases per year are expected to have a small upward trend from 160,000 cases in 1961 to 170,000 cases in 1965 resulting in a cumulative total of 833,000 cases for that period. By 1980, the annual rate of adjudication is expected to reach 265,000 cases per year and to continue this increasing trend to a level of some 462,000 cases per year by 2012. The total mineral cases to be adjudicated from 1961 to 2012 is estimated to be some 15,752,000 cases.

The classification and investigation work projected for the minerals program is based on acres investigated and individual cases from public demand. The estimated trends for both types of work are quite similar. It is expected that the Bureau will investigate and classify 14,650,000 acres by 1965. The annual rate of increase in this work will about double through 1980, and again by 2012 to result in a total of 316,560,000 acres classified from 1961–2012. Concurrently the number of cases classified because of public demand will reach a total of 797,000 through 2012.

MODERN PETROLEUM REFINERIES such as the one above process vast quantities of oil and natural gas from Our Public Lands.





GOOD RANGE MANAGEMENT perpetuates natural watershed, recreation, forest, and grazing resource values for future generations.

RANGE MANAGEMENT

The Bureau of Land Management has a conservation responsibility for the proper management, protection, and improvement of the grazing resources on the public lands it administers. The range management program is designed to prevent forage and soil deterioration, to provide for their rehabilitation and orderly use, to stabilize the livestock industry dependent upon the public range, to contribute to the propagation and management of wildlife, to insure access to the public lands for timber harvests, mining, recreation, and for other lawful purposes.

In addition to administration of the use of forage on the public lands, the Bureau seeks betterment of that resource through its soil and moisture conservation, range improvement, and weed control programs. These are coordinated with the lands, minerals, forestry, and engineering functions of the Bureau, and the programs of other cooperating agencies and landowners.

Grazing Administration

The goal of grazing administration is the development of the public range lands to their highest production potential and use consistent with sustained yield principles and good conservation practices. The long-range program provides for the strengthening of the grazing administration organization concurrently with the acceleration of protection, conservation, and improvement activities to maintain organizational balance and insure the services and supervision necessary to the achievement of the Bureau's conservation and management goals. The relative importance and magnitude of the nine elements of the grazing administration activity are described below.

1. Administrative operations include billings, lease and license records, management improvement, public relations, reports, work

programming, accounts, and similar activities. The goal is to maintain peak efficiency in this phase of work which is essential to proper range management.

2. The adjudication and adjustment of grazing privileges involve the equitable apportionment of available Federal range in established grazing districts among competing applicants for the use of the range, based on qualifications defined by administrative regulations, and the periodic adjustment of permitted grazing use resulting from changes in available forage or the qualifications of applicants. Basic adjudications of grazing privileges and adjustments in range use are to be completed by fiscal year 1968. Thereafter, adjustments will be made to allow for changes in land tenure and increases in available forage. Land tenure adjustments are expected to reduce the acreage of public lands available for grazing in the western United States from 174 million acres in 1960 to 168 million acres by 1980, and to 164 million acres by 2012. This reduction of 10 million acres will be offset to some extent by restoration of withdrawn lands. It is also estimated that livestock grazing in Alaska will bring into productive use several millions of acres of grazing lands not now being grazed.

The forage available on public lands in 1960—exclusive of

Alaska—is estimated at 17 million animal-unit-months. As a result of intensified range management and accelerated range conservation and improvement programs, it is estimated that the available forage will have increased to 29 million animal-unit-months by 1980 and to 46 million animal-unit-months by the year 2012. These increases will result in the modification of many existing permits and the issuance of permits to new applicants who are not presently users of the Federal range. Because of these necessary actions, a continual adjustment program will be required.

3. Grazing lease administration applies to tracts of public lands situated outside of established grazing districts which are leased for grazing purposes. During 1959 there were 10,400 such leases in effect. The activation of a program of land tenure adjustments will result in title transfers affecting a large number of the scattered tracts of public lands. The number of leases is expected to decrease by 1980 to approximately 8,000 and by the year 2012 to about 5,000. Problems related to the termination or modification of leases and reimbursement for improvements are expected to maintain a fairly constant work load in grazing lease administration throughout the period of the long-range program.

4. Range use supervision includes the inspection, supervision,

RANGE SEEDING. Available forage for livestock and big game can be increased as much as ten times, and soil and water losses greatly reduced by range seeding.



and policing of the public land grazing use to control trespass and insure compliance with the management and utilization provisions of grazing permits and leases. As the range conservation and improvement programs move forward and grazing use increases, more supervision of range use will be required to achieve the objectives and benefits of more intensive scientific range management and conservation practices.

5. Wildlife and recreation activities embrace technical operations carried out independently by the Bureau and in cooperation with other agencies in furtherance of wildlife propagation and management including habitat improvement. The demands for recreation from ever-increasing numbers of people will result in steadily expanding recreation programs on the public lands. Wildlife populations are expected to increase over much of the public land areas as a direct result of widespread water development, habitat improvement resulting from increased forage production on critical seasonal ranges, and better game management. Big game use in 1960 is estimated to be approximately 15 percent of the available forage on public lands. As forage production is increased on public lands, use adjustments to provide better balance between seasonal ranges will permit increases in big game

numbers at a rate proportionate to the amount and rate of forage increases. This will permit present and future generations to enjoy their heritage of natural resources, and also will provide for an increasing annual harvest of game animals. Under the general leadership of the National Outdoor Recreation Resources Review Commission, the Bureau cooperates with its sister agencies—Fish and Wildlife Service, National Park Service, and the Bureau of Reclamation—as well as other Federal and State agencies in properly managing wildlife, water, and recreational values of the public lands.

6. Range resource surveys provide basic inventories of vegetation suitable for grazing use, range site potentials, vegetative type descriptions, information on the distribution of water, cultural developments, topography, needed range conservation treatment, and range improvements. Range management plans based on this information are employed to rehabilitate depleted ranges and provide for their future use on an orderly, sustained yield basis. Approximately one-half of the public lands have been covered by resource surveys up to 1960. The remaining surveys are scheduled for completion by 1967 to provide information needed to complete the range adjudication program by 1968 and from which to de-

RESERVOIRS impound seasonal runoff and aid in the proper distribution of livestock and game use, increasing production. They also provide a source of water for the suppression of range and forest fires.



velop sound management, conservation, and improvement programs. Resurveys will be required from time to time as a basis for management adjustments in the future. Provision for such surveys is made throughout the long range program.

7. Dependent property surveys provide basic inventories of individual ranch units, including land and water, to establish a record of ownership or control, forage crop production, current and prior use of the Federal range in connection with the base property, and other information necessary for a determination of base property qualifications and year-round livestock operations as defined by the regulations. Approximately 70 percent of the base property which supports grazing permits issued to 18,185 permittees during 1959, has been covered by dependent property surveys. As a preliminary step toward completion of the adjudication of grazing privileges, the remaining lands will be examined and all prior survey reports reviewed and brought up to date by 1968.

After that time periodic checks will be made to appraise compliance with base property requirements, and to make necessary adjustments resulting from the transfer of ownership of base property, failure to comply with the regulations, waivers of permits,

and other record adjustments required to maintain dependent property records on a current and accurate basis. As the amount of available forage increases, new applications for grazing permits will be received requiring additional dependent property surveys on ranch properties not previously examined.

8. Range studies are made to determine applicable techniques and practices which will most effectively meet the natural requirements of soils and vegetation under proper management and use. Studies to guide the manipulation of vegetation for the improvement of wildlife habitat, and the evaluation of the effectiveness of range management, conservation treatment, and improvement practices are examples of range studies to be conducted. Such studies may be made by the Bureau or carried out in cooperation with other Federal, State or private research or management agencies. It is planned to select typical public range allotments in each grazing district on which to test management techniques, and cooperative experimental ranges will be established in each of the Western range States on which to conduct long range management studies.

9. Range condition and trend studies will be conducted to determine the long-term effectiveness of range management programs

WATERSPREADING is an effective means of controlling erosion. Floodwaters are diverted from stream channels and spread over adjacent flood plains by means of dikes. Grasses are seeded behind the dikes to utilize excess water and increase forage supplies.





BRUSH CONTROL. Millions of acres of depleted range lands can be restored by removing low-value plants and seeding with valuable forage grasses. Since 1934, the Bureau of Land Management has successfully seeded 2,411,000 acres of public range lands.

AERIAL SPRAYING. Range lands too rough for cultivation often can be improved by use of chemical sprays. Aerial eradication of big sagebrush to rehabilitate native or speeded species costs about \$3 per acre. Careful timing and selective sprays reduce damage to other shrub species. Since 1934, the Bureau of Land Management has completed 1,394,400 acres of brush control.



and to ascertain needed adjustments in management practices. It is planned that the entire acreage of the Federal range will be covered by extensive range condition and trend surveys every 5 years. Permanent transects and study plots will be established in grazing allotments and representative range types to measure changes in vegetative cover.

Soil and Moisture Conservation

The Bureau of Land Management applies the soil and moisture conservation program of the Department of the Interior to the public lands. The general objectives of the program are the control of soil erosion and water losses, and the stabilization of forest and range watersheds to assure continued availability of water for domestic use, livestock, irrigation, power generation, and industry. In numerous instances the Bureau of Land Management has demonstrated the feasibility of judiciously harvesting

timber on municipal watersheds and in drainages tributary to irrigation reservoirs. While flowing toward its ultimate uses, the water on Bureau lands serves as the habitat for fish and waterfowl which provide recreational diversion for the expanding populace.

Specific soil and moisture conservation objectives are:

1. To use the public lands in accordance with their optimum capabilities.
2. To apply treatment to the lands in accordance with their needs.
3. To control surface runoff to promote water intake for plant use, to sustain ground water levels, and to minimize soil erosion and downstream flood and silt damage.
4. To restore depleted range lands to optimum productivity.

The soil and moisture conservation program is closely coordinated with forest and range management to assure proper use and protection of treated lands. The short range program pro-

NATURAL SPRINGS and seeps can be developed to make better use of limited water supplies. The Bureau of Land Management has completed 3,424 spring developments since 1934.



vides for a rapid build-up in conservation treatment which will continue through 1980. After 1980, construction and land treatment work will decline and maintenance and replacement will increase. The soil and moisture conservation program will play a major role in the rehabilitation and development of the soil and water resources of the public lands to meet future resource needs.

Water management accomplishments are measured by the numbers of detention dams, reservoirs, springs and wells to be completed. Detention dams are key structures in the control of water runoff and the reduction of downstream erosion damage. Other types of runoff and erosion control structures are dependent upon detention dams. Reservoirs impound flood waters to reduce erosion damage and to provide water for livestock. Springs and wells are primarily range use facilities which contribute to proper range management and conservation.

Proposed fencing will further divide the public lands into management areas and allotments and protect range seedings and other land treatment from overuse.

Range seedings will improve millions of acres of range lands now occupied by low-value shrubs. By use of chemical sprays and other methods, present cover can be converted to vegetation having higher values for livestock and big game forage and for soil protection. Range seedings are used to convert low-value vegetation and denuded areas to valuable grazing lands. Forage production on millions of acres of Western range lands can be increased as much as 10 times, and soil and water losses materially reduced by range seeding practices.

Weed Control

Depleted ranges contribute to the spread of noxious and poisonous weeds. Large areas in the West have become infested with halogeton, a poisonous annual plant. Other areas are infested with weeds which serve as host plants for insects injurious to important agricultural crops on adjacent farm lands. The objective of the weed-control program is to eliminate or reduce the occurrence of such weeds to prevent livestock, wildlife, and crop losses. Chemical sprays are used along roadways and similar areas, and range revegetation practices are applied on open range lands. As the rehabilitation program advances, the need for weed control funds will become less. The long-range program provides for substantial weed control activity through 1980, after which time this work will be progressively reduced.

Range Improvements

Twenty-five percent of all grazing receipts are returned to the Bureau of Land Management to be expended for the con-

struction, maintenance, and purchase of range improvements on the public lands. These funds are expended largely for the construction of range facilities used directly in support of the grazing administration activity and for the maintenance of structures completed in prior years. Increased grazing capacity and range use fees are expected to result in progressively higher receipts and returns for range improvements.

Range users and others contribute to the range conservation and improvement programs of the Bureau. Such contributions usually total from 25 to 35 percent of the total cost of the program. Contributions consist of cash, labor, materials, and the use of equipment. In some instances, the user finances the entire cost of projects completed under permits issued by the Bureau. Substantial contributions are anticipated throughout the long range program period. However, as the Bureau's operating funds increase, the ratio of contributions tends to decrease. Contributions generally are made toward maintenance of those projects of direct benefit to the permittee.

The projected accomplishments in grazing administration have been measured in terms of the number of grazing leases administered and the year-to-year work of the number of leases on which the adjudication and adjustment of grazing privileges will be made. The number of grazing leases administered annually (2,500) is practically constant from year to year. The annual rate of adjudication and adjustment of grazing privileges are more variable. From 1961-65 an upward trend from 4,000 to 5,100 cases per year is anticipated, totaling 22,500 cases for this period. By 1980 the annual trend is expected to have declined to 3,800 cases per year, but it will then increase to 5,200 cases per year by 2012, resulting in 207,900 cases of adjudication through 2012.

Project program accomplishments on the Federal range are principally miles of fencing, acres of range seeding, acres of brush control, and water management projects. The fencing program is expected to increase annually from 1,460 miles in 1961 to 3,645 miles in 1980. After 1980 the annual rate is expected to decrease by about 50 percent. A total of 115,500 miles of fence is expected to be built through 2012.

The annual rate of acres of range seeding will increase from 189,000 acres in 1961 and 434,000 acres in 1965 and then decrease to 215,000 acres per year by 2012, at which time the Bureau will have seeded 12,325,000 acres.

The annual rate of brush control will continually increase from 132,000 acres in 1961 to 651,000 acres in 2012, which will result in a total of 32,283,000 acres treated by 2012.

The water management projects are expected to increase in number annually—from 1,000 in 1961 to 1,425 in 1965, and then decrease to 750 per year in 2012. This will result in 64,600 water management projects by 2012.

FOREST MANAGEMENT

Increasing benefits from intensified management of forested public lands characterize the Bureau's plans for the half-century ahead. Annual cash receipts from sales of timber are expected to increase from a 1959 total of \$32 million to \$60 million by 2012. Contributing to that achievement will be careful husbandry of the resource including timber reinventories; determinations of allowable sustained yield harvesting rates; access acquisition; protection of timber stands from insects, disease, fire, destructive animals, and trespass; road construction and maintenance; prompt reforestation following harvest; and activities which support timber management along with other resource management functions.

Timber Harvests

The Bureau's commercial timber lands produce over a billion board feet of timber annually. In 1959 the total volume of timber harvested was 1.1 billion board feet. The volume to be harvested in 2012 is 1.3 billion board feet, enough to build a gangplank to the moon with lumber left over to house a community of 300 families.

About 46 million acres, or nearly a tenth of the total acreage administered by BLM, is classed as commercial forest land now. Of this total about 2.3 million acres of highly productive commercial timber lands are in western Oregon. The Bureau's commercial timber lands elsewhere are much more extensive and in the aggregate they produce one-fifth the volume of timber harvested annually in western Oregon on BLM lands.

In addition, 114 million acres of forested lands (including piñon-juniper, oak-madrone, subalpine, etc.) are presently classified as non-commercial for timber production. Nevertheless, these woodlands are valuable as watersheds, recreational areas, and wildlife habitat. As the demand for wood grows, with consequently closer utilization, it is anticipated that where economic conditions become favorable, these lands will produce regular crops of wood fiber and other products such as fence posts.

The volume of timber to be sold will increase somewhat until 1965 when maximum production from current management practices will be maintained. The reinventory and computation of the allowable cut was completed in 1959 in western Oregon, and it is anticipated that amounts equal to the allowable cut will be harvested annually in 1960 and thereafter. Inventories of commercial timber lands elsewhere will be completed by about 1965.

Following is a tabulation showing the volumes of timber to be harvested from the revested Oregon and California Railroad grant lands (including the reconveyed Coos Bay Wagon Road grant lands) which are in western Oregon and from other public lands in the Western States (including 240,000 acres in western Oregon which are managed in conjunction with the O & C lands). Actual data are presented through 1959 with program estimates thereafter.



TIMBER HARVEST. Each year the Bureau of Land Management harvests over a billion board feet of timber. Sold at public auction, revenues exceed \$35 million annually and represent the largest source of income, other than oil and gas leases, from the management of the public land resources. Harvesting magnificent stands of Douglas fir in western Oregon like that pictured above requires careful planning to achieve maximum returns. Roads are constructed in the most advantageous locations, maturity and condition of the stands is considered, cutting areas are located to reduce the subsequent likelihood of windfall of bordering trees, and plans for reforestation are made prior to sale.



"TIMBER-R-R! Down the hill!" rings out as a pair of fallers in hard hats make the final cut with a chain saw to drop a huge pine tree marked for harvest by BLM foresters. Mature and high-risk trees—those that are dead-topped, susceptible to insect and disease attack, or of poor vigor and form—are removed selectively from all-aged stands of pines in the semi-arid West where easy terrain allows frequent harvest cuts from the same area. Such cuttings improve the form, quality, and growth rate of the stand. Where stands are even-aged, the best silvicultural practice is to clear-cut blocks which can promptly be reforested with new stands of thrifty, uniform, even-aged trees.

VOLUME OF TIMBER HARVESTS

[Millions of board feet]

Year	PD	O & C	Total
1955	114	645	759
1957	130	625	755
1959	190	902	1,092
1961	187	1,000	1,187
1962	203	996	1,199
1963	238	950	1,188
1964	242	950	1,192
1965	245	1,008	1,253
1980	226	1,008	1,234
2012	248	1,053	1,301

Effective with fiscal year 1960, the allowable annual harvest of timber chargeable against the recent reinventory of O & C forest resources is 874.2 million board feet. That represents the volume of timber which can be annually harvested on a sustained yield basis, assuming a continuation of present economic conditions and forest management and utilization practices. In addition to the allowable cut of mature green timber, harvest estimates include salvable timber which was dead at the time of inventory—either intermingled with green timber stands or merchantable ref-

use left on areas previously logged. Likewise, volumes which can be removed in preharvest cuts without reducing the expected final harvest will be sold in increasing amounts. The volume of merchantable dead material remaining on previously logged areas was reduced to practically nothing during the late 1950's through an aggressive salvage sale program. The demand for material removed in preharvest sales is increasing, but the volume obtained from that source will not be sufficient to equal the previous salvage volumes until about 1965.

Also by that time it is anticipated that inventories on the rest of the Bureau's commercial timberlands can be completed and a more precise estimate of the sustained yield allowable cut determined. Meanwhile, the volumes to be harvested from unreserved public domain are governed largely by the availability of foresters but are expected to increase from 190 million board feet in 1959 to the present estimate of the allowable cut—245 million board feet—in 1965.

Classification of some public domain forest lands for sale by 1980 will result in the reduction of timber harvests, but this will be offset by 2012 through increased harvests per acre. These

increases will be due to better stocked stands, yields from intermediate thinnings, the availability of better genetic strains, more prompt regeneration, and closer utilization.

Cash receipts from the sale of BLM timber have increased from less than \$8 million in 1951 to more than four times that amount in 1959. Receipts are expected to increase further with intensified management, and in 1965 will exceed \$41 million, not including receipts by the Forest Service for the sale of timber from the 492,418 acres of O&C land administered by that agency.

The average price per thousand board feet paid for standing timber sold by the Bureau in 1959 was \$29.95. In 1961, the average is expected to be \$32.15.

While the income from the sale of standing timber contributes greatly to the public income, the total effect on the economy is much greater. Harvest, transportation, manufacture, remanufacture, and merchandising all are based on the productive capacity of the land and the utility of its resources. According to an analysis by the Pacific Northwest Forest and Range Experiment Station, approximately twelve man-years of work are required to transform standing trees into a million board feet of

forest products. Thus, it is tremendously desirable to keep every acre of commercial timber land fully productive and for the Bureau to employ sufficient professional foresters to make possible the regular harvest of the full sustained yield allowable cut while simultaneously fulfilling all other multiple use resource management responsibilities.

The 1959 receipts from the sale of BLM timber (which amounted to \$31,850,860) represented 23 percent of the total Bureau receipts. Timber receipts were exceeded only by those from oil and gas rentals and royalties, which in 1959 accounted for 70 percent of the Bureau total of \$136,720,871.

Receipts from the sale of timber far exceed the cost of timber management. In 1961 when 1.2 billion board feet of timber are to be sold at an estimated price of \$38 million, the direct cost of timber management is expected to be \$3.5 million, not including funds made available by the western Oregon counties for road construction and maintenance, reforestation, and the provision of recreational facilities. The counties currently allocate one-third of their receipts from O & C resources for those purposes.

The demand for wood, according to most projections, is ex-

LUMBER GRADING. Bureau of Land Management foresters grade lumber and tally the quantities of each grade recovered from logs of specified qualities. This provides a direct correlation between log grades in standing trees and the value of the lumber produced. In determining the minimum acceptable prices foresters determine the board foot and grade content of standing trees to be offered for bid. Appraisal data is constantly improved to reflect changes in utilization, logging equipment, road construction and transportation costs, and all other factors affecting the value of products resulting from the primary manufacture of timber.





BLOCK CUTTING. Management of even-aged timber stands calls for harvest of mature blocks of timber with prompt regeneration. Three age classes are represented in the above photo: a stand of 20-year-old trees established after a previous harvest; an area which was recently logged, with young trees seeking ascendancy over competing brush; and a mature stand ready for harvest.

REFORESTATION. 33,000 acres of productive timber land were reforested in western Oregon in 1959. However, a backlog several times that large of nonstocked or poorly stocked lands should be restored to full production as promptly as funds and techniques permit to insure the maximum return from public resources. In suitable situations Douglas fir seed can be aurally distributed by helicopter. In other cases, 2-year-old trees are planted by hand. Sometimes tree seeds are planted in the ground, like beans. In the above photo, Boy Scouts are cooperating with the Bureau of Land Management in a conservation project which will provide mature trees a century hence.



pected to increase with the increase in population. However, according to U.S. Department of Agriculture Forest Resource Report No. 14 of January 1958, per capita demand for lumber and fuelwood by 2012 is expected to decline, although increases in demand for products manufactured from pulpwood is expected to show a substantial per capita increase. These changes in demand indicate that lodgepole pine in the Rocky Mountain region and spruce in interior Alaska as well as other presently non-merchantable species will become valuable enough to insure their future use for fiber production. Compared with the present United States consumption of about 16 billion cubic feet of wood, by 2012 consumption is expected to be twice that amount, based on a projection of data for 2000, contained in Forest Resource Report No. 14.

The increasing demand for wood, coupled with the transition from pioneer life, indicates that granting of free use of timber from Federal lands to local residents for house logs, fence posts, fuel, etc., will probably decline in future years. Such products authorized for removal from BLM lands during fiscal year 1958 were appraised at \$20,648.00.

Reforestation

The Bureau inaugurated a reforestation program of considerable magnitude in 1952. It will be expanded until the current backlog of non-stocked or inadequately stocked commercial timber land is back in full production. This calls for the artificial reforestation by helicopter seeding and by tree and seed planting of from 19 to 42 thousand acres a year. If natural regeneration

cannot be expected to succeed immediately following logging, plans are made to seed or plant the area promptly to prevent brush encroachment.

TIMBER LAND SITE IMPROVEMENT AND REFORESTATION, 1955-2012

Year	Vacant public lands		O & C lands		Total	
	Site improvement, acres	Reforestation, acres	Site improvement, acres	Reforestation, acres	Site improvement, acres	Reforestation, acres
1955.....				4, 513		4, 513
1957.....				4, 636		4, 636
1959.....		201	2, 073	33, 350	2, 073	33, 551
1961.....	550	1, 450	4, 750	17, 600	5, 300	19, 050
1963.....	4, 805	7, 920	3, 300	25, 000	8, 105	32, 920
1965.....	11, 910	16, 870	3, 300	25, 000	15, 210	41, 870
1980.....	8, 180	11, 270	1, 500	16, 800	9, 680	24, 980
2012.....	5, 850	210, 295	1, 500	16, 800	7, 350	227, 095

Many thousands of acres which were burned repeatedly, or on which brush or ferns became established to the exclusion of new timber crops, will require site improvement treatment prior to reforestation. This may involve snag falling, mechanical scarification on areas where the slopes are not too steep, or the use of herbicides. The Bureau, in a cooperative study with Oregon State University, is determining the most effective chemicals and application techniques for the control of undesirable plant species on areas to be reforested. Treatment of as much as 15,000 acres per year is expected to be necessary to facilitate reforestation.

The Bureau is also embarking on pre-commercial stand improvement measures to enable the production of maximum crops of trees having the most desirable qualities.

TIMBER SALVAGE OPERATIONS. When fires occur, every attempt is made to promptly salvage all merchantable material before further deterioration from insect and disease attack becomes severe. Unmerchantable snags are felled and reforestation measures undertaken. Areas logged years ago or subjected to repeated burns often have developed a dense brush cover which must be removed mechanically or through herbicide treatment before they can be successfully planted or seeded.





RANGE FIRES are combated with powerful pumper trucks which direct water on the flames. The Bureau of Land Management is organized during periods of fire hazard to protect the public lands—99 percent by Bureau personnel, the remainder by contracts with State fire control organization and with the Forest Service.

PROTECTION OF PUBLIC LANDS

Protection of the public lands from trespass, fire, insects, diseases, animals, and even the vagaries of weather is a responsibility of the Bureau which requires vigilance, preparation, and continuing effort. With a resource valued in billions of dollars—one that is susceptible to many kinds of damage, but that produces many millions of dollars of income annually if carefully managed—adequate protection is essential. Mice, bark beetles, windstorms, deer, root rots, lightning and other natural elements cause staggering damage to timber crops. Of great importance also is the damage caused to forests by the carelessness or willfulness of man in starting forest and range fires or committing trespasses.

Trespass Control

Trespasses affecting lands administered by BLM can be classified as fire, timber cutting, occupancy, road use, agricultural, grazing, material removal, and others.

To augment recently expanding efforts to control timber cutting trespasses, considerably more effort to control all types of trespass is planned during the years immediately ahead. This program includes the prompt determination of damages in all

pending or suspected trespass cases, collection, and settlement, plus acquainting the public with trespass regulations, and a continuing program to identify the corners and boundaries of the public lands. These lands are particularly susceptible to trespass because of their scattered pattern. For example, the 2.3 million acres administered by BLM in the 5 western Oregon districts are comprised of 6,000 separate parcels having combined boundaries of 15,000 miles, few of which are adequately marked on the ground. The expanding cadastral engineering program is essential to relocate lost corners, remonument existent corners, and mark boundary lines. When that is accomplished, the number of casual or involuntary trespasses will be greatly reduced.

The availability of sufficient manpower to eliminate present trespass backlogs and permit immediate action on all suspected trespassers as soon as they are discovered also will tend to deter potential trespassers. Better acquaintance with applicable trespass laws and regulations also will deter potential trespassers.

Fire Control

Five million acres of BLM lands are protected against the ravages of fire through contacts with State fire control organiza-

tions. Similarly, another 700,000 acres of BLM lands adjacent to national forests receive protection against fire in accordance with a memorandum of understanding between the Departments of the Interior and Agriculture. The remaining public lands (99 percent of the total) are protected directly by the Bureau of Land Management with its own personnel and equipment. In addition, the Bureau, by contract, expects to continue protecting lands selected by the State of Alaska until 1980, when the State lands will be sufficiently consolidated to justify a separate fire control organization responsible for the more than 100 million acres of State and private lands.

With the anticipated consolidation of public lands and with the assumption of fire control responsibilities on the resulting consolidated blocks by the Bureau itself, it is anticipated that the acreage of BLM lands protected by contract will decline to less than 1 million acres of public domain land and 2 million acres of O & C land.

Most of the BLM lands in western Oregon, totaling about 2.3 million acres, will continue to receive contract protection because they are intermingled with lands receiving protection by the State of Oregon.

To achieve more nearly adequate control of forest and range fires on lands protected by Bureau personnel, plans for the next five years emphasize the need for a well-trained fire control organization, the expansion of detection and communication facilities, and the acquisition of sufficient equipment inventories to cope with anticipated requirements.

Long-term goals are premised on the likelihood of increased fire danger resulting from greater public recreational use. Another factor increasing the fire hazard on range lands will be the greater volume of fuels resulting from less over-grazing and from range revegetation. The protection of investments in range improvements is an economic necessity, just as is the protection of watershed, timber, and recreational values.

In Alaska the Bureau will protect about 225 million acres of State and BLM forest land until 1980 when that total will drop to 120 million acres as the State assumes its own protection responsibility.

The fire control program in Alaska exemplifies the Bureau's use of the latest techniques developed cooperatively by professional foresters and fire control specialists in public and private agencies throughout the country. Chemical retardants are dropped from

FIRE LINE. Construction of fire lines with hand tools often is necessary in spite of modern developments in fire control equipment. It is hot, dirty, disagreeable work. All fire suppression activities are costly. Never more true was the observation, "An ounce of prevention is worth a pound of cure."



airplanes, smokejumpers parachute to attack fires detected by fast-flying patrol planes, power pumps and saws are used, the fire boss directs control by radio from helicopters, crews are transported by amphibian planes, and other recent developments are employed to combat fires that would burn literally millions of acres if unchecked. But even the improved control measures of recent years may become obsolete with weather modifications, aircraft that travel with great speed horizontally, that take off and land vertically, mechanized line building equipment that can be airlifted, perhaps detection by radar, and even more fantastic developments.

To secure the degree of protection from fire in Alaska that will permit the regrowth of previously burned forests in time to supply the increasing demand for pulpwood will require an investment in fire control buildings and facilities totaling over \$3 million by 1980. Maintenance costs are estimated to increase from \$8,500 per year in 1960 to \$95,000 per year in 1980.

In the past decade, notable accomplishments have been made in creating an awareness in the public of the losses caused by uncontrolled fires. The Bureau plans to continue its cooperation with all private and public agencies in preventing man-caused forest and range fires.

Protection From Other Damage

Lightning fires on forest and range lands are dramatic examples of damage caused by the elements, but also of great importance is

timber damage caused by windthrow, snow breakage, and drought. By applying appropriate silvicultural practices, these losses can be reduced. The use of tree and forage species that are best adapted naturally and the development of hybrids or genetic strains with suitable characteristics also will be of value in securing the greatest production from every acre of land.

Wild animals such as mice, porcupine, bear, elk, deer, rabbits, and wood rats cause large amounts of damage annually, primarily in hampering reforestation. Domestic livestock sometimes also cause reforestation damage if not properly managed. The Bureau's cooperation with other public and private agencies has been effective in finding a means for protectively treating Douglas fir seed to lessen damage by mice and to make reseeding by helicopter a practical method of reforestation. Measures also are taken to reduce rodent damage to range lands. This is a joint effort between BLM and the Bureau of Sport Fisheries and Wildlife.

Endemic insect populations cause little-realized amounts of damage to forage and timber, as do wood decay fungi and other diseases such as the white pine blister rust. The Bureau encourages needed research, chiefly the responsibility of the Department of Agriculture, on the control of these damaging agents and takes prompt action to control epidemic attacks or to salvage damaged timber when control is impossible. The use of antibiotics in the control of white pine blister rust may presage a new era in disease control.

THE OLD AND NEW in fire control, a Ford tri-motor airplane—tough relic of the early days of flying—drops borate slurry on a fire burning near Boise, Idaho. The use of air-dropped fire retardants is a relatively recent development in the control of fires.





AERIAL FIRE FIGHTING. Workhorse of Alaskan fire control is the amphibian, twin-engined Goose, here being boarded by a crew for dispatch to a fire. The Goose carries about 10 firefighters, their tools, and bedrolls. Provisions in the form of dehydrated combat rations, supplemented by fresh bread and steak are air-dropped. Because of the abundance of small lakes, the plane usually can land within a mile or two of fires in the lower elevations. Smokejumpers are dropped to small, less accessible fires.

WATER from the mountain streams originating on public lands is vital for irrigation, livestock, power generation, domestic and industrial use and is also a valuable asset to those seeking outdoor recreation. Careful regulation of compatible uses of all resources provides sustained benefits including continuous flows of water, forage for livestock and big game, successive timber crops, conservative use of minerals, and unlimited opportunity for recreation.





HUGE TRUCKLOADS OF LOGS harvested from Bureau timber lands move to market to help supply the increasing demand for wood products. During the next half-century United States wood requirements are expected to increase from 16 to 32 billion cubic feet. The costs of road construction are recovered in the sale of timber which brings a higher price per thousand board feet when roads are available for the use of timber purchasers. Fees are collected when private timber is hauled on Bureau roads.

ACCESS

The Bureau provides roads which can be used for all resource management purposes, including timber harvest and timber sale contract administration, fire control, reforestation, and use by the general public for recreational activities.

For example, all purchasers of BLM timber are guaranteed equal opportunity of access to the cutting area and the right to transport forest products therefrom. In many cases, public roads are adjacent to or traverse the Bureau tract from which the timber is sold. In other cases, the Bureau purchases easements for roads or rights-of-way on private lands across which it is most practical to reach public roads and markets. Sometimes reciprocal use agreements with owners of intermingled lands are a suitable means for providing joint access. All of these methods are employed to assure equal access to prospective purchasers of Bureau timber.

Similarly, the Bureau cooperates with owners of private lands who wish to construct new roads or use existing roads on Bureau lands to transport forest products from adjacent private lands. Permits are issued for that type of use.

Because of the frequent complexity of the land ownership pattern, it is necessary to process hundreds of cases annually which involve granting or receiving rights for the use of logging

roads. The tabulation below shows estimates of the numbers of access cases which must be processed to assure proper management of Bureau lands and those with which they are intermingled.

ACCESS CASES PROCESSED GRANTING AND RECEIVING RIGHTS TO TRANSPORT FOREST PRODUCTS

<i>Year</i>	<i>Cases</i>
1961-----	1, 100
1962-----	1, 200
1963-----	1, 300
1964-----	1, 400
1965-----	1, 500
1980-----	1, 600
2012-----	900

Total 1961-2012----- 65, 000

The time required to process a case varies from several hours to several months, or even years in extremely complex situations. Processing the more than 65,000 access cases necessary prior to 2012 is expected to require 2,300 man-years of effort and perhaps even more.

ROAD CONSTRUCTION AND MAINTENANCE

Basic to adequate management of the public lands and resources is the availability of suitable road systems. Roads are needed to transport forest products from woods to market, to move livestock by truck, to facilitate recreational use by the public, and for use in other resource management and protection activities.

Many temporary spur roads used for transporting forest products from sale areas to permanent mainline roads are constructed and maintained by timber purchasers and right-of-way permittees. In addition, substantial mileages of permanent roads are also constructed and maintained by the users. It frequently is desirable, however, for the Bureau to build and maintain roads on public lands or on other lands where easements or right-of-way agreements have been obtained. This is necessary where initial road building costs are large due to length or difficult terrain and cannot be financed by timber sale purchasers. In other instances, permanent roads may be necessary to reach immature stands of timber for either commercial or non-commercial thin-

nings at successive intervals. Permanent roads also are needed to afford access for protection and management and to facilitate public recreational use of Bureau lands.

In 1961 the Bureau plans to construct new roads and purchase rights-of-way as well as some existing private roads (not including roads constructed by timber purchasers and right-of-way permittees) which are estimated to cost \$8,478,000.

By 1965, the direct costs of roads and rights-of-way is expected to reach \$8,802,000, with a total for the 5-year period of \$42,472,000. Annual expenditures are expected to decline to \$8,268,000 by 1980 and to drop still further by 2012 to \$3,879,000 when most mainline roads within the more nearly stabilized public land pattern will have been completed. Bureau roads are built to standards which result in transportation and maintenance costs commensurate with the volume of use they will receive and the cost of maintenance.

By 1965 it is anticipated that the Bureau will maintain 4,600 miles of permanent roads, 3,000 miles of which will be by contract

ROAD CONSTRUCTION. Access to BLM lands is vital to resource management and protection activities. Heavy equipment is pictured above during the construction of a permanent mainline road which will be used to transport timber harvested from mature stands in western Oregon. Roads are also needed to provide prompt transportation of firefighting crews, to reach areas to be reforested or thinned, and to facilitate recreational use of the public lands.





and the remainder by BLM personnel. In addition, most roads being used by timber purchasers and right-of-way permittees will be maintained by them according to Bureau standards.

Cost of maintenance for 1965 is estimated to be \$690,400, which is about 2½ times the amount required in 1961. Maintenance costs in 1980 are estimated to be \$2,394,000, and in 2012 will be \$4,019,000.

Temporary roads required for individual timber sales but not necessary for permanent use are restored to production at once. Measures are taken to prevent erosion on all such roads.

Construction and Maintenance of Buildings and Other Facilities

During the period from 1961 through 1965 it will be necessary to construct 148 buildings and other facilities where they are not available by lease. These structures include district office buildings in small towns, equipment sheds, warehouses, fire crew stations, fire lookout towers, radio repeater stations, fire retardant mixing stations, and similar facilities needed to efficiently carry out the Bureau's work and protect public property.

With land pattern adjustments, it will become necessary to shift work locations for most efficient operations. Consequently, a modest building construction program is expected to continue for several decades.

Maintenance of all structures in good repair is essential to economical operation. By 1965 there will be 306 buildings and other facilities requiring maintenance. Direct maintenance costs for that year are estimated to be \$329,000.

ADEQUATE MAINTENANCE of permanent roads on Bureau lands is essential to protect the multi-million dollar investment in construction and to afford low-cost transportation on smooth, well-drained roads. By 1965 the Bureau will be maintaining 4,600 miles of roads, not including those which are maintained under the terms of agreements with timber purchasers, right-of-way permittees, and other users.



OUTDOOR RECREATION. Bureau of Land Management lands include majestic mountains, with verdant timber-clad slopes cut by clear lakes and streams offering unparalleled beauty to those seeking recreational enjoyment of all kinds.

RECREATION

The Bureau of Land Management is aware of the growing public needs and demands for outdoor recreation. The rapid increase in population, a rising standard of living, shorter working hours, and expansion in every mode of transportation all point to an accelerated use of public lands for hunting, fishing, camping, picnicking, and other forms of outdoor living.

This demand for outdoor use of the land and its resources will require planning on the part of all Federal, State, local and private land holding agencies. The facilities of all will be taxed in the coming years, and it is important that intensive or extensive use for recreation be coordinated with other land uses.

No statistics or estimates exist of total past use of BLM lands for outdoor recreation purposes. Other public land agencies having specific recreation management roles report tremendous increases during recent years. The Forest Service, U.S. Department of Agriculture, experienced 68.5 million recreation visits to the national forests in 1958 and estimated use will reach 130 million visits by 1969, and 600 million visits by the year 2000. The National Park Service reported 59.3 million visits to national parks

in 1957 and estimates an increase to 81.8 million visits in 1966. Total visits to State parks numbered 216.8 million in 1957 and are expected to rise to 305.5 million in 1966. A parallel trend may be expected on lands under the jurisdiction of the Bureau of Land Management.

The need for recreational facilities may be divided into three types: (1) urban developments usually consisting of city and county parks with all the various playgrounds, pools, links, and courts; (2) great national, historical or scientific areas characterized by the lands included in the national park system and national forests; and (3) the intermediate public domain and other areas under the Bureau of Land Management jurisdiction which have many key tracts of scenic beauty and other natural advantages desirable for recreational development.

Public lands under the jurisdiction of the Bureau of Land Management are largely subject to transfer out of Federal ownership under the various public land laws. Furthermore, the Bureau is charged with the responsibility of conservation and wise use of the land and resources under the multiple-use concept.



FISHING is one of the important recreational uses of BLM land. Thousands of miles of clear mountain streams carrying many kinds of fish beckon and challenge the angler.

Recreation is one of several uses which must receive equitable and balanced consideration.

The Bureau of Land Management has planned a long range program to discharge proportionate responsibility along with other agencies in providing its fair share of the future outdoor recreation lands and facilities.

The basic premises upon which the Bureau of Land Management recreation program is developed are as follows:

1. Use of land for recreation will be of two major types—intensive and extensive. Intensive use includes campgrounds, picnic areas, and other areas where relatively large numbers of people congregate. Extensive use covers hunting, fishing, and hiking, where use is widely distributed over a large area. Where there are isolated blocks of public land suitable for recreational use of either type, every effort will be made to obtain access to these tracts through surrounding land by cooperative means.

The Bureau of Land Management will strive to obtain the cooperation of local sportsmen's groups, private landowners, permittees and licensees, State game and fish commissions and the general public in working out our policy that the public must have free access to public lands. In taking such action careful recognition will be made of the rights of private landowners; but where necessary BLM stands ready to use its full legal authority

to guarantee public access. The Bureau of Land Management will provide leadership in helping to identify an area's needs and then, where possible, bring together the parties concerned through cooperative efforts.

A second approach consists of reciprocal rights-of-way agreements between private landowners and the Bureau of Land Management. This method, however, is most applicable in cases where both the Federal Government and the private landowner have a resource which both desire to utilize and are willing to negotiate for rights and interests in rights-of-way. Many miles of access roads have been constructed by the Bureau of Land Management in the past, and these are now open to the public under conditions consistent with the purposes for which they were built.

A third approach toward obtaining access is through the execution of exchange-of-use agreements and the actual exchange of lands. Once an exchange has been negotiated resulting in free and open access to the public domain, the results are more permanent and satisfying to all concerned.

When the above approaches have failed to obtain the required public access, then rights-of-way may be obtained by the State, county, or Federal Government through formal condemnation proceedings in the courts. This method will be used only after all attempts to obtain access through cooperation and negotiation have failed.



BIG GAME hunters with gun, bow, and camera is offered the recreationist on BLM lands where continuity of wildlife is assured through balanced land management.

2. Under the leadership of the National Outdoor Recreation Resources Review Commission, the Bureau will help the National Park Service to make and maintain a current inventory of lands being used or having a potential for intensive recreational use.

3. Where in the public interest and intensive recreational use is deemed the dominant use, States or other appropriate groups will be encouraged to lease or purchase such lands for intensive recreational development.

4. Those public lands having several significant uses, including recreation, will be identified and managed by the Bureau of Land Management to assure equitable emphasis to all resource values.

5. Cooperate with States and other interested local agencies and groups in developing extensive recreational facilities on lands having significant multiple use values.

6. Since States, other local agencies and groups have a responsibility in sharing the cost burden of providing outdoor recreation, the extent of recreational development on Bureau of Land Management lands will be dependent upon cooperation in meeting over-all development and maintenance costs.

In line with the above basic premises, detailed considerations were given as to the outlook for outdoor recreational demand likely to develop in each State. Looking ahead to the year 2012,

each State made an estimated inventory of future recreational needs on Bureau of Land Management land based on individual State trends. The costs of development and maintenance of facilities to meet the estimated recreational needs were projected by years.

In arriving at the total cost of the development and maintenance of recreational facilities needed to meet the ever-increasing demand potential on Bureau of Land Management lands, the following specific criteria were observed:

1. Future recreational use will be principally governed by the desire for rustic camp sites of the family-unit type having a measure of privacy, yet affording a cleared area for tents or trailers with cooking facilities, sanitary facilities, and potable water.

2. Cost estimates were based on furnishing minimum satisfactory units of access roads, clearing, fire grates, garbage pits, sanitary privies, bulletin boards, and signs. In certain remote locations overnight shelters are planned. Only in areas of high intensive use will development exceed these requirements.

3. Inasmuch as the recreational use and the benefits of such use on planned sites are largely local, the primary initiative and responsibilities for such developments should rest with States, counties, municipalities, and appropriate local groups.



THOUSANDS of sites on public domain offer potentialities for recreational development.

EAGLE RIVER CAMPGROUND site before construction. Development of public recreation sites along Alaska's highway system was provided by special legislation. BLM constructed 48 such sites furnished with minimum facilities. The following three pictures show the Eagle River campground, north of Anchorage, before, during, and after construction. The BLM long range plan provides for extension of such recreational development in the other 11 Western States.





EAGLE RIVER CAMPGROUND during construction.

EAGLE RIVER CAMPGROUND after construction.



4. In certain cases it may be to the advantage of the Government to issue special use permits to groups or individuals at a nominal cost, plus a percentage of gross profits. The Government would obtain a guarantee of campground development and maintenance open to the public for the allowed concession of a store, lodge, boat ramps and rental, or similar income-producing facilities.

The total cost of all Bureau of Land Management activities relating to recreational land use is spread through several functional activities. The recreation function includes not only the construction and maintenance of recreational facilities, but also the cost of maintenance of operational buildings and facilities not directly related to recreation. Additional costs relating to fulfillment of the Bureau's recreational management responsibilities other than construction and maintenance of recreational sites are borne and allowed for within the total overall costs of activities enumerated below:

1. *Lands and Minerals*—Estimated proportionate share of:
 - a. Activity under the Small Tract Act and Recreation and Public Purposes Act.
 - b. Other case work activity since recreation is considered prior to taking other type of action.
 - c. Activity on intensive recreational areas involving protection of tenure, either by classification, withdrawal, lease, cooperative agreement, or a combination of these. This includes the intensive recreational inventory activity.

- d. Activity on land tenure adjustment work since one of the objectives of this activity is to identify and protect multiple use areas having, as one of their uses, values for extensive recreation.
- e. Informational activity.

2. *Forestry*—Estimated proportionate share of:

- a. Public informational activity.
- b. Consideration of recreational values in other resource planning.
- c. Administration of special land use permits.
- d. Supervision of small tract leases.
- e. Negotiations relating to Recreation and Public Purposes Act leases to States and counties.
- f. Recreational management planning relating to multiple resource use.

3. *Range*—Estimated proportionate share of:

- a. Technical cooperation with State and Federal agencies relating to wildlife management plans, season and number of harvest, game transplants, game range improvements, population census, and game checks.
- b. Determination of carrying capacity allowance for wild game.
- c. Range inspection with game management agencies to determine ratio of stocking and allowable kill.
- d. Recreation inventory on range lands and determination of use priority.

CADASTRAL ENGINEERING

Under basic law, it is the exclusive function of the Bureau of Land Management to execute the official survey and resurvey of the public domain regardless of administrative jurisdiction.

Cadastral surveys are defined by the Pan American Institute of Geography and History in a document published by the United Nations entitled "Modern Cartography, Base Maps for World Needs, 1949", as follows:

"Cadastral surveys in general create, re-establish, mark and define boundaries of tracts of land. Such surveys, unlike scientific surveys of an informative character which may be amended with changing conditions or because they are not executed according to the standards now required for accuracy, cannot be ignored, repudiated, altered, or corrected, and the boundaries created or re-established can not be changed so long as they control rights vested in the lands affected.

"The official record of a cadastral survey ordinarily consists of a drawing or map and a written description of the field work. The drawing represents the lines surveyed showing the direction and length of each of such lines; the boundaries, description and area of the parcel of land; and, as far as practicable, a delineation of the topography of the region, including a representation of the culture and improvements within the limits of the survey."

The rectangular system of public land surveys was established by the Continental Congress in the Land Ordinance of May 20, 1785; no counterpart or pattern for it existed. With modifications made from 1785 to about 1832, the system actually obtained perfection in principle. Numerous refinements of practice and improvements by the application of modern methods have been made, but it is the same in principle now and the same in purpose as it was then—a rectangular system of coordinates applied in a practical method.

At its maximum extent, the original public domain consisted of approximately 1.8 billion acres, or about 79 percent of the total land area of continental United States. It included the Territory of Alaska, the States of Florida, Alabama, and Mississippi, and all States, except Texas, lying north and west of the Ohio and Mississippi Rivers. The rectangular system of surveys has now been extended over 1.33 billion acres of this vast area. At present the unsurveyed area consists of about 475 million acres of which more than 76 percent is in the new State of Alaska. Less than one percent of the total area of Alaska has been surveyed.

Approximately 55 percent of the area of the 11 Western States (not counting Alaska and Hawaii) is owned by the Federal Government. Many of the original surveys of these Government lands were made from 75 to more than 100 years ago and the corners were marked with wooden stakes or other nonpermanent material. These corners were obliterated and there is now an urgent need for the resurvey of approximately 53 million acres of the public domain within these 11 Western States. Resurveys are

extremely urgent for the management of public timber lands in western Oregon and other public lands in forested areas; for the identification of oil and gas lands and other mineral areas for administration under the Mineral Leasing Act; for improvements in connection with management of grazing areas, including re-seeding, fencing, and soil conservation work; for administration of the Small Tract Act of 1938; for settlement of trespass cases; and for the survey of islands and other lands omitted from the original surveys and areas formed by accretion.

Basic survey records were essential to those who purchased lands in the early days of settlement and to those who sought agricultural lands under the Homestead Act of 1862. The rectangular system of public land surveys was extended before settlement, and the development of this country can be traced largely by the timing of the public land surveys. By the 1860's the surveys had been extended across the Mississippi, and large areas in California and Oregon had been surveyed to accommodate the settlement following the gold rush of 1849 and the migration to the Oregon Territory.

Prior to 1910, the public land surveys were executed by deputy surveyors who operated under negotiated contracts at a price from about \$2 to \$8 a mile. By act of Congress, the contract system of surveys was abolished in 1910 and since that time the work has been carried on by cadastral engineers employed by the Federal Government. By then much of the arable land area and the areas for which immediate needs could be foreseen had been surveyed, but large acreages in scattered and mountainous areas remained unsurveyed.

Under the contract system, the corner position monumentation was by the most durable native material available. Since 1910, the survey corners have been monumented with wrought iron galvanized posts having a brass cap on which the corner marks are stamped.

An important economic advantage of the rectangular scheme of surveys is that the lands are ordinarily conveyed in square units or legal subdivisions of 40 acres each. The land record in the counties of the public land States can thus be entered easily and maintained on printed and uniform size diagrams of township plats. Title records are much more complicated and involved in the older areas where the records must be compiled from innumerable irregular and uncoordinated survey records.

New Surveying Techniques

In recent years it has been necessary to execute original surveys in regions so fantastically rough and broken that, until the discovery there of uranium and petroleum, it was not believed that there would ever be a need for their survey. In some of these areas, it is necessary to transport engineers and survey equipment by helicopter in order to accomplish the required surveys. In order to expedite these surveys, modern electronic measuring devices and photogrammetric means are utilized.



MODERN TRANSPORTATION. Use of the helicopter to facilitate the running of the public lands surveys in the extreme northwest portion of Arizona. "Copter" has landed on top of a relatively inaccessible rocky high point of the Virgin Mountains. The occupation of this position is required in the execution of the survey, and without the use of the helicopter, would necessitate a dangerous and time-consuming climb up an escarpment of over 2,500 feet.

The traditional cadastral survey methods, which have worked so well in other public land States, cannot be applied in their entirety to Alaska. Congress has already recognized this situation by authorizing special surveys under special conditions. The intent of the regulations is clear, however, that the system of rectangular surveys is to be followed if possible. It is evident, though, that the customary methods of extending rectangular surveys out from an initial point would not be satisfactory in Alaska.

Many considerations necessitated a different approach to existing methods of public land surveys. The size of Alaska, the land use pattern which differed radically from those in other States, and the physical difficulties and expense of extending an extensive land survey net over an area for which there was no immediate demand or foreseeable advantage to be gained, were some of these considerations. Another was found in the terms of Statehood which permit the State to select lands of its choice on a quantity basis. This will make it possible to provide a firm basis upon which management and administration of the unsurveyed lands could be carried out prior to actual survey.

Protraction Diagrams

In order to provide a basis for immediate land management, the preparation of protraction diagrams was begun and will cover all unsurveyed lands in Alaska. This will be completed in the near future, probably in 1961.

This extension of the rectangular survey system by protraction has been completed in Arizona and will be extended over the remaining unsurveyed lands.

Alaska protractions will represent a theoretically perfect survey of townships and their sections tied to the earth's surface by latitudes and longitudes. This geographic location of corners advances a new principle in land surveys and makes the protraction scheme practical. Important topographic detail will be taken from the best available source and shown on the diagrams. Land and water areas will be given for each section.

These diagrams introduce the concept that for all purposes short of actual conveyance, the locus of technically unsurveyed lands can be defined by the representation of the protraction plats and described in terms of the rectangular system. The theory behind the plan is that corners of the public land surveys can be designated

first by latitudes and longitudes. All existing horizontal control will be shown which will permit any interested person to identify and describe his location. As an additional aid, he can also determine his location roughly from the topographic detail. When a monumented survey on the ground is required later as for patent purposes, it can be initiated by first establishing a public land corner from horizontal geodetic control monuments.

The physically identified and monumented corner positions will have all the force of corners located using regular rectangular ground survey methods. This plan will permit the ground survey of areas remote from existing public land surveys without first extending the survey grid. When ground surveys are made, they will supersede the protraction plats for the area they represent.

Outer Continental Shelf Surveys

To carry out the provisions of the Outer Continental Shelf Lands Act for leasing and development of the resources of the sea bed, a project for establishment of suitable leasing blocks has

been undertaken. The leasing blocks have been delineated in the entire area of the Outer Continental Shelf offshore from Louisiana, as well as a substantial area offshore from Texas and a small area offshore from Florida. Studies are under way in areas offshore from California and Alaska. The project encompasses the entire area of the Outer Continental Shelf along the Atlantic and Pacific coasts and the Gulf of Mexico as necessary for leasing.

The lease blocks are, in general, approximately 5,000 acres. The boundaries are defined by their position under the appropriate State plane coordinate system. Control stations whose positions are fixed and monumented on shore, afford a means for precise determination of points offshore by modern electronic measuring devices.

Program Requirements

The need for resurveys is estimated to be 85 percent greater than the need for remaining original surveys. Relatively little

MODERN EQUIPMENT. On line with a cadastral survey party running electronic traverse to locate isolated small tracts and determine the ground position of the protraction surveys at Tangle Lakes east of McKinley National Park. Instrument on the right is an electronic distance measuring device; on the left is a precision theodolite.



unsurveyed land remains in the United States, probably not more than 475 million acres. The main survey activities of the Bureau of Land Management are now directed toward the resurvey of the public lands where, for one reason or another, the evidence of the original survey has become lost or obliterated. Also, there is the need for resurvey and remonumentation of the boundaries of areas subject to intensive development, such as reclamation projects.

There are large areas of unsurveyed public land included in permanent reservations, such as National Forests and National Parks, in which the extension of the public land surveys probably never will be undertaken. It will be necessary to survey only the outer perimeter of such areas for administrative uses. Of the 178 million acres of public lands in eleven Western States now under the exclusive jurisdiction of the Bureau of Land Management, it is estimated that over 65 percent will require resurvey between 1961 and 2012 to permit management of the land and resources, including trespass control.

The State's selection in Alaska may or may not conform to the rectangular system of surveys. Consequently, the surveys fall into the category of special surveys. Special surveys also include those where little or no reportable acreage is involved in comparison with the miles of survey and time required. In order to place such surveys on a common basis with original surveys and resurveys, they are shown as equivalent acreage using a ratio of 318 acres per mile of line. This type of work includes small tracts, townsites, some park and recreational areas, and the resurvey or remonumentation of National Forest boundaries.

The total acreage surveyed annually will increase from 2.5 million acres in 1961 to 9.7 million acres per year by 1980. It is expected that the survey and resurvey by township units will decrease considerably toward the close of the 1980 to 2012 period. By this time, the Bureau would have reduced its annual rate of surveys to 1.8 million acres per year because the only survey needs would be those confined to surveys of greater accuracy made for specific purposes. At the year 2012 it is expected that the total amount of cadastral surveys made by this Bureau would be an equivalent of 268,678,000 acres.

The cadastral survey program will be accelerated to near maximum capacity by 1965. The recruitment and training of qualified personnel will be a major item. During this period the most urgent current survey needs will be met and the accumulated backlog will be reduced. There is a pressing need to move with considerable strength to survey or remonument the boundaries of the National Forests as well as those of BLM lands. New methods, equipment, and techniques will be developed during the coming years which will increase the rate of progress and at the same time reduce the manpower per unit output.

Special projects to prepare protraction diagrams of unsurveyed areas are expected to be completed by 1965. It is anticipated that practically all land now classed as unsurveyed, including that which must be resurveyed because original contract surveys were inaccurate, will have been resurveyed by the end of 1980.

It is anticipated that many resurveys of townships, for the sole purpose of restoring corners that have become obliterated by age, will be necessary, particularly in timbered areas and semi-arid lands where increasing values will require accurate locations.



CADASTRAL SURVEY PARTY blazing and scribing bearing tree which will serve to perpetuate the public land marker, a galvanized iron post capped by a brass top on which the location is stamped. The solar transit has been set up over the monument to obtain a bearing to the scribed tree and the distance is being measured.

GENERAL DIRECTION

Adequate administrative staffs must be maintained to support the various technical programs. Costs and manpower requirements for the technical activities include all general administrative or "housekeeping" changes.

The years ahead will be years of change. Changes in communications, in office procedures and field techniques, and in the nature and emphasis of various Bureau programs themselves will require constant adaptation of new and varied administrative procedures within the Bureau to maintain maximum efficiency.

A dynamic growth in the volume and intensity of the Bureau's resource management will be reflected in an increasing volume of data, records, procedural guidelines, and similar elements. The constant streamlining of procedures and techniques to meet the challenge of this material will be essential.

A vital element of this program will be the automation of many procedures now manually performed. It will be the responsibility of BLM to study such techniques and equipment, to develop feasible applications for it, and to install such systems and equipment as appear practical and economical. At the same time, it will be necessary to plan and implement those changes in Bureau organization and structure as are necessary to maximize the productive results of such a program.

Positive personnel recruitment and personnel management programs must continue on an expanding basis to assure the Bureau an adequate reservoir of trained, professional, and sub-professional talent. In addition, continued emphasis will be given to management improvement and incentive awards programs.

Budget and accounting systems will be maintained to assure adequate fiscal controls and to provide information which is required by BLM supervisors and employees.

Planned procurement programs to make best use of market conditions will assure supplies and equipment are available at the point of need at the least possible expense to the Government.

Through its training programs, the Bureau aims to orient quickly new recruits, to provide on-the-job training, special skills training and outside training for development.

The information program will be geared to inform the public of its rights and privileges under the public land and mineral laws.

The Bureau of Land Management has several unique programs including a project for revision of the land records which are basic to the whole real property structure of the public land States.

These original land records, some of which originated as far back as 1800, are in a serious state of deterioration and disrepair, and contain many documentary inaccuracies which are detrimental to the effective and efficient determination of land and resource status. The Bureau has undertaken the complex task of completely revising its status records. This program will result in improved and modernized records and will permit the Bureau to proceed more effectively and more realistically with its programs of land and resource management and development. The new system is providing records which will fulfill all present and conceivable future requirements for status recordation and determination.

New records have now been prepared for the States of Oklahoma, New Mexico, and Utah; are currently being prepared for Arizona by contract and for Alaska by force account; and will be prepared for the remaining public land States, which are situated wholly or partially west of the 99th Meridian, within the next 7 to 10 years.

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

R'S CARD

765 1961 v.1
of Land

y-Twelve

OFFICE	DATE RETURNED

(Continued on reverse)

QH 76.5 .U5 P765 1961 v.1
U. S. Bureau of Land
Management.
Project Twenty-Twelve

BLM LIBRARY
RS 150A BLDG. 50
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, CO 80225

