THE NATIONAL POLICY TOWARD RECLAMATION AND CONSERVATION
OF NATURAL RESOURCES SINCE 1900

APPROVED:

Lewis W. Newton
Major Professor

Marie E. Smith
Minor Professor

Lewis W. Newton
Director of the Department of History

L. A. Sharp
Chairman of the Graduate Council
THE NATIONAL POLICY TOWARD RECLAMATION AND CONSERVATION
OF NATURAL RESOURCES SINCE 1900

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Jo Clark Rutledge, B. S.

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CHAPTER I

INTRODUCTION

We, the people of the United States, are indeed fortunate. Today we are endowed with a rich heritage of human resources, stimulated by the revitalizing powers of a vast reservoir of natural resources. In this tragic hour when the people are on the march as a part of a great military parade, we have come to realize that the endurance of the United States depends not alone upon these men, but also upon the resources that are at their service. We should be as deeply concerned about the losses from exploitation as we are about any similar damage that could be done by an enemy.

The conservation of our resources involves the welfare of the citizens, the family, the community, the state, and the nation.\(^1\)

The United States contains within its borders the greatest supply of natural resources of any nation on earth. We have a wealth of diversified raw materials and a richness and variety of climate unequalled in any other country. The

\(^1\)Karl E. Ashburn, *Conservation as a National Policy*, p. 2.
tremendous wealth of these natural resources has been the basis of our national prosperity. These natural resources include the land on which we live and which yields our food; the living waters which fertilize the soil, supply power, and form great avenues of commerce; the forests which yield the materials for our homes, prevent erosion of the soil, and conserve the navigation of our streams; and the minerals which yield the basis of our industrial life, and supply us with heat, light, and power.  

When this country was first invaded by white men, vast numbers of American buffalo roamed the plains at will; the elk in great herds inhabited the forests from coast to coast; the antelope ranged the plains, its numbers rivaling those of the bear, bison, moose, and deer. Wild swans, geese, and brant were to be found in every area of marsh lands in proper seasons; wild ducks, shore birds, rails, cranes -- all were to be found in great numbers.  

The United States leads the world in the variety and abundance of mineral products. As early as 1897 the United States was the greatest petroleum producer of the world. The United States produced 58.1 per cent of the world's petroleum in 1901 as compared to 61.3 per cent in 1940.  

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Today the known fields of petroleum are located in six regions -- Illinois, Appalachian, California, Lima-Indiana, Texas-Louisiana, and Kansas-Oklahoma. The estimated quantity of known petroleum reserves available is between 10,000,000,000 and 25,000,000,000 barrels. In 1901 the copper production of the United States was fifty-three per cent of the world production, and even in recent years it has been thirty per cent of that produced by the world. The chief copper-producing states are Michigan, Montana, and Arizona. Other states producing copper to any extent are Utah and California. Gold mining began on a large scale in the United States in 1846 when placer gold was discovered in California. Gold mines exist in nearly all of the Rocky Mountain states. The discovery in 1859 and the development of the rich Comstock Lode in the western part of Nevada called attention to the vast silver deposits in the Rocky Mountains. Montana, Colorado, and Utah have extensive silver mines. The bituminous coal fields comprise 250,000 square miles mainly located in two areas. The Appalachian area is the most important, extending from Alabama to Pennsylvania. The second is the interior region comprising Michigan, Illinois, Indiana, Kentucky, Iowa, Kansas, Oklahoma, Arizona, and Texas. 4

Of the approximate 630,000,000 acres of forest land

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in the United States today, only about 462,000,000 acres are capable of producing valuable timber and other forest products. About three fourths of this commercial forest land is under private ownership. Industrial ownership is the most important type of private ownership, the best forest land being owned by lumber, paper, and mining companies, and by naval store operators and railroads; next in importance to industrial ownership is farmer ownership of forest land, under which there are 185,000,000 acres, of which ninety-five per cent of the forest tract is east of the Mississippi River and largely in the South. The developed and potential forest areas are confined to regions of relatively high relief and high rainfall. The annual growth of timber is estimated at 9,000,000,000 cubic feet of live timber. Estimates show that the annual consumption of timber is four times as great as the annual increase in supply.  

For two generations, during the growth of our population, each citizen considered the abundance of wildlife as his natural inherent right with no thought of others than himself, either in this generation or in future generations. Wildlife was wantonly slaughtered or otherwise destroyed, and the remnants crowded to remote spots of the wilderness.

5United States Department of Agriculture, Living in Forest Lands, p. 22.
Our streams were depleted of fish and in many cases polluted. The pioneers looked upon wildlife as an inexhaustible source of supply for food and clothing. They depended upon it for the essentials of life. A few of them made fabulous sums in trapping for meat or in killing for furs. Soon, many species declined alarmingly and others faced extinction. The grizzly bears are on their last stand. Approximately 60,000,000 of these rugged animals roamed the great plains, but they gave way to the ruthless slaughtering practiced by the advancing civilization.\(^6\) However, through careful management and protection by conservation agencies in recent years, existing herds have been brought up from almost nothing to over four thousand head. Of the birds, the passenger pigeon, heath hen, and Labrador duck are gone.\(^7\)

A similar devastation of our forests occurred. The pioneers needed land for a growing population. In clearing away our forests they obtained plow land for crops, fuel, timber for buildings, and a cash income. The reports of the explorers to the West that the forests were without end led to the belief that this resource was inexhaustible. Destruction of the forests was to the pioneer an exchange of an excess of timber for other things that he needed. So

\(^6\)C. N. Elliot, *Conservation of American Resources*, p. 112.

\(^7\)A. E. Perkins and J. R. Whitaker, *Our Natural Resources and Their Conservation*, p. 9.
rapid was the rate of exhaustion that it was feared that the United States would face a timber famine. Since 1870, forest fires have annually destroyed an average of $50,000,000 worth of timber. In addition to the effect upon the lumber supply, the forest problem has a far-reaching influence upon the improvement of internal waterways, water-power development, reclamation of arid and swamp lands, and the prevention of floods, and the preservation of the soil.

Within the past seventy-five years, 35,000,000 acres of good farm land, which is the equivalent of 219,000 farms of 160 acres each, have been ruined.¹ No exact monetary values can be placed on the loss of soil, but one can easily see the human misery inflicted by poor crop yields.

Mineral resources are not self-replacing. In the mining of coal, it is estimated that the average loss amounts to thirty-five per cent. The mining loss is largely due to leaving pure coal in the mines in the shape of pillars, partitions, etc., most of which becomes covered with stone and earth and rendered unfit for further extraction. It is estimated that the yearly waste in production of coal amounts to $300,000,000.

To arouse the sentiment of the people on the question of conservation and reclamation was very difficult, because it meant the reversal of the attitude of most of the Americans.

¹Owen P. White, All Washed Up, p. 1.
toward the natural resources of the country. The established theory with regard to most of the resources was that the general prosperity of the country could best be developed by the use of private capital, and upon this theory land was given away or sold for a trifle. Prior to 1900, even the use of such obvious resources as water sites had been neglected except by a few large corporations.

The conservation movement began in the first half of the nineteenth century with the realization that the resources of the continent were not unlimited. In 1828 John Quincy Adams, recognizing the importance of timber in the construction of battleships for the Navy, established a naval station at Pensacola, Florida. He had a survey made of the liveoak supply on the coasts of Florida, North Carolina, and Georgia. He withdrew 30,000 acres of land where the liveoaks flourished on the island of Santa Rosa and there provided for the cultivation of liveoak timber. Thus, in the early part of the nineteenth century, a president of the United States, recognizing to some degree the importance of conservation, established the first national reservation and inaugurated a carefully planned forestry program. In 1871 the Bureau of Fisheries was organized as an agency to conserve the supply of food fishes. In 1872 Congress


10Farkins and Whitaker, op. cit., p. 3.
created the Yellowstone National Park, comprising 3,500 square miles in Wyoming. In 1873 a memorial was prepared and presented to Congress by the American Association for the Advancement of Science, to be reinforced in 1890 by another statement, urging upon Congress the importance of passing laws which should lead to the conservation of natural resources. In 1875 a group of citizens came together in Chicago and organized the American Forestry Association for the purpose of promoting publicity and appreciation of scientific forestry and the culture of timber.11 This was the first well-organized movement to foster public sentiment in America. In 1879 the Geological Survey was established by Congress to classify the public lands, mineral resources, and products of the public domain. In 1885 the Biological Survey was created to preserve, restore, and develop the wildlife of the fields and forests of the nation. Through the efforts of Franklin B. Hough, who had been a member of the American Association for the Advancement of Science, Congress in 1881 established the Division of Forestry in the Department of Agriculture, and Hough headed the work. In 1890 Benjamin Harrison created the Yellowstone National Park Timberland Reserve in northwestern Wyoming. Before the expiration of his term, he set aside 13,417,710 acres of forest reservation in the

11Van Hise and Havemeyer, op. cit., p. 5.
states of Colorado, Oregon, California, and Wyoming. Cleveland, who followed Harrison's administration, enlarged the national forests to 39,103,030 acres. In 1891 Congress authorized the President to set aside forest lands from the public domain as reserves.\textsuperscript{12} This act led to the creation of the National Forest Reserve System. In 1894 Congress recognized the need of assisting irrigation development and the Carey Law was enacted, under which areas of public lands were ceded to the states for development by private capital. No funds were furnished by the Federal government and the results of the Carey Law were unsatisfactory. In 1898 the cause of conservation was further expedited by the appointment of Gifford Pinchot as Chief of the Division of Forestry.

The people of the United States became fully aware that our resources were not inexhaustible when Theodore Roosevelt became President in 1901. To understand his deep interest in conservation it is necessary to know something of his early life and experience. As a youth he was a sickly, delicate boy who suffered from asthma. Because of this handicap and his nearsightedness, he spent much of his time alone. This time he spent in keeping a notebook in which he recorded his observations of plant life -- the observations which were to become the germinating interest in

\textsuperscript{12}Department of Agriculture, Forest Conservation, p. 46.
his later so-called conservation program. "With his great enthusiasm he used his voice, his pen, and his official influence to arouse an appreciation of the waste of the resources." 13

Roosevelt's deep interest in the forest and water problems caused him to add two new words to our national language -- "reclamation" and "conservation." These words eventually led to two great conservation movements for the preservation, increase, and utilization of natural resources and the establishment of a new relationship between the Federal government and the nation's wealth.

The germ of the national conservation movement took form in an address delivered by Theodore Roosevelt before the Society of American Foresters, March 26, 1903. He said the following to the forestry students:

Your attention must be directed to the preservation of forests, not as an end in itself, but as a means of preserving the prosperity of the Nation. In the arid region of the West agriculture depends first of all upon the available water supply. In such a region forest protection alone can maintain the stream flow necessary for irrigation and can prevent great and destructive floods so dangerous to communities further downstream. . . . The relation of all the industries to forestry is of the most intimate and dependent kind. 14

Conservation as a single problem and as a basis for a national policy was clearly outlined in the President's

13 Parkins and Whitaker, op. cit., p. 6.

address before the National Editorial Association in Jamestown, Virginia, June 10, 1907, the tenor of which appears in this passage:

In utilizing and conserving the natural resources of the nation the one characteristic more essential than any other is foresight. . . . The conservation of our natural resources and their proper use constitute the fundamental problem which underlies every problem of our national life. Unless we maintain an adequate material basis for our civilization, we cannot maintain the institutions in which we take so great a pride; and to waste and destroy our natural resources means to undermine their bases.

So much for what we are trying to do in utilizing our public lands for the public; in securing the use of water, the forage, the coal, and the timber for the public. In all four movements my chief adviser, and the first man to suggest to me the course which was to prove so beneficial, was Mr. Gifford Pinchot, Chief of the National Forest Service. Mr. Pinchot has suggested to me a movement supplementary to all these movements, one which will itself lead the way to the general movement which he represents and with which he is actively identified, for the conservation of all our natural resources. This was the appointment of the Inland Waterways Commission.15

The White House Conference grew out of the Inland Waterways Commission. On a trip of that commission on May 19, 1907, it was suggested that there be a conference at Washington the ensuing year to consider the conservation of natural resources. Chairman Theodore E. Burton and Commissioner Gifford Pinchot were authorized to convey to the President the idea of the commission. It was suggested that since

15Ibid., p. 23.
conservation concerned not only the nation, but every state, such a conference should include the governors of the states.

The President approved the plan in November and issued letters to the governors which carried this message:

My Dear Governors: The natural resources of the United States were, at the time of the settlement, richer, more varied, and more available than those of any other equal area on earth. The development of these resources has given us for more than a century a rate of increase of population and wealth without parallel in history. It is obvious that the prosperity we now enjoy rests upon these resources. It is equally obvious that the vigor and success which we desire and foresee for the nation in the future must have this as an ultimate material basis.

In view of these facts it seems to me it is time for the country to take account of its natural resources and to inquire how long they are likely to last. We are prosperous now; we shall not forget that it will be just as important to our descendants to be prosperous in their times...

It is evident that the abundant resources on which the welfare of the nation rests are becoming depleted, and, in a few cases, are already exhausted. . . . The gravity of the situation must, I believe, appeal to the Governors of the States, because of their close relation with the people. . . .

It gives me great pleasure to invite you to take part in the conference. . . . I earnestly hope, my dear Governor, that you will find time to attend.16

The audience that assembled on May 13, 1908, in the East Room of the White House was indeed an impressive one: upon the right of the President sat the Vice-President and seven members of his Cabinet; upon his left sat the justices of the Supreme Court; before him were assembled the governors of all the territories, including Alaska, Hawaii,

16 Ibid.
and Puerto Rico, the governors of thirty-four states, representatives of sixty-eight national societies, four special guests, forty-eight general guests, and the members of the Inland Waterways Commission.17

The conference was opened by a notable address by Theodore Roosevelt, followed by addresses delivered by scientific men, governors, and eminent citizens. While assembled in its three-day session, the Conference of Governors declared the following principles:

We recognize the mutual interests of the Nations which occupy the Continent of North America, and the dependence of the welfare of each upon its natural resources is indispensable for the continued prosperity of the country.

We consider that the protection of the mutual interest related to natural resources by concerted action, without in any way interfering with the authority of each Nation within its own sphere, will result in good-will, confidence, and respect. Natural resources are not confined by the boundary lines that separate Nations. We agree that no Nation acting alone can adequately conserve them, and we recommend the concurrent action for conserving the material foundations of the welfare of all Nations concerned, and for ascertaining the location and extent.

We recognize as natural resources all materials available for the use of man as a means of life and welfare, including those on the surface of the earth, like the soil and waters; those below the surface of the earth, like the minerals; and those above the surface, like the forest. We agree that these resources should be developed, used, and conserved for the future, and in the interest of mankind, whose rights and duties to guard and control the natural resources of life and welfare are inherent, perpetual, and indefeasible. We agree that the resources which are necessities of life should be regarded as public

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17 Van Hise and Havemeyer, op. cit., p. 7.
utilities, that the ownership entails specific duties to the public, and so far as possible effective measures should be adopted to guard against monopoly.18

Just as conservation made very rapid progress during Theodore Roosevelt's administration, reclamation likewise received his attention in his first message to Congress when he said:

It is as right for the National Government to make the streams and rivers of the arid region useful by engineering works for the storage of waters as to make useful the rivers and harbors of the humid region by engineering works of another character.19

From the first, reclamation was more popular than conservation. Both had this in common: the intelligent and efficient utilization of the natural resources of the country for the entire people. They differed in this respect: conservation began by withholding natural resources from exploitation; reclamation meant the spending of public money to render fertile certain lands that had hitherto been considered worthless. "It took from no one anything that he had; it interfered with no one's enjoyment of benefits."20 Only six months elapsed between the first statement in Theodore Roosevelt's administration and its enactment into the Reclamation Law of June 2, 1902.

18 Ibid., p. 535.
19 Carl Hayden, National Irrigation Department, Its Development and Significance, p. 11.
20 H. Howland, Theodore Roosevelt and His Times, p. 131.
This act received a vote of 146 to sixty-five in the House of Representatives, and there was little serious opposition in the Senate. It set aside the proceeds from the sale of public lands for the purpose of reclaiming the arid lands of the West. Money expended on the projects was to be repaid without interest in due course of time, a concession reflecting a national interest in the program. Each project was to be self-liquidating through charges assessed against settlers.\textsuperscript{21} The Secretary of the Interior had charge of reclamation and was authorized to investigate and construct feasible irrigation projects. Within four years the Secretary of the Interior had approved twenty-six projects located in fourteen western states. These marked the beginning of the construction projects.

Originally the Department of the Interior was a department of exploitation; that is, it was chiefly concerned with the taking of natural resources. But in recent years, by executive action, legislation, and administration, the resources have been so grouped in the department that it is in truth a department of conservation. An observation of the work of the department determines this conclusion.

Its jurisdiction reaches from the Arctic Circle to Puerto Rico; its responsibilities range from the welfare of the native of the Aleutian Islands to the helium plant in Texas; from the improvements of the Middle Atlantic States fisheries to the administration

\textsuperscript{21}Ashburn, \textit{op. cit.}, p. 2.
of the national areas in Hawaii. In all the far-flung area it is an official guardian of our natural resources.\textsuperscript{22}

Though legislation has been efficiently handled by all of the Presidents since 1900, the two greatest conservationists in the first four decades of the twentieth century have been Theodore Roosevelt and Franklin D. Roosevelt.

CHAPTER II

SOIL CONSERVATION

The responsibility of a national program of soil conservation falls upon the nation -- a nation of individuals. National responsibility involves the protection of this resource of soil, which is greatly vital to the people. Consequently, this national responsibility necessitates the education of the individual in the proper use of the land. Within three centuries we have fully occupied our lands. President Franklin Roosevelt's Executive Order of 1936, withdrawing public domains from homestead entry, closed the frontier of public lands forever. Upon the conservation of what lands we have today our civilization depends.

The underlying purpose guiding the use of soil resources is to maintain the highest standard of living for the people of the United States. This includes secure farm homes, adequate and stable incomes for farm people of the United States, and a continuous and abundant supply of farm products for all people.¹

If future generations are to live, we must assure their

¹Cove Hambridge, Soils and Men, p. 3.
welfare. One of the greatest national objectives is to pass the soil to our descendants as unimpaired as possible.

Attention was called to the farm problem in 1914 when the European war's waste of human life and the cessation of trade and intercourse affected all mankind. Agriculture's balance was greatly upset by the first World War. When the agricultural production of the nations of Europe declined, America called out the reserves of its land power.

When the United States entered the war, an appeal was made to the farmers to grow more food. Patriotic posters shouted: "If You Can't Fight, Farm," "Food Will Win the War," "Plow to the Fence for National Defense." 2 Immediately, the United States became the bread-basket or the granary for Europe. Patriotism made the Americans plant and profit made them continue to plant. In a short time forty million acres had been uprooted by the plow. 3

This war-time plow-up was costly to the American people. In years to follow it contributed to over-production, low prices, and serious damages to a tremendous acreage of land. Much of the land which had been unsuited to cultivation later became the scene of dust storms.

The nation is still paying for this war-time plow-up campaign in ruined soil and land values, in lower prices, and in money toward the relief of people and the restoration of the soil. 4

2Department of the Interior, Achieving a Balanced Agriculture, p. 2.

3Katherine Glover, America Begins Anew, p. 32.

4Paul B. Sears, Deserts on the March, p. 7.
Erosion, an outgrowth of this plow-up, is a national menace because it is stealing the resources upon which we are dependent for life and comfort. Of it Paul B. Sears says in his impressive work, Deserts on the March:

Erosion like many other courses of humanity grows upon what it feeds upon. It behaves like compound interest. As a gully cuts back, others are formed and the damage spreads like a ringworm, in a circle. The more it eats the more it wants. The injury grows not by addition, but by multiplication -- a truly frightful thing to contemplate.\(^5\)

Unrestrained soil erosion is sapping the vitality of our nation and leaving an empire of worn-out land. Three billion tons of soil are washed out of American fields and pastures annually. To haul away such a bulk of soil would require a train of freight cars long enough to encircle the globe twenty-seven times at the equator. Approximately 400,000,000 tons of the matter are washed into the Gulf of Mexico annually.\(^6\) It is an indisputable fact that human life cannot exist without productive soil, and it would be futile to try to place any monetary value on this resource; yet it would be worthwhile approximately to value the vast quantity of plant material that is destroyed by erosion. If we estimate the value of the available nutrients -- considering them as raw materials for bread, milk, beef, and garments -- the amount is staggering.\(^7\) The loss of these

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\(^5\)Ibid. \(^6\)Elliott, op. cit., p. 379. 
\(^7\)R. H. Bennett, Soils and Security, p. 10.
nutrients, together with lowered crop yields, probably amounts to a total of more than a billion dollars a year.

President William Howard Taft in his address before the National Conservation Commission, Kansas City, Missouri, on September 25, 1911, stressed the necessity of introducing a better system of farming which would reduce soil erosion by emphasizing the importance of contour farming, forest protection, and the rotation of crops in order to insure the continued production of food in this country in sufficient quantities to feed the growing population.\(^8\)

Looking across the background of events which led to the present national program of soil conservation, one sees the following points. The findings of the soil survey of Fairfield County, South Carolina, in 1911, disclosed that 90,000,000 acres of the formerly cultivated land had been cut by gullies. This was the first survey of a large land area of America, which pointed specifically and quantitatively to the wholesale ravages of unrestrained soil erosion.

In the late 1920's another step toward recognition of the seriousness of erosion was the educational campaign carried on by the United States Department of Agriculture. In this effort, Soil Erosion, a National Menace, published in 1928, played a large part. This program of education

\(^8\) Address before the National Conservation Conference, National Conservation Addresses and Proceedings, III (1912), 55.
aroused nation-wide interest, and on December 18, 1928, the House of Representatives adopted, without a dissenting vote, the amendment of Honorable James P. Buchanan appropriating $160,000 for the Bureau of Soil and Chemistry and the Bureau of Public Roads, in cooperation with the agricultural colleges of the states and other agencies, for the purpose of establishing demonstration stations to test different soil types in various states of the Union, to the end that the soil problem might be carefully studied and solved. As a result of this endeavor, ten Soil Erosion Experiment Stations in ten agricultural regions of the country were established.\(^9\)

Arthur M. Hyde, Secretary of Agriculture, in collaboration with the Association of Land Grant Colleges, called the National Conference on Land Utilization in Chicago, November 19-21, 1931. Representatives from the Federal Land Board and the Secretaries of Agriculture were present. The conference recommended an inventory of land resources and an economic land use classification as a basis of land policy; licensing and regulation of land-settlement enterprises; steps for the prevention or reduction of soil erosion and other forms of soil depletion. This conference devoted special attention to submarginal lands. It recommended the coordination of state and Federal policies to

withdraw submarginal crop lands from cultivation and uti-

lize them as forests, game refuges, and bird sanctuaries.10

The first Agricultural Adjustment Act, passed by Congress
on May 12, 1933, marked the beginning of an economic democ-

racy of agriculture. The principal features of the Agri-
cultural Adjustment Act were:

1. Establishment of a yardstick of economic equality
   for agriculture.
2. Provisions for the adjustment of production of
cotton, corn, hogs, rice, wheat, tobacco, and
milk and its products.
3. Provisions for benefit payments to farmers who
   signed contracts agreeing to cooperate in the ad-
   justment program.
4. Provisions for the levying of taxes on the first
   processing of the domestically consumed portion
   of the seven basic commodities that are below the
   fair exchange value.
5. Provisions for marketing agreements between the
   Secretary of Agriculture and the processors and
   handlers of farm commodities as a means of regu-
   lating the marketing of these commodities and in-
   creasing producer's incomes.
6. Provisions for organizing associations of pro-
   ducers to carry out the program authorized under
   the act.11

The primary two-fold purpose of this act was to lift
prices by cutting down the production of crops of which
there was a price-depressing surplus; and to put money in
the hands of farmers by making direct payments to them as
compensation for taking land. This crop adjustment program

10Department of Agriculture, Achieving a Balanced
Agriculture, p. 13.

11L. C. Gray, National Conference Recommends Program
of Action, p. 460.
neglected to provide for the solution of a physical problem: that of protecting the land taken out of cultivation from erosion and loss of fertility.

In 1934, when the first great offensive was made under this triple Agricultural Adjustment program, about one out of every ten acres of cultivated land shifted from crops that deplete the soil to crops that feed the soil.

A definite need for soil conservation arose on the plains area when on May 11, 1934, a single dust storm swept 33,000,000 tons of top soil off the fertile wheat plains of the West. These black blizzards did serious damage to livestock and machinery, and seriously impaired the health of many people. At Amarillo, Texas, during March and April, 1935, there were seventeen days in which visibility was limited to six miles or less because of dust storms. On several occasions, because of the darkness in the middle of the day, artificial lights were needed.

As a consequence of these storms, the adaptability of the Agricultural Adjustment Act program received its first test. Heavy losses of livestock were prevented through livestock purchase operations, and the program was modified to encourage drought resistant emergency forage crops.

The Soil Erosion Service, established first in the Department of Interior and subsequently transferred to the Department of Agriculture, inaugurated a program of soil-
conservation demonstrations in cooperation with private
land-owners. With the creation of this program the Federal
government started lending direct assistance to the farmer
in soil and water conservation work. In 1934 when this
Service made a nation-wide survey to determine the extent
of erosion by wind and water, it found that in the grass
areas approximately twelve per cent of the land had been
ruined for immediate cultivation. We have lost the use of
fourteen per cent of our other farm land and made marginal
land out of thirty-five per cent of the rest, not by any
natural catastrophe, but simply by carelessness and out-
right abuse.\textsuperscript{12}

In 1935 conservation became a more definite policy when
the Soil Conservation Service was set up by act of Congress
as a permanent agency of the Department of Agriculture. This
was directly an outgrowth of the Soil Erosion Service.
On March 25, 1935, by an order of the Federal Administration
of Public Works, the Soil Erosion Service was transferred
from the Department of the Interior to the Department of
Agriculture. The activities of this service include: the
conduct of soil conservation demonstrations; improvement of
control measures through research; and continuance of edu-
cational activities on the evils of erosion. The problems
of water erosion on important watersheds of the United

\textsuperscript{12}Bennett, \textit{op. cit.}, p. 7.
States and the equally important serious effects of wind erosion on drier areas receive attention. In various parts of the country where the erosion problem was acute, the Soil Conservation Service selected watersheds ranging from 20,000 acres to 100,000 acres and established a series of model projects to demonstrate soil conservation. Specialists experienced in land use, farm management, and forestry conduct the demonstrations. The government has five-year agreements with the farmers, in which it agrees to provide technical advice and such labor and materials as the farmer cannot supply, provided the farmer in turn follows the plans laid down by the government. By July, 1937, one hundred seventy-four soil savings projects located in forty-five different states and Puerto Rico, involving 50,000 to 75,000 farmers, had been started. In Federal lands the project represented 39,244,944 acres, but within the zone of influence other millions of acres were involved.13

The adjustment program as provided by the Agricultural Adjustment Act of 1933 was suddenly brought to a halt by the Supreme Court decision in the Noosac Mills Case in January, 1936. This verdict of the Supreme Court held that the Agricultural Adjustment Act was unconstitutional in that it was a scheme for regulating and controlling

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agriculture, whereas this power resided in the states and not in Congress. In its place, Congress enacted the Soil Conservation and Domestic Allotment Act, which continued provisions of the Soil Erosion Act of 1935. The act authorized annual appropriations of $500,000,000 for payments for carrying out the purposes of that act.\textsuperscript{14} The carrying out of the specific soil-building practices requires some cash outlays on the part of the farmer, and the conservation payments are compensations to him for doing things in the national interest which he would be unable to do alone.

The problem of soil wastage is intimately bound up with the problem of flood control. Inadequate soil cover, lack of moisture, and the cultivation of steep places and slopes increase the momentum of water movement, thus intensifying the destructiveness to the soil. Too many farmers have viewed the farm problem of floods as an engineering problem, and the fact that the farmers themselves might play a real service in flood control has seemed remote. Floods have caused the farmers great losses in property as well as in human suffering. Crops have been ruined, bridges destroyed, livestock drowned, and millions of tons of fertile soil have been washed away. The cost of all this wastage has amounted to millions of dollars annually. In 1936 the Federal government assumed some responsibility for coordinating

\textsuperscript{14}Glover, \textit{op. cit.}, p. 9.
activities designed to overcome threats of floods and soil erosion when it adopted the Flood Control Act. The investigation of waterways for flood control was placed under the jurisdiction of the Department of War and the prosecution of the flood-control measures was placed under the control of the Department of Agriculture. Ten million dollars was appropriated to the departments to engage in "upstream engineering." This takes the form of various land-use measures, supplemented by minor engineering works to lessen the aggregation of floodwaters in destructive volume.15

Congress met in special session in the fall of 1937 to enact new farm legislation. In February, 1938, the Agricultural Adjustment Act was passed, continuing the farmers' conservation program with repayments for replacing soil depleting crops with soil conservation crops. Four regional laboratories were created to encourage new industrial uses for farm products.

That the Bankhead-Jones Act passed in July, 1937, attacked the farmers' problem directly is indicated in the following comment:

The Bankhead-Jones Farm Tenant Act authorized and directed the Secretary of Agriculture to develop a program of land utilization, including the retirement of lands which are submarginal or not primarily suitable for cultivation in order to correct maladjustments in land use, and thus assist in controlling soil erosion, reforestation, preserving material

resources, mitigating floods, preventing impairment of dams and reservoirs, conserving surface and sub-surface moisture, protecting watershed of navigable streams, and protecting the public land, health, and welfare. 16

The purpose of this program is to remove from cultivation land which is not good enough to farm, but which will contribute to the good of the community if properly used. Approximately 11,000,000 acres of land have now been acquired under the submarginal land program and converted into pastures, ranges, forests, wildlife preserves, and public recreational areas.

Another epochal step in the history of soil conservation was the passage by a number of states of soil conservation district laws, Arkansas taking the lead in 1937. Under these state authorizations, such districts have been established in many parts of the country, comprising many millions of acres.

The fact that soil conservation has become one of the major goals of agriculture is due primarily to the farmer himself, who has awakened to the need of protecting the productivity of his land. Today the government no longer needs to carry the idea of soil conservation to the farmers, for the farmers themselves are now taking the initiative in soil conservation work. Today more than six million farmers are working in cooperation with Federal, state, and

16 Department of the Interior, Achieving a Balanced Agriculture, p. 15.
local agencies to secure a better balanced agriculture. They are working to conserve indispensable agricultural resources as well as to secure better balance between agriculture and the business world.

In spite of this progress, soil depletion continues at a more rapid rate than restoration. Agricultural producing power is still greater than the market outside for these agricultural products; yet millions of people in the United States are unable to buy all the agricultural products they need for diet and health.
CHAPTER III

FORESTRY AND GRAZING

Young though she is in the sisterhood of nations, the United States has always been proud of her progressiveness. Yet, in many ways, she has been the laggard child. Effective conservation of forestry may be cited as a specific instance in which the nation has been outdistanced by Germany, Finland, France, and other European countries. The young country was so busy growing that she took no cognizance of the fact that her rapid expansion was just as rapidly depleting the supply of virgin timber and destroying the value of the forests as grazing lands, game and fish reserves, and reservoirs for moisture. However, in the last quarter of the nineteenth century, Americans began to realize the devastating effects of their negligence.

The first significant indication that public interest in forestry was beginning to awaken was in 1875. In that year a group of influential citizens who were interested in inaugurating a forestry movement met in Chicago. The primary result of this meeting was the organization of the American Forestry Association, which had as its purpose the promotion.
of publicity and public appreciation of scientific forestry and timber culture.

It would seem that all the movement needed was this little push to get it started; for, once started, it gained momentum rapidly. Efforts on the part of Franklin B. Hough, a former member of the American Association for the Advancement of Science, resulted in Congressional establishment of the Division of Forestry in the Department of Agriculture in 1881.¹ Ten years later the movement was advanced a step further when Congress authorized President Benjamin Harrison to set aside forest lands from the public domain as reserves, which step led to the subsequent creation of the National Forest Reserve System.

Among the heroes, sung or unsung, who helped preserve this nation as one of those with boundless resources, Gifford Pinchot deserves a place of honor. In view of the individual results of his efforts, it might be well to mention some of Pinchot's background and training for the part he was to play; for that part made the name of Gifford Pinchot and the Division of Forestry practically synonymous.

After graduating from Yale University, Pinchot studied forestry in France, Germany, Switzerland, and Austria. This training was supplemented by his experience as a forester.

¹Department of Agriculture, Highlights in the History of Forestry Conservation, p. 3.
for the Biltmore Estate in North Carolina and extensive travel as a member of the National Academy of Science Commission on the forestry situation. As a special agent for the Department of the Interior, he became familiar with the problems of forest reserves. This training, together with Pinchot's driving desire for public service, his youth, and his natural ability to organize, fitted him for the position he was to assume. Too, the fact that he was independently wealthy enabled him to devote much time to forestry.\(^2\)

Because of their similar personalities, Pinchot and Theodore Roosevelt made a very efficient team, the former furnishing the requisite knowledge and the latter furnishing the executive authority. Theodore Roosevelt in his message to Congress on December 2, 1901, laid the foundation for the future of forestry in these words: "The forests and water problems are perhaps the most vital problems in the United States."\(^3\) This passage formulated the future forestry program and accounted for the rapid progress in this field during the next seven and one-half years.

In 1902 the Bureau of Forestry, which had been created by Congress, was a small organization under Gifford Pinchot, occupied mainly with laying the foundation of forestry by

\(^2\)Department of Agriculture, Forest Conservation in the Social Studies and Sciences, p. 48.

\(^3\)Theodore Roosevelt, Autobiography, p. 387.
scientific study of the forests. The government forest reserves were in charge of a division of the General Land Office, few if any of the personnel of which had ever seen a foot of the timber land for which they were responsible. Thus the reserves were neither well protected nor well used. There were no foresters among the men who had charge of the national forests, and no government forests under the direction of the trained government foresters. All the forests which belonged to the United States were held and administered in one department, and all the government employees who were trained for this work were in another department. 4

The foolishness of continuing to separate the forests and the foresters brought about the Act of February 1, 1905, which transferred the national forests from the Department of the Interior to the Department of Agriculture and resulted in the creation of the United States Forest Service. This Federal agency is charged with the responsibility of promoting conservation, protection, and the wise use of forest resources. Its activities embrace four major fields of work:

(1) the administration of the national forests and publicly owned forest land bought by the Federal Government; (2) cooperation with the state and private landowners in securing protection from fire, in reforestation, and in management of forest lands;

4 Joseph Gaer, Men and Trees, p. 63.
(3) conducting forest research to discover improved methods and practices in protection, management, and efficient utilization of forest resources; and (4) gathering and disseminating public information concerning forest and related subjects. 5

The Forest Service is concerned with the development of national forests so that they may continue their benefits to mankind. "Lumber, a by-product of wood, is a source of cellulose, lignin, turpentine drugs, rayon, plastics, films, dye, alcohol, gas for automobiles, and food for cattle. 6 In addition to timber the forests have other natural resources, namely, grazing lands, hydro-electric power sites, mineral deposits, game and fish, and sites for storage reservoirs for irrigation.

They are as important to mankind as conservators of water as they are for the protection of timber. The protection of watersheds affords an abundant water supply which is essential to life. Adequate watershed protection gives an abundance of water for protection in homes, for irrigation of cultivated fields, and for river navigation. Power for many industries and the supply of water for many cities find their sources on forested slopes. In retarding the rapid run-off, forests play a very significant part in water conservation. The humus and litter on the forest floors have great absorptive power, and the shades of the forest retard the flow of the melting snow. Under this

5Elliott, op. cit., p. 240. 6Ibid., p. 242.
natural regulation the forest cover helps hold down the
crest of the floods and makes floods less destructive.
Forest work for flood control involves the planting of
grasses as well as shrubs. Forests are one of the best pro-
tections against erosion. Their foliage breaks the force
of the wind; their fallen leaves form a blanket which soaks
up the water and checks run-off. Too, they have other
protective functions: they serve to prevent land slides and
snow slides; they protect homes, fields, and orchards from
destructive winds; and in certain sections they give perma-
nent form to sand dunes which otherwise would be shifting
from place to place, burying fences, roads, and obstructing
traffic on highways and railroads. As a source of inspira-
tion forests foster cultural and spiritual values and in
this way help to conserve human resources.7

The year 1907 was a red-letter one in American forestry.
The name "forest reserves" was eliminated, and the units be-
came "national forests" under the administration of Gifford
Pinchot, the First Chief Forester of the United States
Forest Service. He remained in this position until 1910,
when he was removed for opposing the efforts of Richard A.
Ballinger, Secretary of the Interior, to break down the
conservation policies of Theodore Roosevelt.

In the same year Senator Fulton of Oregon attached an

7Ibid., p. 13.
amendment to the appropriations bill for the Department of
the Interior prohibiting the President from setting aside
more national forests in the six western states of California,
Oregon, Washington, Idaho, Montana, and Wyoming. For four
years the Forest Service had been examining public data con-
cerning which areas should be placed in the public forests.
As a consequence of this study, a plan had been submitted to
Theodore Roosevelt to set aside as national forests 16,000,000
acres of land in the above six states. The President was
quick and signed a proclamation setting aside the land
before he approved the appropriations bill for the Depart-
ment of Agriculture. By this quick action on his part he
outwitted the enemies of conservation and saved 16,000,000
acres of public land for the national forests. In his own
characteristic way, Roosevelt remarked: "The opponents of
the Forest Service turned handsprings in their wrath." 3
Under his able administration the national forests were en-
larged by presidential proclamation from 46,153,119 to
194,500,043 acres, a splendid addition of 148,346,925 acres
during his term.

An important step in the public forestry policy was
inaugurated when Congress passed the Weeks Law of 1911.
First, cooperation between state, Federal, and private own-
ership was provided. This act marked the beginning of the

3 Parker and Whitaker, op. cit., p. 6.
first fifty-fifty Federal aid acts. Second, the act provided for the purchase of the forest properties on the watershed of the national forests in the East. Third, the National Forest Reservation Commission was established to handle the land thus acquired. Within twenty years after the enactment of this law, the area of Federal-state protected forests had reached 227,000,000 acres, and by 1936, thirty-nine states, Hawaii, and Puerto Rico had forestry agencies.

The World War originating in 1914 emphasized the need of forest research, and in 1915 a Branch of Research was established in the Forest Service. This action unified the program of attack on the problems of American forestry.

The forest reserves include great open spaces of grass and other forage plants. These areas, once used without charge by stockmen, had to be put under government regulation, because more cattle and sheep were being placed upon the grazing areas than the forage could keep. In 1906, Pinchot, Chief of the Forest Service, set up a grazing fee on the forest reserves as a basis of regulation. The stockmen vigorously opposed this fee, but Pinchot stood firm and won recognition for the justice and legality of his fee. It is interesting to note that by 1911 the stockmen's organizations, which had been formed for protection against the range restrictions, were won over and were cooperating
with the Forest Service. Further impetus was given grazing restrictions by the Taylor Grazing Act of 1934. It set aside 142,000,000 acres of public domain for grazing control to prevent the threatened further destruction by over-grazing, to promote orderly use, improvement, and development of the range, and to stabilize the livestock industry dependent upon the public land. By 1940, another 134,000,000 acres of state and privately owned land had been set aside by the Taylor Grazing Act and had been included in the fifty-three Federal grazing districts located in ten states of the West: Arizona, California, Montana, Nevada, New Mexico, Utah, Idaho, Wyoming, Oregon, and Colorado.\textsuperscript{9}

These ten states raise one half of the sheep and one fifth of the cattle produced in the United States, providing a meat supply that is vital to our national defense.

The tremendous achievement of the Grazing Service is due to a policy of "home rule" on the range. According to this practice, advisory committees of stockmen in grazing districts are elected to issue grazing licenses and rules of fair practices in each district. Under this licensing system,

\textsuperscript{9}Department of the Interior, \textit{The Building of the Federal Range}, p. 2.
month for sheep and goats. One-half of the total collection is returned to the States for schools, roads, and range improvements, in the counties from which it is collected; one-fourth is allocated for expenditures by the Secretary of the Interior for construction, purchase, or maintenance of range improvements, and the other one-fourth is paid to the United States Treasury. The Grazing Service collects fees roughly amounting to one million dollars annually. 10

In addition to activities which involve issuance of grazing licenses, thereby preventing over-grazing by 11,000,000 head of livestock, the Grazing Service is carrying forward a broad program of range improvements, including construction of stock and truck trails; development of springs, wells, and other watering facilities; rehabilitation and improvement through reseeding crops on the range, and the extermination of harmful rodents and poisonous weeds from wide areas on the range side. 11

The Pierce Act of June 23, 1936, authorizes the Secretary of the Interior to lease on behalf of the United States, state, county, corporation, and private lands in grazing districts which have been determined by him to be chiefly valuable for grazing. Leases of state and county tax-delinquent land under this act involving about 11,000,000 acres are being negotiated in nine western regions. 12

One of the most serious obstacles to successful forestry is the annual loss from forest fires, which is estimated at $60,000,000. This vast sum represents only the value of the timber destroyed. Forest fires cause thirteen other equally significant losses:


11 A. C. Barkley, "Seven Years of Conservation," Congressional Record, March 7, 1940, p. 2.

They waste valuable timber; destroy young trees and plants; retard the growth of the remaining trees; kill wild life; deprive game of shelter; increase the soil erosion; start destructive floods; contribute to irregular stream flow; sap soil fertility; mar the beauty of the landscape; reduce recreation areas; and endanger human life.\(^{15}\)

The exploitation of forests, in fact, if continued during the next fifty years at the rate of the last half century, would have resulted in the grim reality expressed in the poem, "The Spendthrift," by Robert Reese:

\[
\begin{align*}
\text{My squandered forests, hacked and hewed,} \\
\text{Are gone; my rivers fail;} \\
\text{My stricken hillsides, stark and nude,} \\
\text{Stand shivering in the gale.} \\
\text{Down to the sea my teeming soil} \\
\text{In yellow torrents goes;} \\
\text{The guerdon of the farmer's toil} \\
\text{With each year lesser grows.} \quad ^{14}
\end{align*}
\]

The Clark-McNary Act passed in 1924 broadened the scope of Federal aid in fire protection and authorized the Federal government to cooperate with the states in the production and distribution of planting stock for farm forestry. Forty-two states of the Union and Hawaii were cooperating enterprises by 1935.

The McNary-McSweeney Act of 1928 authorized the establishment of a series of regional forest experiment stations to encourage research in the field of forestry. The Forest Service maintains twelve forestry experiment stations and a Forest Products Laboratory located at Madison, Wisconsin, to carry on this research. As a result, forest research

\[^{15}\text{Elliott, op. cit., p. 254.}\]

has made rapid strides in the Federal field, in private
schools and in states, and under private endowment.

The Division of Grazing has carried out a program of
educational training for its enrollees in the Civilian
Conservation Corps camps. "Their activities range from
fighting fires to fighting grasshoppers." During severe
snowstorms the boys have rendered assistance to stranded
cattle by breaking trails and making it possible to haul
food to them. Throughout the range territory the boys also
render first aid to humanity by breaking snow-blocked trails
and searching for citizens who have met with some mishap.

The Civilian Conservation Corps, with camps located
on national forests, Indian reservations, and on private
lands, in its first four years built 69,000 miles of roads
through forests, secured away the inflammable underbrush
from more than a million acres, built fire towers, col-
lected hundreds of thousands of pounds of seeds, planted
two billion trees, built twenty-two nurseries, and carried
out forestry work on three million acres of forest land.
Further work in the forests included forest culture, preven-
tion of erosion, reforestation of denuded areas, preserva-
tion of woods from pests and diseases, construction of
trails and lookout houses, and training for fire fighting.

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Congressional Record, July 1, 1940, p. 30.
With the use of the Civilian Conservation Corps funds, 7,436,321 acres were added to the forest lands.

Another phase of forestry, not so romantic perhaps, but none the less important in the economy of the nation, is known as farm forestry. Farm woodlands comprise one third of the total forest land area of the country, and as a cash crop they produce an important part of the national income, occupying ninth place and bringing in sixty-three million dollars annually to more than two and one-half million farm families.

Out on the Great Plains such physical factors as high winds, high temperatures, hails, blizzards, and droughts have resulted in crop failures, human distress, and a national contribution of several billions of dollars for recovery and rehabilitation in the past eight years. The frequently recurring crop failures, accelerating wind erosion as evidenced by unprecedented dust storms, and increasing general distress among the rural population made it obvious that action had been too long delayed; that among other things a real effort would have to be made to put farm forestation upon a workable basis if the region was to be saved from economic and social deterioration. Also due to the economic depression there was labor in large volume which must be employed in public works and which was readily available for an enterprise of this nature. It was for
this section that in August, 1934, at Lincoln, Nebraska, a Shelter Belt Project was inaugurated at a cost of $75,000,000. On March 19, 1935, the first tree was planted near Mangum, Oklahoma, an Austrian pine seedling planted on the farm of M. E. Curtis -- the forerunner of 84,000,000 trees and shrubs. 16

In May, 1937, the passage of the Cooperative Farm Forestry Act broadened the scope of the program, and the Shelter Belt Project was renamed the Prairie States Forestry Project. In order to avoid too wide diffusion of effort at the outset of the program and to obtain as quickly as possible the benefits of group planting, a definite strip through eastern North Dakota and South Dakota and in western Nebraska, Kansas, Oklahoma, and Texas was begun.

The shelter belt planting program operates on a strictly cooperative basis, the farmer and the government sharing the cost of establishing the trees. The Forest Service grows or buys the seedling trees and plants them in the belts, utilizing relief labor for the purpose, while the farmer prepares the planting site, furnishes the fence, and controls rodents. The farmer is required to sign a simple cooperative agreement covering the care to be given the plantation, and the trees become his property once they are planted.

16 Department of Agriculture, Highlights in the History of Forestry Conservation, p. 6.
This project has planted more than 16,101 miles of shelter belts, of which nearly 96.8 per cent are being maintained by the farmers. Progress to August 1, 1941, on this project is indicated in this chart:

<table>
<thead>
<tr>
<th>State</th>
<th>Miles of Shelter Belt</th>
<th>Number of Farms Served</th>
<th>Number of Trees Planted</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Dakota</td>
<td>2,096</td>
<td>3,169</td>
<td>30,478,755</td>
</tr>
<tr>
<td>South Dakota</td>
<td>2,867</td>
<td>5,251</td>
<td>36,381,659</td>
</tr>
<tr>
<td>Nebraska</td>
<td>3,697</td>
<td>6,170</td>
<td>39,870,980</td>
</tr>
<tr>
<td>Kansas</td>
<td>2,960</td>
<td>4,943</td>
<td>34,134,641</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>2,788</td>
<td>4,750</td>
<td>27,261,284</td>
</tr>
<tr>
<td>Texas</td>
<td>1,693</td>
<td>2,692</td>
<td>19,746,219</td>
</tr>
<tr>
<td>Total</td>
<td>16,101</td>
<td>26,375</td>
<td>187,905,538</td>
</tr>
</tbody>
</table>

The value of the Prairie State Forestry Project is found in the terms of the results it achieves. Shelter and shade for human beings and for stock, nesting places for birds that are so useful in the destruction of insect pests, protective cover for game birds and animals, the protection of crops from the withering hot winds, the conservation of moisture -- all these follow directly after the establishment of shelter-belt trees. The esthetic value of long belts of trees in areas which for decades have been treeless is immeasurable. Their presence instills a sense of comfort. They stand out like sentinels, at once a sign of stability and an indication of pride in ownership.

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17Department of Agriculture, The Prairie States Forestry Project, p. 4.
About thirty per cent of the forest area of continental United States is included within the boundaries of farms. In large areas these important resources have been wastefully used, partially through ignorance on the part of the farmer and partially because of economic pressure on the farmer for the realization of an immediate income. In recognition of the important public interest involved, the Cooperative Forestry Act passed in 1937 aims to provide a comprehensive program of assistance to farmers in making more effective use of their woodlands. The act strengthens and extends arrangement for supplying farmers with technical knowledge and furnishing them with seedlings and other planting stock. An appropriation of $2,500,000 annually is authorized for this purpose.\(^{18}\)

If the tree-planting program now being instituted had been accomplished fifty years ago, untold millions of dollars worth of permanent damage to the soil would have been avoided, thousands of farm families would have been prosperous instead of destitute, and the nation would be in a much better situation in regard to future food surplus.

\(^{18}\)Department of Agriculture, *Intensive Projects under the Cooperative Farm Forestry Act*, p. 5.
CHAPTER IV

WILDLIFE AND SCENIC BEAUTY

An abundance of wildlife in America was conducive to the development of our unique civilization. The Indians, the original Americans, by taking only what animals they needed to exist, were ideal conservationists. In contrast, the wildlife found by our forefathers furnished them with food and clothing and became the first source of fur trade, the first organized commerce in America. Thus, for two centuries following the first permanent settlement on the continent, wildlife was wantonly slaughtered. The pioneer considered the abundance of wildlife his natural inheritance to be used as his own will. A few men made incredible fortunes in trapping animals for fur or in killing them for meat. As a consequence of this undisciplined destruction, several species of birds were entirely wiped out, and many animals were reduced to pitiful remnants of their former number. A few Americans awakened to the fact that wildlife was fast vanishing, but found that though the essentials of wildlife management are relatively simple, they are difficult to put into effect, owing to public apathy,
sheer ignorance or misunderstanding, misguided sentiment, and politics. Theodore Roosevelt, realizing that a well-informed public can overcome the inertia and prejudice that tend to paralyze conservation efforts, began legislation toward that end.

Congress recognized the need for legislation and passed the Lacey Act in 1900. Its enactment prohibited the interstate transportation of certain types of game birds, and land mammals, except under regulations promulgated by the Secretary of Agriculture. This was the beginning of the Federal interest in the preservation and perpetuation of wildlife. From the time of the Lacey Act in 1900, a number of congressional laws resulted from activities on the part of various groups. The Game Export Law for the Territory of Alaska was enacted in 1902 and resulted in the regulations concerning the exportation of the heads of big game as trophies and put an end to the slaughter of deer for hides along the southern coast of Alaska. In the same year an appropriation was made for the preservation of buffaloes, and a herd of buffaloes was established in Yellowstone National Park. The first national game preserve was the Wichita Game Preserve, created by an act of Congress on January 24, 1905.\(^1\) In 1908, 1,200 acres of this preserve

were enclosed with a woven wire fence for the reception of a herd of fifteen buffaloes donated by the New York Zoological Society. An act of June 29, 1906, provided for the establishment of the Grand Canyon Game Preserve of Arizona, comprising 1,492,928 acres. These years, therefore, marked the beginning of a national conservation conscience.

Conservation extended not only to the preservation of wildlife, but it became equally concerned with the preservation of the scenic features of our country. In this field of conservation, the protection of the superb scenic wildernesses and the areas steeped in the drams of the past, the United States has led the world. The first national park was Yellowstone, established by an act of Congress in 1872. For eighteen years Yellowstone was the only national park. During the first twenty-five years of its history, many questions regarding the set-up for its administration came up in Congress, and policies were established which have since applied to other national parks. The merit of Yellowstone as a national reservation did much to stimulate the general policy of Federal control of superlative areas.

The Antiquities Act of 1906 authorized the President to establish by proclamation national monuments comprising areas of national significance in the scientific, historic, or prehistoric field. The determining factor in the preservation of a historic site by the national government, as in
the case of any areas of great scenic or scientific interest, is that it possess certain matchless or unique qualities which entitle it to a position within the first rank of historical sites. As a result of the Antiquities Act, there are today eighty-two national monuments. Among the monuments which attract the greatest number of visitors are the Aztec Ruins and the Cliff Dwellers' Ruins in New Mexico; Craters of the Moon in Idaho; Muir (Redwood) Groves and the Joshua Tree in California; Natural Bridges in Utah; Petrified Forests in Arizona; and the Statue of Liberty in New York City.² National monuments are important as wildlife refuges. These areas, providing grounds in specialized protection and wildlife management, are reservoirs for game overflow production and are used in rehabilitating wildlife in other areas in need of stocking. Among the monuments which are important refuges for game are Muir Woods, Pinnacles National Monument in California, and Mount Olympus National Monument in Washington.³

In March, 1904, the Federal government started the present refuge system by creating the Pelican Island Bird Refuge in Florida. President Theodore Roosevelt by executive orders established a number of refuges from land in the public domain and made some of the western

²World Almanac, 1941, p. 620.

reservations inviolate sanctuaries for wild fowl and birds. These refuges function to preserve wildlife by establishing a continuous breeding stock from which restorations can be made. If they are numerous enough, auspiciously placed, and properly managed, they are a more or less safety factor for breeding stock.

By March 4, 1909, fifty-one national bird reservations distributed in seventeen states and territories from Puerto to Hawaii and Alaska had been created. An act of May 23, 1909, made the Niobrara Military Reservation in Nebraska a bird reservation.

The National Park Service has occupied a unique position in the field of conservation since its establishment as a Bureau of the Department of the Interior by an organic act of August 25, 1916. The basic principles of complete protection of all life, as practiced in the national park areas, is stated in the National Park Service Act of August 25, 1916:

The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations, hereinafter specified by such means and measures as conform to the fundamental purposes of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide the enjoyment of the same in such manner and by such means as will leave them unimpaired for the equipment of future generations.\(^4\)

This service works for the preservation of the woodlands.

that are valuable for educational, scientific, and inspirational purposes. Throughout the national park areas, the theme of the administration is the same -- the wilderness conditions must be held inviolate. At the present time the areas administered by the Federal Park Service in the forty-eight states are described as follows: twenty-six national parks, four national historical parks, eleven national military parks, eighty-two national monuments, seven battlefield sites, eleven national cemeteries, eight miscellaneous national memorials, one national recreational area, three national parkways, and the system of National Capital Parks.\(^5\)

The total area of the Federal Park System, April 15, 1940, was 21,534,377 acres. The total area of Alaska is 388,165,377 acres, of which 27,638,378 acres are reserved as national parks. In Hawaii there is a national park area of 156,800 acres.\(^6\)

On July 3, 1918, pursuant to a treaty between the United States and Great Britain, Congress passed an act for the protection of birds migrating between the United States and Canada. The Federal government, by the treaty, was given the authority to control and administer the migratory bird resources, which included all birds stationed between the United States and Canada. This act provided there

\(^5\) *World Almanac*, 1941, p. 620.

\(^6\) *Natural Resources Board, Recreational Use of the Land of the United States*, p. 18.
should be full cooperation between the states and the Federal agencies, and is intended to secure a greater uniformity of administration and protection of the birds of the two nations. It was a sort of Magna Charta to the migratory birds of America.7

From 1920 to 1930 a number of proposals for the conservation of wildlife were made in Congress. Voluminous hearings resulted in the enactment on February 18, 1929, of the Norbeck-Anderson Act, which authorized appropriations for a wildlife refuge program over a ten-year period. However, appropriations were never made as contemplated. The result was that during this decade there was a decline in wildlife species. The first evidence of the character of the newly recognized responsibility on the part of the Federal government appeared when on April 17, 1930, the United States Senate appointed a special committee on the Conservation of Wildlife Resources and authorized it to study the matter and to make suitable recommendations. A committee of five was appointed. The committee felt that before introducing legislation, it should be fortified with the best information obtainable on the several plans of this problem.8 To this end the committee began a series of hearings


8Statutes at Large, XLIV, 1222.
covering among other subjects waterfowl shortage, grazing sheep on the public domain, the whaling industry, and the elk problem. Some of the revelations of this survey were:

At one time the United States was the world's chief source of fur supply, but owing to lack of conservation methods today the United States does not produce enough to meet more than half her needs. There are about 6,000,000 big game animals in the United States while a hundred years ago there were nearly ten times that number of buffaloes alone. 9

The fishing grounds of Alaska were being destroyed until the passage of the Alaskan Fisheries Conservation Bill in 1924. According to this act the Pribilof Islands off the coast of Alaska were set aside for the conservation and utilization of fur seals. This island became a seal's paradise, as coast guard patrols follow the herds in their northwesterly migration and stand by to protect them. Since the seals spend most of the portion of each year in Canadian and Japanese waters, fifteen per cent of the net proceeds of the sale of the skins goes to Canada, fifteen per cent to Japan, and the remaining seventy per cent to the United States. This conservation measure increased the seal herd off Pribilof Islands from 130,000 to 2,020,000 by 1940.

The Migratory Bird Conservation Act of February 18, 1929, was passed to meet more effectively the obligation

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9 Department of the Interior, The Resources We Guard, p. 9.
of the United States under the migratory bird treaty with Great Britain by lessening the dangers threatening migratory game birds from drainage and other causes, and by the acquisition of areas of land and water to furnish in perpetuity reservations for the adequate protection of such birds. It authorized appropriations for the establishment of such areas.

An executive order of June 10, 1933, greatly increased the work of the National Park Service by transferring to it the parks, monuments, and cemeteries and memorials from the War Department and the national monuments from the Department of Agriculture. It further increased the primary functions of the service by entrusting it with the administration of the public parks within and contiguous the District of Columbia, and certain other public buildings, both within and outside the District.10

The national parks have been set aside primarily because of superlative features of great value. Some of the chief features that are represented and examples of parks containing these features are shown in the following list:

Topography:

Mountains -- Mount McKinley, Glacier, Yosemite, Sequoia, Rocky, Grand Teton, and Mount Ranier.

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10Natural Resources Board, Recreational Use of the Land of the United States, p. 65.
Canyons -- Grand Canyon, Yosemite, Zion, and Yellowstone.

Lakes -- Crater Lake, Yellowstone, and Glacier.

Geology:

Volcanic -- Hawaii and Lassen.

Caves -- Carlsbad Caverns.

Biology:

Animals -- Yellowstone, Mount McKinley, and Yosemite.

Forests -- Sequoia, General Grant, Yosemite, and Glacier.

History:

Explorations, discovery, and military -- Verendrye, Cabrillo El Morro, Scott's Bluff, Gran Quivira, Colonial National, Morristown, Gettysburg, Chickamauga, Chalmette, and Appomattox.

Famous people -- George Washington's birthplace and Abraham Lincoln's birthplace.

Antiquity:

Ruins -- Casa Grande, Navajo, and Bandelier.

Mounds -- Mount City Group.

All the national parks and monuments are sanctuaries for wildlife, and several of them are noted for the species that may be seen there. Yellowstone National Park is known as a wildlife sanctuary because of its buffaloes, elk, black bear, mountain sheep, and antelope. Elk are numerous in
Rocky Mountain and Yellowstone National Parks. Moose are found in Glacier, Grand Teton, and Yellowstone Parks. Mount McKinley is celebrated for its Dall sheep and caribou. Olympic Park is famous as the summer feeding ground for the rare Roosevelt elk.

Many of the parks are noted for their scenic interests. Mount McKinley National Park contains the highest peak in North America. Death Valley National Monument contains spectacular desert scenery, together with the lowest land elevation on the continent. Hawaii has the most active volcanic area within the nation's possessions. Grand Canyon is a stupendous example of the power of erosion. Bryce Canyon has the best exhibit in the world of the vivid coloring of earth's material. Mammoth Cave contains spectacular onyx cave formations. It became nationally famous in 1812 when saltpeter from the cave was used in making gunpowder. Mesa Verde is the most notable and best preserved region of prehistoric cliff dwellings in the United States. Sequoia, better known as the Big Tree National Park, contains scores of sequoias twenty to thirty feet in diameter.\footnote{Ibid., p. 73.}

The year 1934 was well filled with activities relating to wildlife conservation. The Coordination Act paved the
way for close cooperation between the government wildlife agencies and those engaged in public works. It authorized the coordination of all Federal activities dealing with wildlife and established the Biological Agency as the principal agency available for consultation and the one responsible for technical advice concerning wildlife on Federal projects. Today no great Federal project is undertaken without ascertaining its effect upon wildlife. An illustration of this is the construction of a fish ladder across Bonneville Dam on the Columbia River in Oregon. Due consideration had been given to the annual run of salmon on the Columbia River. It is impossible to estimate the ultimate good that will come to the wildlife resources from the influences exerted and the forces that have been organized and released by provisions of the Coordination Act.

The National Forest Refuge Act, enacted March 10, 1934, empowered the President by an executive order to set aside in the national forests refuges for fish and game. Within our national forests are areas where wildlife should be given an opportunity to be un molested and free from pursuit. Today there are thirty-two Federal Game Refuges within the national forests, totalling 1,824,000 acres.13

The Duck Stamp Act of 1934 provided that every gunner for waterfowl in addition to his state license must carry

on his person a Federal license or duck stamp purchased at any post office for one dollar. This money is placed in a migratory bird conservation fund and is used solely for the construction of inviolate sanctuaries. Since the law was enacted, duck stamps have been sold each year as follows:

1935.............. 635,001
1936.............. 456,204
1937.............. 603,623
1938.............. 733,039
1939.............. 1,002,715
1940.............. 869,732

Purchased from the sale of the duck stamps and appropriations, migratory bird refuges, numbering fifty-nine, have been created to protect the breeding grounds and to provide resting places along the flyways. Under the auspices of this law, almost 2,000,000 acres have been set aside as refuges for ducks and geese on their journeys between their summer and winter quarters.

Some of the most important of these havens are the White River Migratory Refuge in Arkansas, the Okifenokee Wildlife Refuge in Georgia, the Sabine Migratory Waterfowl Refuge in Louisiana, the Railroad Valley Migratory Bird Refuge in Nevada, and the Malheur Migratory Bird Refuge in Oregon.\(^\text{15}\)

The Federal government for a number of years has imposed a tax of ten per cent on the sale of all sporting arms and ammunition. This tax, while paid by the manufacturers, has been passed on to the consumer sportsmen in

\(^{14}\)Ibid., p. 10. \(^{15}\)Elliott, op. cit., p. 84.
the purchase price of his rifle, shells, etc. While the amount paid by each purchaser is small, yet in the aggregate it has produced a considerable amount paid into the Treasury of the United States. Sponsored by the Special Committee on the Conservation of Wildlife Resources of the Senate and the Select Committee on the Conservation of Wildlife in the House of Representatives, the act establishing this excise is known as the Pittman-Robertson Act in honor of the chairmen of the respective Congressional committees. The bill earmarks a ten per cent excise tax on sporting goods and ammunition in a separate fund in the United States Treasury to be allocated to the states annually, taking into consideration the areas of the states as compared with the total area of the United States. Each state must qualify to participate in the Federal aid by passing an enabling act giving consent to the legislation. Eligibility of the states is attained only when they have assented to provisions of this act and have passed laws for the conservation of wildlife which include a prohibition against the diversion of the license fees paid by hunters for any other purpose than the administration of the said fish and game departments. Forty-three of the forty-eight states have passed the necessary consent legislation and are now eligible to participate in the allocation of these funds. The five states that are not qualified are Montana,
Nevada, Georgia, Florida, and Louisiana. The forty-three states have submitted 160 projects to which the Federal government contributes seventy-five cents and the state twenty-five cents of each dollar required to complete a project. As a result of this program, some very worthwhile projects have been initiated to provide additional lands dedicated to the needs of wildlife.\(^1\)

The Taylor Grazing Act of 1934 provided that many of our finest game species -- big-horn mountain sheep, antelope, elk, and sage-grouse -- should occupy the 142,000,000 acres of the public domain. In issuing a call for the North American Wildlife Conference late in 1935, President Franklin D. Roosevelt said:

> It is my purpose to bring together individuals, organizations, and agencies interested in the restoration and conservation of wildlife resources. My hope is that through this conference new cooperation between public and private interests, and between Canada, Mexico, and other countries will be developed; that proposals existing between states and the Federal governmental agencies and conservation groups can work comparatively for the common good.\(^2\)

The conference held in Washington, D. C., on February 3-7, 1936, was most beneficial. Representatives attended from every state as well as from Mexico and Canada.

\(^1\)Conservation of Wildlife, Hearings before the Select Committee on Conservation of Wildlife, p. 297.

The benefits flowing from the exchange of ideas, the technical papers read, and the discussions have been of profound importance to the conservation movement. The conference had two significant results. It marked the undertaking of a federation representing all the kindred conservation interests, and it developed for the country the first national wildlife restoration program. The previous policy had been to recognize an emergency some months after it occurred. Then -- as was the case with the passenger pigeon, the heath hen, and other wildlife -- it was too late.

National Wildlife Restoration Week, the third week in March, was proclaimed by President Roosevelt in 1936. This is an established annual event for publicizing conservation. Through the press, radio, schools, and by Presidential proclamation, the attention of the entire country is called to the need for uniting all the efforts of all friends of outdoor America to the end that future generations shall have their rightful heritage of wildlife. As an outgrowth of Wildlife Week, there are 36,000 organizations interested in wildlife protection, ranging from local Kiwanis clubs to such specialized groups as the American Bison Society.

Research is considered a vital factor in the preservation and restoration of wildlife resources. Former Senator Harry P. Hawes introduced a bill to provide an experimental station near Washington. The Resettlement Administration
secured title to considerable acreage in Prince Georges and Anne Arundel counties in Maryland which was transferred to the Biological Survey by an executive order, December 16, 1936, and established as Patuxent Research Refuge. Here experiments are carried on in food and cover conditions to demonstrate to farmers the methods by which wildlife species may be managed. Ruffled grouse, wild turkeys, and white-tailed deer are being restored to this area. This wildlife research station, the first of its kind, was a manifestation of a national ability to conserve and administer wisely the organic resources of the soil.18

The exchange of ratification and proclamation on March 15, 1937, of a convention between the United States and Mexico provided protection to migratory birds and regulated shipment of game animals between the two countries.

The Civilian Conservation Corps plays an important part in the restoration, conservation, and increase of the nation's wildlife resources. By using the funds of the Civilian Conservation Corps, 65,511 acres have been set aside for wildlife protection, and 119,214 acres have been added for national parks. Practically every camp and every man enrolled therein made some contribution which affected the wildlife situation. Beginning October 1, 1939, camps were assigned to thirty-five national wildlife refuges.

through a program worked out by the Biological Survey and the Civilian Conservation Corps. Among the camp activities directly calculated to restore favorable conditions for birds, mammals, and fish are food and cover planting, breeding and stocking fish, stream improvement, and the gathering, storing, and replanting of aquatic and upland vegetation. The indirect wildlife activities include work in fire suppression, reforestation, erosion control, and revegetation. The enrollees have planted marsh and swamp vegetation, built windbreaks and protective wildlife covers, and scattered seeds. Since Civilian Conservation Corps enrollees work with wildlife and are close to it, they contribute a youthful attitude toward the problem and constitute an enthusiastic body of informed public opinion on wildlife such as never before existed in the United States.

A special agency of the Federal government for the conservation of wildlife resources was established June 30, 1940, and was entitled the Fish and Wildlife Service. This organization consolidated the work of the Bureau of Fisheries and the Biological Survey.

This Service conducts biological surveys, field investigations, and laboratory studies of the distribution, migration, classification, natural history, taxonomy, food habitats, food resources, and diseases of wildlife, and carries on experiments with the breeding, feeding, and management of wild fur animals and domesticated rabbits.19

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19 Department of the Interior, Conservation of Wildlife, p. 130.
Other functions of this service include research and
demonstration projects which are conducted in cooperation
with land-grant colleges. Research relating to wildlife
resources of the national parks is conducted by ten labora-
tories. Since disease is a serious problem among wildlife
creatures, there is a section of Disease Control which makes
studies to minimize the losses of wildlife.

The Fish and Wildlife Service is seeking to conserve
the supply of food and game fishes and in doing so operates
110 hatcheries which produce more than 8,000,000,000 fish
and fish eggs annually to replenish the streams.20 It
rescues millions of fish stranded by receding flood waters.
It cooperates with states and other agencies in fish culture
problems. Studies are made on how to protect fish in con-
nection with irrigation, water power, and flood control
projects by maintaining screens, fish ways, or fish ladders.

The melodious songs and the incessant activities of
birds, the drama of the lives of wild things, the companion-
ship that animals somehow give to man -- these are among
life's real pleasures. Such associations are a part of man's
attachments to the soil and are eminently worth preserving
for their own sake. Since there are economic as well as
esthetic factors concerned, the deliberate encouragement of

20Department of the Interior, A Guide to Conservation
Law and Practice, p. 11.
many forms of wildlife may be recognized as sound agricultural practice.
CHAPTER V

MINERALS

Since Coronado's search for the Seven Cities of Cibola, the fabulous mineral wealth of what is now the United States has been told in song and story. No less colorful in fact than in fiction was the stirring era of Sutter's Mill and the forty-niners, the Comstock Lode, the Alaskan gold rush, boom towns, the Teapot Dome Scandal -- each in its time and place contributing to the history of the progress of the nation. With such untold riches for the taking, it is no wonder that the inexperienced and expanding nation gloried in the wealth to the extent of endangering and depleting it with a careless and wasteful hand; but it was inevitable that the day should come when the people must be jarred out of their complacent acceptance of the wealth that was theirs. It took drastic conservation measures to do it.

By the conservation of minerals we mean not hoarding, but orderly and efficient use in the interest of national welfare, both in peace and in war, without unnecessary waste either of the physical resources themselves, or of the human elements involved in their extraction. The central
idea of mineral conservation is that the impetuous expansion of pioneer days should give way to orderly and less wasteful development.\textsuperscript{1} The danger does not lie in absolute exhaustion in some indefinite future, but rather in an early increase in cost through unnecessarily early depletion of the rich, accessible deposits.\textsuperscript{2}

The oldest agency for mineral conservation is the Geological Survey, created in 1789. Through field and office work, and through laboratory research by trained engineers, it investigates the natural resources and records all pertinent data about them. The findings of this bureau have resulted in a wise use of our minerals which are important in both peace time and war time pursuits. It is largely on the basis of the recommendations of the Conservation branch of this bureau that the coal and oil of the public domain are released for development under proper conservation regulations.

Through its operation the Geological Survey has served to bring about the production without waste of oil, gas, coal, potash, and other minerals of the public domain, and has supervised the return to the public treasury for the benefit of the Indians of the proper rents and royalties for mineral productions amounting to millions of dollars.


\textsuperscript{2}Barkley, \textit{op. cit.}, p. 1943.
Survey geologists constantly explore and study the earth's crusts, making thousands of analyses of the minerals and rock specimens, in order that America may know the source, form, quantity, and quality of the mineral resources. The Geological Survey protects from improper use the mineral resources on the public domain, on Indian lands, and on naval petroleum reserves. When these lands have been classified as favorable for minerals, the branch acts as an overseer when the mines are opened and oil wells are drilled. In 1907 the mining technology branch of the United States Geological Survey was created.

Andrew Carnegie in 1908 called attention to the need for conservation of coal when he told the Governors' Conference on Conservation that up to that time 7,500,000,000 tons of coal had actually been consumed while about 9,000,000,000 tons had actually been destroyed or wasted. Likewise a statement was made that for every barrel of oil obtained at least ten barrels had been wasted. Action was taken, and in 1908 reports of the National Conservation Commission contained the following recommendations:

It is of utmost importance that a Bureau of Mines be established to reduce the loss of life in mines and the waste of mineral resources and to investigate the methods for prolonging the duration of our mineral resources.  

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3Elliott, op. cit., p. 505.

4Harrison P. Fagan, American Economic Progress, p. 54.
The Bureau of Mines is an outgrowth of the technological and safety studies which were first undertaken by the Geological Survey. The two objectives of this bureau are the conservation of minerals through increased efficiency in their mining operations and use, and the conservation of human lives by safer methods of mine operations. The bureau has been a pioneer in the scientific study of fuels. At fourteen stations scattered in the principal mineral regions, investigations are conducted. These investigations are the basis for better methods of selection, distribution, and use of fuels. The bureau conducts studies to determine the causes of mine accidents and has developed the safer types of explosives and mine lamps now generally in use. One and one-third millions of workers have been trained in first-aid mine rescue work. Hundreds of mine operators who did not have the money to pay for the engineering advice have been taught to operate their mines safely. As a conservation measure, the use of rock dust in coal mines is encouraged, to counteract coal dust and to limit dust explosions. This practice saves the lives of two hundred people annually.\(^5\)

The Bureau of Mines supplies data needed in the defense program. Certain strategic minerals, which ordinarily are imported from other countries, and which are vital in

economic welfare, are receiving special attention. The bureau is studying the occurrence of ores of these minerals to determine their tenor, to estimate mining costs, and to devise efficient methods of extraction and processing, so that in an emergency such knowledge will be available. Although the domestic production of magnesium is the greatest in history, serious shortages have occurred, largely because of the requirements for low-weight structural materials by the aircraft industry. The Bureau of Mines produces virtually all the world's helium at its plant near Amarillo, Texas, which it supplies to the Army and the Navy for lighter-than-air craft and sells to the public for medical and scientific purposes. Greater amounts of helium will be needed for training men in barrage-balloon operations and for airships and varied uses in the fleet. Funds have been appropriated to the Bureau of Mines for the addition of a new production unit which will increase the plant's capacity fifty per cent. A process for producing high-grade manganese metal from low-grade domestic ore has been developed. Touhoul, essential for defense in the manufacturing of explosives, has been made available from petroleum.6

The lack of resources of natural oil has forced

6"German Patents and the United States Defense," The Oil Weekly, CII (June 16, 1941), 10.
European nations to realize the full importance of hydrogenation and to develop a process for treating coal with hydrogen for producing fuels suitable to use in internal combustion engines. The Bureau of Mines has been carrying out research along this line, and the work has now progressed beyond the stage of laboratory studies. Pilot plants have been built where high-grade aviation fuel can be produced from oil by hydrogenation and by the refining processes of hydroforming and catalytic refining.

In 1941 one of the outstanding features of work on health and safety in relation to national defense was the training by the Bureau of Mines of nearly 250 first-aid instructors who are distributed among two thirds of the states of the Union and would be available without loss of time for civilian or military first-aid instructors. Three thousand miners have been trained to use the oxygen breathing apparatus, gas masks, and the methods of recovery after explosions in confined places. More than seventy-five thousand workers have been trained in this work and would form the nucleus of an efficient corps if civilian rescue work should be needed.

In 1906 President Theodore Roosevelt instituted the leasing system when he ordered the withdrawal of valuable coal lands pending classification by the Geological Survey. He withdrew 80,000,000 acres of coal and 4,700,000 acres of
phosphate lands from entry. The purpose of the President was to have Congress to pass laws whereby the resources of the Federal lands would be leased rather than sold. Phosphate lands were withdrawn in 1908; metalliferous minerals were withdrawn in 1912, and potash deposits the following year.

In 1910, under the administration of President William Howard Taft, another law was passed which distinguished between surface and sub-surface rights to the Federal land. It meant that if a cattle man, for instance, took up 640 acres of public ranch land, he had the right to the grass, but he did not own the minerals under the surface.

Prior to the time of Theodore Roosevelt and William Howard Taft, the mineral industry had been built up through private initiative, with little thought for control. The people were shocked when Taft, by executive orders, dated September 2, 1912, December 15, 1912, and April 30, 1915, set aside for the exclusive use of the United States Navy three petroleum reserves, while there still remained large tracts of unappropriated public lands believed to contain oil. It had been an assumed principle that private enterprise required no guidance in developing the natural resources and needed no help from the government. Hence government control of minerals on other than public lands was very slow in emerging.
One of the earliest cases in which national thought was drawn to the waste of oil and gas production was the report of the United States Geological Survey on Conservation of Our Resources, published in 1909. The report established the loss of gas, for instance, at one billion cubic feet per day. In 1913 the American Institute of Mining and Metallurgical Engineers created a petroleum committee to study the efficiency of production management.\(^7\) This report and the World War that followed made people acutely conscious of their dependence upon minerals. In 1914 Congress revived the leasing system by enacting a coal leasing law for Alaska, and in 1917 extended this policy to potash on all public lands of the United States. In 1920 Congress passed a General Leasing Law, whereby the government lands containing coal, phosphate, oil shale, and sodium salts are to be released on royalty basis and not sold. In 1927 this was extended to cover sulphur, gold, silver, and mercury.\(^8\) The general workability of the leasing laws and the advantage in the conservation of life, health, and resources through their operation have been demonstrated.

The Federal government undertook the regulation of

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\(^7\)Louis H. Hacker and Benjamin Henderick, United States Since 1865, p. 63.

\(^8\)Department of the Interior, Energy Resources and National Policy, p. 24.
the bituminous coal industry on an emergency basis during the World War. The Food and Fuel Control Act, passed August 10, 1917, provided for the conservation of prices, production, distribution, and the storage of coal. The emergency regulation was abandoned after the close of the war.

For years bituminous coal mining was the step-child of our economy, but today, thanks to the developments of the last six years, the whole outlook for the industry has changed. This change may be credited in particular to the enactment of the Bituminous Coal Conservation Act of 1937, which was the result of twenty-five years of investigation by Congress. In March, 1933, it was apparent that an articulate plan for the rehabilitation of bituminous coal mines was long overdue.

During the decade 1923-1932 production was reduced forty-five per cent, sales realizations were cut in half, almost five thousand mines were forced out of business, and the enormous profits of the industry in the years immediately following the war were transformed into a net loss of $51,167,000. Significantly enough, a major share of the losses occurred prior to 1930, when virtually all other American industries were being swept forward with a riptide of post-war prosperity. Even in 1929, when the pinnacle of the post-war prosperity was reached, the bituminous coal
industry operated at a net loss of $11,622,000. The lean years that followed the wake of 1929 served merely to accentuate the plight of the industry.9

The cluster of influences responsible for the demoralization of coal mining has been relatively familiar since the middle 'twenties. Indeed, the ills of the industry formed the basis for a ponderous body of literature, and many a vigorous thinker of the new era almost made a fortune by discovering an unexpected symptom or contriving a new nostrum. The focal points of disorder at this time were these: excess mine capacity; competition of other sources of power and heat; advances in fuel efficiency; and technological changes in methods of mining. Conditions in the industry were so thoroughly demoralized that the nation's coal supply was threatened or impaired many times during that period.

The Bituminous Coal Division was established in 1939 to administer the Bituminous Coal Act of 1937. Administration of this law called for joint cooperation between the government and the coal industry. More than 12,000 producers have chosen to participate in the Bituminous Coal Code. Producers who are not members of the code, or members who violate it, are subject to a 19.5 per cent tax on

9R. O. Rogers, "Saving the Coal Industry," Survey Graphic, XXVII (June 1, 1937), 326.
the sale of their coal. Code members of each of the twenty-two districts have been elected members of their respective bituminous coal producers' board, and an additional member of each board has been designated by the Governor as the representative of the mine employees. These boards propose minimum prices and marketing regulations to the divisions. After public hearings, the division establishes minimum prices and marketing regulations.¹⁰

The marketing stabilization machinery erected under the act involved three and one-half years of intensive cooperative effort by the government, the coal industry, and the consumers' representatives. On October 1, 1940, the minimum prices and marketing regulations established by the Bituminous Coal Division under the Coal Act became effective. Minimum prices were set at levels which gave the coal producing industry an income which would be equal, as nearly as may be, to the cost of production, and thus maintain a "cost-floor" under the minimum prices and marketing rules in effect in the sale of coal at the mines. The establishment of minimum prices and of rules for marketing provides the industry with a bulwark against ruthless price cutting and unfair trade practices which had previously kept it in a state of upheaval for nearly twenty years.

The importance of assuring the continuance of the stable

¹⁰Hughes, op. cit., p. 16.
conditions in the coal industry which have been brought 
about under the act is paramount, particularly in the time 
of our national emergency. This act, originally passed to 
expire April 26, 1941, was extended by Congress to April 26, 
1943. The value of the Bituminous Coal Act as a national-
defense measure is obvious. Under this law the forces of 
government and industry have been welded into a harmonious 
and effective working organization.

The prevention of gas waste became one of the chief 
concerns of the Coolidge administration. In December, 
1925, President Coolidge appointed an oil conservation 
board consisting of four members of his Cabinet. Its pur-
pose was to assure naval and military oil and gasoline sup-
ply, as well as to report the entire question of oil con-
servation. Experts were employed, hearings were held, 
and the waste of gas was pointed out in a scientific man-
ner. This board made recommendations for reducing waste 
in private oil production, including the flush of new pools.

The major legal and administrative difficulties of ef-
fective oil conservation arise from the rule of capture. 
Under this rule the landowner owns the gas and oil under 
his property. In so obtaining oil it makes no difference 
if the oil and gas come from pools under the farms or 
property of adjacent owners, for there is no practicable 
means of identifying the oil. Some time ago the conditions
of capture were thus aptly described:

Every landowner or lessee may locate his wells wherever he pleases regardless of the interests of others. He may distribute them over the whole farm or locate them in only one part of it. What can the neighbor do? Nothing; only go and do likewise. He must protect his own oil and gas. The geological fact is the oil pool, not the legal fact of surface ownership.\textsuperscript{11}

Herbert Hoover, by one bold stroke in the first eight days of his administration, announced this policy:

There will be no lease or disposal of Government oil land no matter what emergency may lie ahead, or Government holdings or Government controls, except those which may be mandatory by Congress. In other words there will be complete ownership of Government oil land in this administration.\textsuperscript{12}

On March 25, 1929, Hoover amplified his statement by saying: "There are no half-way measures in conservation of oil. The Government must cease to alienate lands if we are to have conservation of oil."\textsuperscript{13} Again, on April 2, 1929, Herbert Hoover in conference with Attorney General Mitchell and Secretary of the Interior Wilbur stated that action was needed to stop waste of natural resources, and to give stability to the oil industry by regulating the periodic over-production from newly discovered pools. A conference was called to meet at Colorado Springs, June 10, 1929. Secretary of the Interior Wilbur laid before the conference a plan for calling a compact of states by which each state


\textsuperscript{12}\textit{Ibid.}, p. 236.

\textsuperscript{13}\textit{Ibid.}, p. 238.
agreed to set up regulations to restrict and to repress excessive drilling and wasteful methods in collaboration with each other. His plan for stabilizing the industry was rejected in favor of Federal control. When the delegates came to no agreement, a further study of the problem was recommended, and the delegates adjourned.

Proration means the method of dividing or allocating the market demand among the various fields and wells within a pool so that each will be allowed to obtain its fair share of the market demand.\textsuperscript{14} Usually proration is based upon market demand, but in one state (Texas) the allowable rate of production is based on the engineering fact of maintaining a uniform reservoir pressure by equalizing the withdrawals of oil, gas, and water in relation to the encroachment of the edge water. Studies by the engineering staff of the Texas Railroad Commission for the East Texas Field indicate that a production rate of about 450,000 barrels daily from the field will maintain an approximately constant reservoir pressure, prolong the flowing of the field, and result in an increased flow of oil. Under this scheme it has been estimated that the recovery was increased at least thirty per cent. The solution is to have wide spacing of wells. This will allow the production of all oil needed

\textsuperscript{14} Ernest O. Thompson, An Administrator's View on Prooration, p. 20.
without so many wells. This means that oil may be produced at less cost and greater return on the investment. For example, gasoline was selling in 1920 in fifty leading cities at twenty-nine cents a gallon. There were no taxes. Today gasoline is selling in those same American cities at fourteen cents a gallon not including taxes; therefore, the consumer is getting a far superior product at one-half the cost of gas in 1920. In addition to the state of its origin, Pennsylvania, proration has been regularly administered in Texas, New Mexico, Kansas, and Louisiana. 15

In 1935 an Interstate Compact Commission was created. The essential purpose of the compact under which such a commission functions is to conserve the oil and gas by prevention of physical waste. The compact was tentatively agreed to by nine oil-producing states at a meeting in Dallas on February 13, 1935, and the compact as adopted is dated February 16, 1935. 16 The Interstate Compact to Conserve Oil and Gas as adopted made the following provisions:

Each state bound hereby agrees that within a reasonable time it will enact laws, or if laws have been enacted, then it agrees to continue the same in force, to accomplish within reasonable limits the prevention of:

15 Clifford J. Hynning, State Conservation of Resources, p. 43.

16 H. Herbert Hughes, Mineral Year Book, 1935, p. 75.
(1) The operation of any oil well with an efficient gas-oil ratio.
(2) The drowning with water of any stratum capable of producing oil and gas.
(3) The avoidable escape into the open air or the wasteful burning of gas from a natural gas well.17

The purpose of the above compact was to conserve oil and gas and to prevent avoidable waste thereof within reasonable limitations.

The act of February 22, 1935, generally known as the Connally Act, is directly traceable to the meeting of the Governors of the principal oil-producing states with the Secretary of the Interior in Washington on March 27, 1933. The Connally Act is designed to assist the states in their conservation efforts by prohibiting the shipment of oil in interstate and foreign commerce produced in violation of state laws. By Presidential order of February 28, 1935, the Secretary of the Interior was designated as the administrator of the Connally Law. The Connally Law, which was to have expired by limitation on June 16, 1937, has been extended over temporary periods to June 30, 1942.18

The operation of the Connally Law has demonstrated a method by which the state and Federal governments may work together to prevent the waste of petroleum resources and to increase the ultimate recovery of oil.

17 Ibid., p. 350.
In 1936 the Petroleum Conservation Division was established to cooperate with the oil and gas states to prevent the waste of oil and gas production. With petroleum and petroleum products becoming an ever-increasing factor in national defense, operation of the Petroleum Conservation Division assumed greater importance during 1941.

While the Connally Act is applicable to any state having a conservation law regulating the production of petroleum, the tender system has heretofore been used only in the East Texas oil field. However, by order approved by the President on May 26, 1941, the Secretary of the Interior extended the area from which monthly reports of the producers, refiners, and transporters of petroleum will be required, to include portions of New Mexico, Texas, and Louisiana. Areas other than those designated in the Secretary's order will be under constant observation by examiners of Federal Tender Board Number One and the Petroleum Conservation Division, and no crude petroleum or petroleum products will be permitted legal shipment from coastal points of Texas and Louisiana without reporting to the Petroleum Conservation Division the field of origin and the state orders under which the oil moves.\(^\text{19}\)

In 1938 a Mineral Advisory Committee to the Army and Navy Munitions Board was appointed with Dr. C. K. Leith

as chairman. Seventeen civilian commodity sub-committees were organized, and each prepared confidential reports upon the national-defense aspect of their minerals.

By an act of Congress approved July 2, 1940, the President was authorized to prohibit or curtail exports as needed in the interest of national defense. The first proclamation under the law prohibited the exportation of all strategic and critical minerals except under licenses. Subsequent proclamations extended control to other commodities, so that by the latter part of June, 1941, exports of virtually all of the important minerals except coal and some non-metallics required government license. The Office of Coordination of Commercial and Cultural Relations between the American Republics, for example, has been instrumental in promoting geological studies, by the staff of the Geological Survey, of the strategic mineral deposits of Latin America. To assist in the procurement of strategic minerals from Latin America, four mining engineers of the Bureau of Mines have been assigned to the United States embassies in Argentina, Peru, Brazil, and Chile.

On January 30, 1941, a Priorities Committee for Non-ferrous Minerals was established in the Priorities Division of the Office of Production Management.

Mineral conservation has two very close friends. President Franklin D. Roosevelt and Coordinator Harold L. Jokes
have been at the forefront of the conservation movement, and to their watchfulness and unfailing energy much of the credit for the present advancement is due.
CHAPTER VI

WATER POWER

In 1900 the movement for irrigation had ceased to be a local one. The major political parties in drawing up their platforms took cognizance of it. When the Republicans met in Philadelphia in June, 1900, they inserted a carefully worded plank that would gain the favor of the West. It did not say that the Federal government should undertake the reclaiming of the West; it merely stated, in further pursuance of the constant policy of the Republican party to provide free homes on the public domain, that it recommended adequate national legislation to reclaim the arid lands of the United States, reserving control of the distribution of water for irrigation to the representative states and territories. Likewise the Democratic party in July, 1908, favored an intelligent system of improving the arid lands of the West, storing the waters for the purpose of irrigation and holding of such land for actual settlers. The Silver Republicans were more definite in phrasing their plank, which said:

We believe that the National Government should lend encouragement and assistance toward the reclamation of the arid lands of the United States; and to
that end, we favor a comprehensive survey thereof, and an immediate ascertainment of the water supply available for such reclamation. . . .

Theodore Roosevelt in his first message to Congress promoted the conservation movement when he said:

It is as right for the national government to make the streams and rivers of the arid region useful by engineering works for the storage of waters as to make useful the rivers and harbors of the humid region by engineering works of another character.1

In a short time the Reclamation Law of June 3, 1902, received a vote of 146 to fifty-five in the House of Representatives and little serious opposition in the Senate. This act set aside the proceeds of the sale of public lands for the purpose of reclaiming the arid lands of the West. Money expended on irrigation projects was to be repaid in due course of time without interest, a concession which reflected the national interest in the program. The Secretary of the Interior was to have charge of reclamation and was authorized to investigate and construct feasible irrigation projects. Within four years he had approved twenty-six irrigation projects, located in fourteen states: Arizona, Colorado, Kansas, Montana, Nebraska, Washington, Utah, Wyoming, New Mexico, North Dakota, Oregon, California, South Dakota, and Idaho.

1John T. Gano, "The Origin of a National Reclamation Policy," Mississippi Valley Historical Review, XVIII (June, 1931), 42.

2Elliot, op. cit., p. 468.
The legislation assured the continued interest of the Federal government and stimulated the investment of further private capital in reclamation projects, so that in the four years from 1905 to 1909 nearly a quarter of a billion dollars more went into western projects, only $40,000,000 of that sum being spent by the Federal government.

On March 14, 1907, Theodore Roosevelt appointed an Inland Water Commission. This commission included a geologist, a forester, a statistician, an engineer, and an irrigation chief. In its report to the President the commission emphasized the interlocking character of the problem of natural resources, and pointed out how the control of water would conserve coal, iron, and the soil, and at the same time preserve the forests.3

One of the first projects constructed by the Bureau of Reclamation was the Rio Grande Federal Reclamation Project, located along the Rio Grande, extending northward from the city of El Paso to a distance of one hundred miles in New Mexico, and south about forty miles in western Texas, with an irrigable area of approximately 175,000 acres. Surveys and investigations of the feasibility of the project were begun in 1903. It was authorized in 1905, work was started in 1906, and water was delivered in 1908. The irrigable land on the project, comprising 175,000 acres, is

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3Van Hise and Havemeyer, op. cit., p. 6.
one of the most fertile spots in the world. Farmers throughout the project are very progressive. The soil is peculiarly suited to the production of cotton. Fabens, Texas, in this district, claims to be the highest producer of cotton per acre in the world. Alfalfa, cantaloupes, and sugar-beets are produced for market, and there have been some recent attempts to produce spinach and onion seed for market. This project has been of inestimable value to the people of the surrounding country. In addition to the irrigation feature of the undertaking, the project has played an important part in controlling the floods that used to ravage the valley. Contrary to its placid appearance, the Rio Grande has done a great deal of damage.

The Salt River Project is located in Maricopa County, in south-central Arizona, and comprises 242,000 acres of arable lands on both sides of the Salt River. It was authorized by the Secretary of the Interior on March 12, 1903. The water supply came from the controlled flow of the Salt River and Verde River, supplemented by 170 plants utilizing underground water.

Progress on the reclamation program was praised by President Taft in a speech delivered at Spokane, Washington, September 29, 1909, when he said:

... There are more than thirty projects which have been entered under the Bureau of Reclamation, and I believe all of them are to be commended for their
excellent adaptation to the purpose for which they have been created. . . . 4

Much preliminary work was necessary to construct the Roosevelt Dam, an arch-gravity type dam located on the Salt River, sixty-five miles from Mesa and thirty-five miles from Globe. A freight road, one hundred twelve miles in length, built at a cost of $550,000 by the Apache Indians, was completed in December, 1904. A portable sawmill for sawing lumber and a mill for manufacturing cement made an additional expense of $55,000. The dam was dedicated March 11, 1911, at which time President Theodore Roosevelt was present, the dam having been named in his honor. This project is an example of how Federal reclamation has supplemented and aided private irrigation enterprises. It has done this because its reserves of resources and continued operation enable it to undertake work too costly for private capital.

In nearly every large valley of the arid region, the reclamation policy has acted as a life-saver for communities which had begun projects under private enterprise. The settlers in Salt River Valley, Arizona, securing water from a half dozen privately built canals, found themselves unable to obtain means to complete their work or build the reservoir needed to regulate the river's discharge. By means of the Roosevelt Reservoir this valley was made one of the richest

4Carl Hayden, National Irrigation Policy, Its Development and Significance, p. 11.
agricultural areas in the West.  

An act of June 25, 1910, authorized the Treasury to advance to the Reclamation Fund $20,000,000 for construction purposes, to be repaid by one half of the annual receipts of the Reclamation Fund. The repayment of the other half was deferred from time to time by acts of Congress, until 1929, when it was all repaid.  

The Warren Act of February 21, 1911, authorized the sale from a Federal project of surplus water for use on lands outside the project on terms that should be no more favorable than those obtained by users on the project. Further, it authorized cooperation among all water users, whether upon or outside the project, in developing irrigation projects.  

The Reclamation Extension Act, August 13, 1914, extended the period of repayment for construction charges from ten to twenty years, and provided that expenditures should no longer be made directly from the Reclamation Fund, but should be made only out of the appropriations from such fund made annually by Congress. This piece of legislation speeded construction projects.  

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5Department of the Interior, General Information Concerning the Salt River Project, p. 1.
6Department of the Interior, Outline of General Authority and Policies of Bureau of Reclamation, p. 2.
7Ibid., p. 3.  
8Ibid.
The Elephant Butte Dam, constructed across the Rio Grande about 125 miles above El Paso, was completed in 1916. The dam, a straight gravity concrete type of structure, has a maximum height of 301 feet and a total length of 1,674 feet. A reservoir having an original capacity of 2,638,000 acre-feet was created, which was at that time the largest artificial irrigation reservoir in the world. Its purpose is to store and regulate the very erratic flow of the Rio Grande. The Rio Grande has a mean annual run-off of about 1,000,000 acre-feet, but with a recorded maximum of 2,422,000 acre-feet and a minimum of 210,000 acre-feet. The annual irrigation requirement is approximately 700,000 acre-feet released from the reservoir. For periods up to fifteen consecutive years no water is available for release beyond the irrigation requirements. In years of high flood run-off, storage capacity will be vacated in advance of the flood, when necessary, to control the discharge to downstream channel capacity. Water released from the reservoir for irrigation is distributed to lands on the project by means of five diversion dams and over six hundred miles of canals and laterals. The drainage system comprises about 450 miles of deep drainage ditches.\(^9\)

The Federal Water Power Act of February 25, 1920, authorized the sale of water from a project for miscellaneous

purposes, provided such sales should not be detrimental to the primary requirements of the project.¹⁰

Before any project may be constructed, the Secretary of the Interior is required to make a declaration of its feasibility, according to an act of December 5, 1924, which provided that

No new projects or new divisions of a project shall be approved for construction or estimates submitted therefor by the Secretary until information in detail shall be secured by him concerning the water supply, the engineering features, the cost of construction, land prices, and the probable cost of development, and he shall have made a finding in writing that it is feasible, that it is adaptable for actual settlement and farm homes, and that it will probably return the cost thereof to the United States.¹¹

Investigations which led to the Provo River Project had their origin in 1922. The plan provides for the storage and delivery of supplemental water supply of sufficient quantity to supply 100,000 acres of farm land in the Utah and Salt Lake valleys. This project does not bring new lands into cultivation, but it aids only those lands which have been cultivated in the past.

The construction by the Bureau of Reclamation of the Vale Project in eastern Oregon was authorized by an act of Congress on December 5, 1924. The Vale Project is located in Malheur County, on the eastern Oregon–Idaho state line,

¹⁰George Smith, "Safeguarding the Nation's Natural Wealth," *Current History*, XXII (August, 1925), 746.

¹¹E. Mead, "Making the American Desert Bloom," *Current History*, XXXI (October, 1929), 134.
and water for the project lands is diverted from the Malheur River by a local diversion dam. The main canal is designed to carry one cubic foot of water per second for each fifty acres of land irrigated.  

Water was first available in 1924 on the Riverton Project, in Fremont County, Wyoming, on the ceded portion of the Wind River Indian Reservation. All the water for the project is diverted from Wind River by a concrete diversion dam.

Arthur Powell Davis, when a boy of eight, fell in love with the Colorado River. He resolved to be an engineer in order that he might harness and control this mighty current and make it irrigate the desert through which it passed. The older he grew the more he felt the challenge of this wild giant's behavior in allowing its banks to become a desert. What a splendid contribution it would be if he could dam up the runaway river, control the floods of its lower delta, store the water, and use it to turn the deserts into gardens of flowers. In 1914 Arthur Davis became director of the United States Reclamation Service and promptly reported on a definite plan for the construction of a dam on the Colorado River. Thirteen years were spent surveying for a site. In 1928, when Arthur Davis was sixty-seven years old, he saw the passage of the Swing-Johnson bill

through Congress. Being known as the Boulder Canyon Project Act, the measure authorized the Boulder Canyon Project and the All-American Canal. Before the project could be begun, it was required that the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming should ratify the Colorado River Compact, or at least that it should be ratified by California and five of the other states. By 1930 the act had been ratified by the required six of the seven states, and construction was begun by the Bureau of Reclamation in 1931. Boulder Dam, located on the Colorado River, where it forms the Arizona-Nevada boundary, is by far the largest dam in the world. Never in the history of the world have there been such foundations, for never before had there been such a weight placed upon the earth by mankind -- seven million tons of concrete. To support this burden and hold back the millions of tons of water behind it, the dam had to be made 660 feet thick at the base, and from the foundation rock it towers 725 feet high.

The achievements of Boulder Dam run the scale in the field of water conservation from flood control to provision for a valuable waterfowl refuge. In regulating the treacherous Colorado River, Boulder Dam has been instrumental in

13Statutes at Large, p. 1058.
raising the standards of living in the southwestern territory which it serves; it has eliminated floods in the Imperial Valley; it provides a reliable water supply; it furnishes a large supply of low-cost power for industry. The cost of constructing the dam, $70,600,000, was paid by the Federal government, but over a period of years the United States Treasury will be reimbursed from the income produced by the project.\footnote{15}

The All-American Canal, largest irrigation ditch in the Western Hemisphere, taps the Colorado River 330 miles downstream from Boulder Dam. This canal, constructed under the same act which authorized Boulder Dam, is eighty miles in length. It provides a new main irrigation supply for the Imperial Valley in southern California where 600,000 acres of highly developed lands can be irrigated.\footnote{16} Water was first delivered to the lands of the Imperial Valley through the All-American Canal on October 12, 1940.

Evacuation for the Gibson Dam on the North Fork of Sun River, about eighty miles west of Great Falls, Montana, was begun in December, 1927, and the dam was completed in July, 1929, at a cost of $2,300,000.

President Herbert Hoover in a letter to the Western Governors in Conference at Salt Lake City, June 30-July 2,

\footnote{15}Department of the Interior,\textit{ Bureau of Reclamation}, p. 1.

\footnote{16}Department of the Interior,\textit{ General Information Concerning the All-American Canal}, p. 1.
1930, took cognizance of the national significance of reclamation when he said:

The undertaking, reclamation, has been of great benefit to this region [the West] and has been the cause of adding much wealth to the Nation. Only one per cent of the farm commodities raised in the United States are raised in Federal Reclamation Projects and ninety per cent of the quality so produced are locally consumed. The products themselves furnish extensive markets for manufactured goods as well as farm products not raised under irrigation, and thus serve to afford material benefits rather than detriment, to other sections. Crops raised under irrigation are generally supplemental to, rather than competitive with, the products of other farms.17

Likewise, Franklin D. Roosevelt thinks reclamation as a Federal policy has proved its worth and deserves a very definite place in our economic existence. Spread over one third of the United States and creating taxable values and purchasing power affecting municipal, state, and Federal government and private industry, these projects, he feels, should provoke national pride.

During his administration twenty-three storage dams have been built with a capacity of 37,304,494 cubic feet or 11,000,000,000,000 gallons of water. Completion of the Bartlett Dam, the highest multiple-arch dam in the world, fifty-four miles northeast of Phoenix, was achieved on April 1, 1939. The maximum height of this dam is 286.5 feet. Additional storage for the Indian lands and Salt

17 Hayden, op. cit., p.13.
River Project lands is provided by a reservoir of 200,000 acre-feet capacity. Construction was started in June, 1936, on the Caballo Dam, located on the Rio Grande, about twenty-five miles downstream from Elephant Butte Dam. An agreement entered into on October 9, 1935, between the Secretary of the Interior and the Secretary of State provided that the title and control of the Caballo Dam should be retained in perpetuity by the government. It is provided, too, that there shall always be reserved in the reservoir at least 100,000 acre-feet storage capacity for flood-control purposes.\textsuperscript{18}

During this period the government started the Central Valley Project in California. An adventurous band of Spanish soldiers chasing Indians from the mission of Monterey were the first white men to look into Central Valley. They found it a desolate desert. One hundred years later the first interior settlers, utilizing the unregulated spring flow of the rivers, made the valley a vast area of cattle ranches. Today, under intensified agricultural practices, it has become an empire of diversified agriculture, dependent upon an adequate supply of the valley's greatest natural resource, water. The water resources are out of balance with the irrigable lands. Under existing conditions a million acres faced an acute irrigation crisis. Almost 50,000 acres

\textsuperscript{18}Department of the Interior, General Information on the Caballo Dam, p. 1.
of highly productive land had been abandoned because wells went dry. Some 200,000 acres were in the process of reversion to desert. The restoration of this valley involves control and utilization of two major rivers -- Sacramento and San Joaquin. These rivers, fed by the snow of the Sierra Nevada Range, will be harnessed by two mighty dams, the Shasta and the Friant, both under construction, and will be diverted by a 350-mile system of canals -- the Contra Costa, the Madera, and the Friant-Kern. These canals serve areas of water deficiency. By means of the Shasta Dam on the north and the Friant Dam on the south regulation of the Sacramento and the San Joaquin Rivers will provide water to supplement the irrigation supply of a large area of highly improved orchard and farm lands. On June 1, 1941, the Shasta Dam was fifty-three per cent complete, and the Friant Dam was seventy-two per cent complete.

In recent years private enterprise that has undertaken the construction of dams has had to resort to Federal aid. This was the case when private enterprise undertook to construct two dams on the Colorado River. The Alexander Dam near Marble Falls, and the Hamilton Dam near Burnet were discontinued because of financial difficulties. On November 13, 1934, the Legislature of the State of Texas organized the Colorado River Authority for the purpose of completing

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18Department of the Interior, General Information Concerning the Central Valley Project, p. 2.
these abandoned dams. The authority applied to the Federal government and secured funds to complete the Hamilton Dam and also to construct other dams along the Colorado River for flood control, power, and irrigation purposes. As a result of this action the Buchanan Dam, the Marshall Ford Dam, and other projects are well under way.

In September, 1933, an allotment of $4,000,000 was made to the Bureau of Reclamation under the Industrial Recovery Act of June 16, 1933, "for the Upper Snake River to be used for the construction of storage reservoirs on the tributaries of the Upper Snake River." The first reservoir constructed was located on Henry's River, a tributary of Snake River, with a capacity of 127,265 acre-feet. This storage furnishes a better irrigation supply in late summer to an area which had suffered severe irrigation shortage in 1931 and 1934. A growing demand has arisen for storage waters arising mainly from changing crops which require more water and longer summers.

The Strawberry Valley Project is located in the north-central part of Utah, and water for irrigation is obtained from the Strawberry and Spanish Fork Rivers. The flood flow is stored in Strawberry Reservoir, and the irrigation system serves a dual purpose in furnishing a varying supply for about 20,000 acres as well as a supplemental supply for about 30,000 acres. Sugar-beets, cereals, and hay constitute the staple crops of the project.
The Shoshone Project is situated in the northwestern part of Wyoming, in what is known as the "Big Horn Basin." The Shoshone Reservoir is formed by a concrete dam 328 feet high and holds 456,000 acre-feet of water, which is used to irrigate the leading crops consisting of beans, alfalfa, sugar-beets, potatoes, and grain.

Water was first delivered to the Boise Project, located in southwestern Idaho, in 1929. Arrowrock Reservoir, which has a capacity of 286,500 acre-feet and a complete irrigation system delivering water to the individual farms, supplies water to all parts of the project. The Payette division of the Boise irrigation project, now under construction, adds 47,000 acres to the original project.

The Owyhee Project lies along the west bank of the Snake River in Oregon and Idaho and joins the irrigated lands of the Boise, Payette, and Weiser valleys, with a total area of nearly 700,000 acres.

An area of 425,000 acres constitutes the North Platte Project located in the valley of the North Platte River in western Nebraska and eastern Wyoming. Water for irrigation is obtained by the storage of flood waters of the North Platte River in Pathfinder and Guernsey reservoirs.

Grand Coulee Dam, near completion on the Columbia River, near Almira, Washington, is four thousand three hundred feet long and requires 10,500,000 cubic yards of concrete, making
it the largest concrete structure in the world. The purpose of this project is irrigation of 1,200,000 acres of land in the Big Bend country, generation of hydroelectric power for irrigation pumping and industrial and urban consumption, river regulation, and improvement of navigation. A reservoir 151 miles in length extending to the Canadian border will have 9,800,000 acre-feet.

No activity of the government has brought greater private and public benefits to the nation than have come from money spent on government reservoirs. Reclamation is creating a potential wealth that is revolving year after year. Federal reclamation has taken worthless deserts, peopled only by jack rabbits and prairie dogs, and transformed them into an empire with an assessed valuation of nearly one billion dollars. The valuation of the crops produced each year on these projects is nearly equal to the construction cost of the completed projects. No other investment of the Federal government has brought the nation a larger, more solid, and economical return. No other investment of a like amount has done as much to build homes, to strengthen the country, to create taxable property, and to create and maintain an outlet for manufactured goods.20

The map on the following page shows the location of the principal Federal irrigation projects.

20F. D. Helm, "Reclamation as a Federal Investment," Reclamation Era, XXV (March, 1925), 66.
CHAPTER VII

CONCLUSION

Unless a nation has natural resources, it may become physically bankrupt. The pioneers found the territory which is now the United States generously supplied with timber, oil, rich soil, gas deposits, and water; therefore there was no incentive to save. As a result, our record is a record of waste. In the past, to produce one barrel of oil, four barrels were wasted; for every eleven trees cut down for lumber, an equivalent of seven trees was wasted, and so on. For generations people of the United States were largely complacent in the face of this exploitation and waste.

The first notable expression of a conservation policy occurred in the setting aside, in 1878, of nearly four thousand acres of public land in Wyoming to form the Yellowstone National Park. This was the beginning of the national park system -- the forerunner of the National Park Service, born in 1916, to administer one hundred fifty-seven Federal areas.

Twenty years later farsighted men became alarmed over the disappearance of our forests; consequently the government stopped the giving away of timber lands that
belonged to the American people. From these timber reserves the national forest system developed.

During the first decade of the twentieth century, it became apparent that the wildlife of America could not withstand any longer the bombardment of hunters. Thousands of these birds were migratory and could not be protected by state action. Today, as a result of conservation measures, no migratory birds may be killed in the United States except those specified by the Secretary of the Interior with the approval of the President.

Thus, in the first half-century of the conservation movement, three lines of development appear: first, protection of remarkable scenic areas by the establishment of national parks; second, the setting up of a national forest system; and third, government protection of wildlife.

In the past twenty years there has been a broadening of the conservation field. A partial awakening to the reckless waste of our petroleum and coal has led to conservation measures for these resources. The Bituminous Coal Division, with conservation in mind, now has established minimum "at the mine" prices for bituminous coal, which have become effective along with marketing rules and regulations designed to stabilize the market. This was a big step toward the conservation of coal reserves. The production and sale of "hot oil" in East Texas has been virtually
stopped as a result of cooperation between the Department of the Interior and the State of Texas. People, including those in the oil industry, have at last realized that petroleum is an irreplaceable resource and should be conserved at all costs.

The nation has at last awakened to the realization that the greatest national possession of all, the land itself, is being destroyed. The government has undertaken soil conservation and the protection of watersheds in order to stop the loss and injury that threaten to turn millions of acres into a desert. In summing up the results of soil conservation to date, one is warranted in making certain very definite assertions. First, erosion has already been controlled — for all practical purposes — on farms comprising about twenty million acres in private ownership. Second, a partial solution has been found for every type of soil erosion that occurs on American agricultural land. Third, the practices used to control soil erosion and conserve rainfall frequently produce important and far-reaching social and economic benefits over and above physical stability of the land. Moreover, flood heights have been markedly reduced along small streams rising within areas where soil conservation work has been extensively carried on. Yet, despite all this encouraging process, the country as a whole is not moving fast enough in the direction of
conservation and better use of the land.

Believing that an abundant wildlife is an endowment that makes a nation worth the most zealous defense, and realizing that such resources are of long-time importance, the government has added millions of acres to the national system of wildlife sanctuaries. The technique of wildlife management has been advanced; research has been carried forward; important legislation has been enacted; and a definite policy for the conservation of this resource is now firmly established. The system of waterfowl refuges is now half-way to completion. It is essential that this work be carried continuously forward until sufficient sanctuary areas to meet the minimum requirements of these birds have been established on the breeding grounds, flyways, and wintering grounds. An additional 3,500,000 acres are needed in order to accomplish these results. The most pressing need in the national movement to restore the nation's wildlife resources is an effective means of reaching the owners and users of the land to advise them of inexpensive practices which will restore environments conducive to increased wildlife population. Practices designed to encourage wildlife invariably conserve soil and water resources.

Reclamation belongs to the times and is timeless. It is as ancient as the skill of man. Reclamation reservoirs impound water for the irrigation of new lands, provide
homes for destitute migrants sweeping westward, and anchor farm families threatened with desolation. The reclamation projects around these reservoirs, made up principally of family-sized farms, the backbone of the nation's stability, contribute to the purchasing power of the West and the stabilization of the livestock industry. The cumulative value of land watered by reclamation exceeds $275,000,000,000 -- an amount twice the cost of the current reclamation projects. More than 50,000 family-sized homes have been carved from the desert, and more than 25,000 farm homes have been saved by supplemental water development. Hundreds of schools and churches reflect the social influences of the transformation of desert wastes into productive, self-sustaining communities.

Conservation will make for a greater enhancement of our country in the future than would a policy of continued exploitation. It will substitute fertile lands for the areas of the dust bowl which are the result of improvident farming. We must inculcate as a fundamental tenet of Americanization the belief that the proper exercise of our form of Federal government carries with it an obligation to use nature's gifts prudently so that all people may benefit -- not only those of today but also those of tomorrow. Each man is a sentinel over his rightful heritage. Today is the time to conserve conservation.
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