

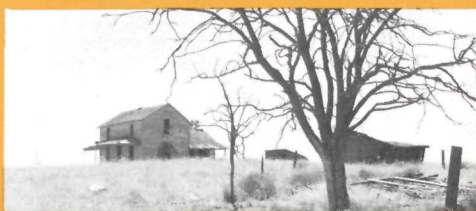
# Columbia Basin Project

Water Resource Project  
Washington

U.S. Department of the Interior  
Bureau of Reclamation



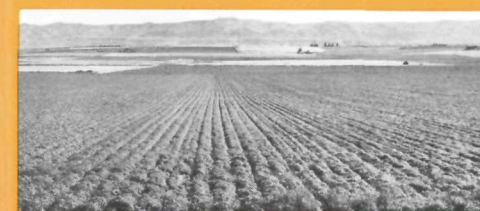
From its glacier-lake source in British Columbia, the Columbia River travels more than 1,200 miles to the Pacific Ocean on the Washington-Oregon coast. The river drains one-quarter of a million square miles - an area nearly as large as the State of Texas. During the last three-quarters of a century, the Columbia has been developed into a major source of



Abandoned farm in Columbia Basin

power for the Pacific Northwest; its waters are stored and diverted to irrigate thousands upon thousands of fertile acres; and it provides domestic and industrial water supplies for numerous towns and cities.

There are many developments - dams and irrigation projects - on and along the Columbia

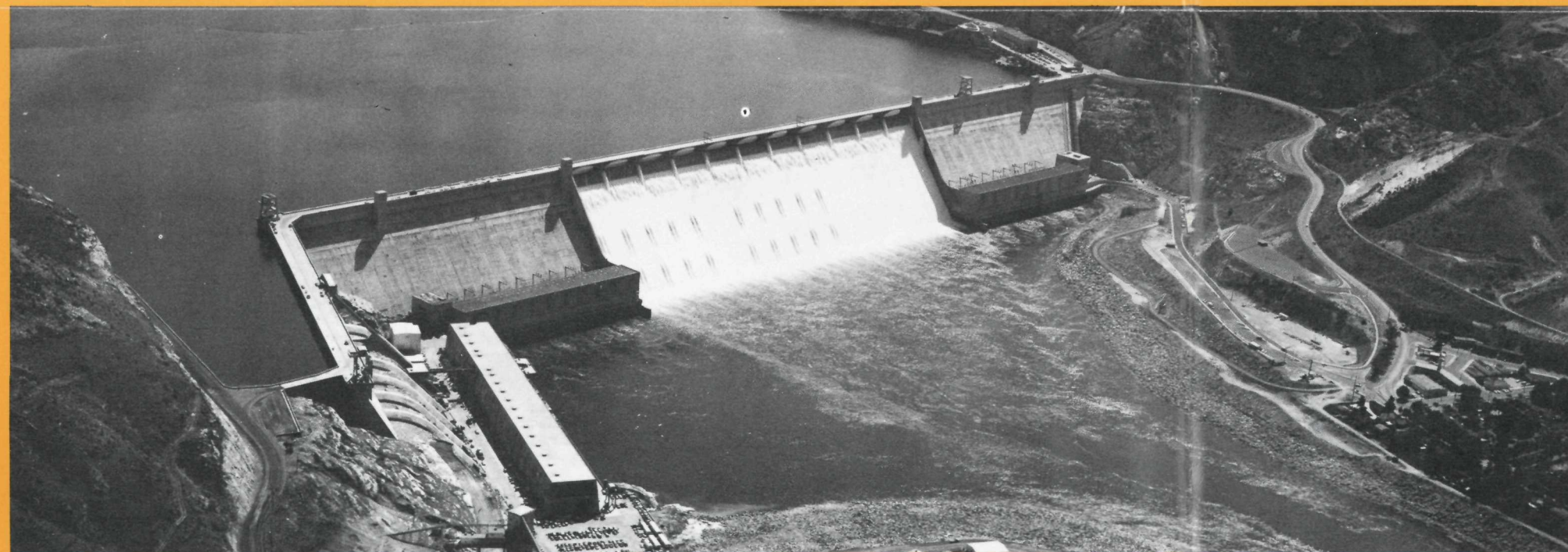


Irrigated farmlands, Columbia Basin

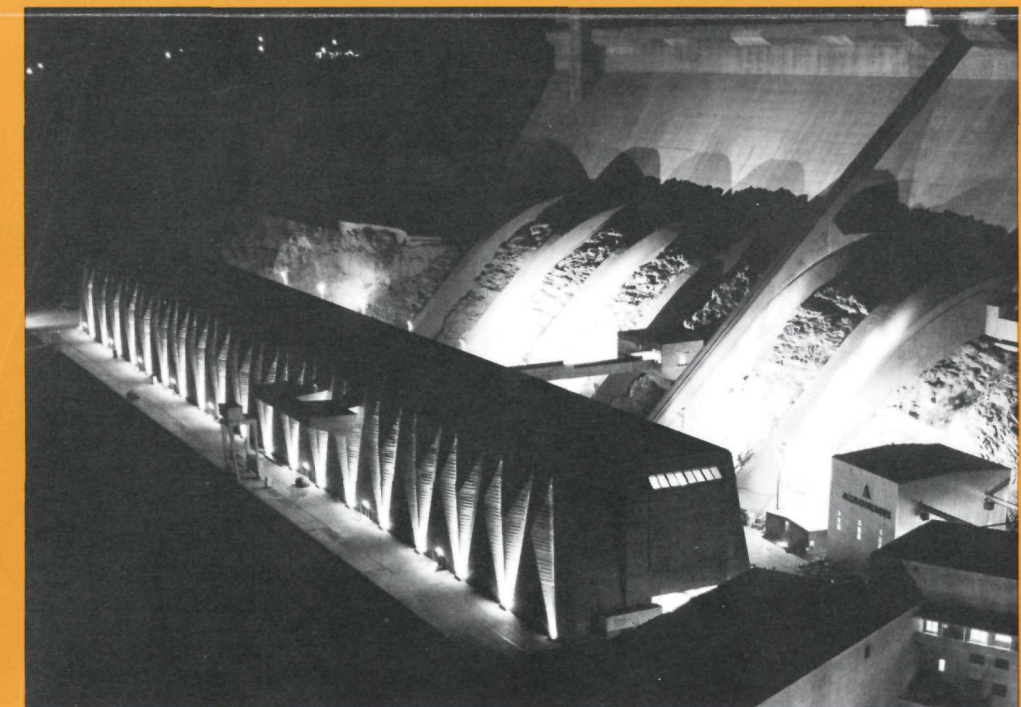


Lake Roosevelt

River. One of the largest is the Columbia Basin Project. Designed and being constructed by the Bureau of Reclamation, this project will ultimately irrigate more than 1 million acres in east-central Washington State. The key feature of the project, Grand Coulee Dam, is also the major component of the hydroelectric power system on the Columbia River.



Grand Coulee Dam



Third Powerplant

## How It Started

In the late 1800's and early 1900's, three railroads were completed across the Columbia Basin. These transportation systems, which provided an efficient means to deliver farm products to markets, prompted a burst of settlement and agricultural development in the basin. Many towns, founded on agricultural economies, appeared along the railroads.

Dryland farming efforts proved prosperous in those years of above average precipitation and precarious when the rainfall matched or fell below the 6-10 inch average for the area. Though the growing season is ample in the basin - about 165 days annually - and the soil well-suited for crops, the lack of water often resulted in widespread crop failure. Drought

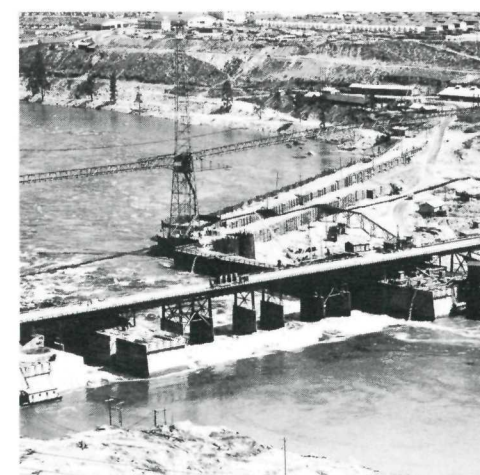
forced some settlers to abandon their farms, others to attempt to develop water supplies for irrigation. But irrigation plans pursued by private groups and organizations during early settlement of the basin often proved too costly or too technically difficult.

The reliability of the water supply, and subsequently the economic well-being of many communities, prompted the Washington State Legislature, in 1919, to fund a study of two proposed large-scale irrigation plans for the basin.

During the next several years, many engineering and economic studies were made of the two proposals. The State Legislature, indi-

viduals and private organizations, and the U.S. Congress pondered the plans. Finally, with the recommendation of the U.S. Army Corps of Engineers, a proposal to dam the Columbia and pump water up to the Grand Coulee was deemed most economical and feasible. But by this time, 1932, the Nation was suffering an economic depression and Congress hesitated to fund the irrigation project.

One year later, however, President Franklin D. Roosevelt included the Columbia Basin Project in his Public Works Administration Program. Funds from this program were allotted to the project. Its construction, including Grand Coulee Dam, was assigned to the Bureau of Reclamation. In 1934, the first construction contracts were awarded.



Grand Coulee Dam construction

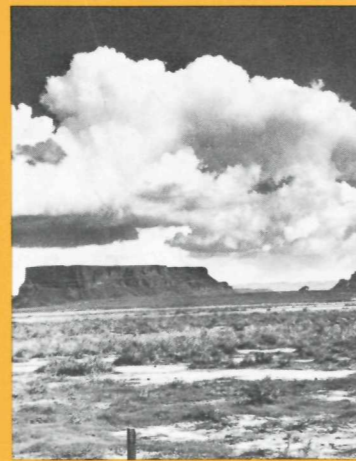
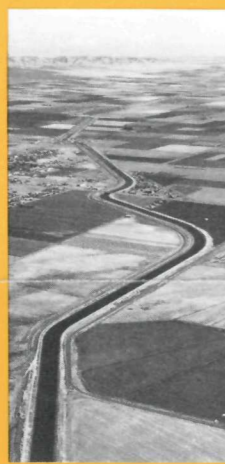
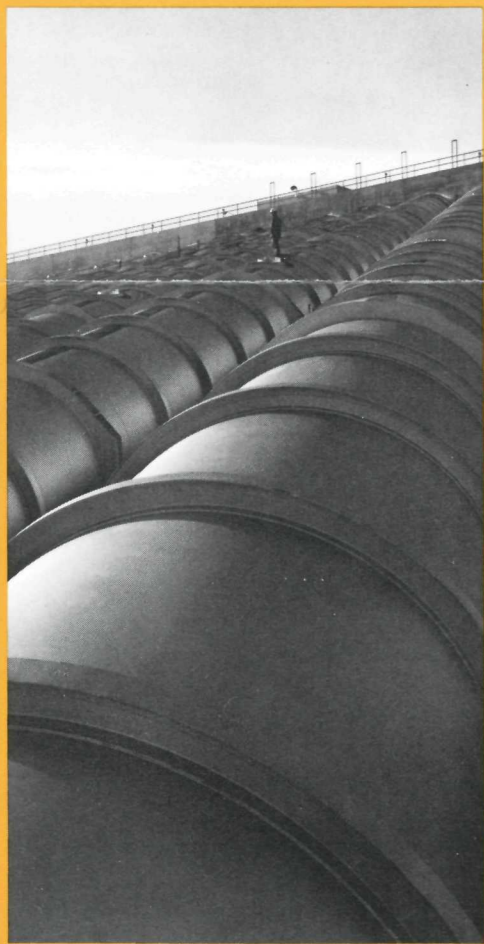
## Grand Coulee Dam

The key to the entire Columbia Basin Project is Grand Coulee Dam, the massive concrete structure which blocks the Columbia River to form Franklin D. Roosevelt Lake. This huge reservoir, a major recreation attraction, extends 151 miles to the Canadian border and makes water available for irrigation and power production. The dam, essentially completed in 1941 and later extended to accommodate additional power facilities, is also operated for flood control, river regulation, navigation, and downstream power production.

The Grand Coulee power facilities consist of the Left, Right, and Third Powerplants and a pump-generating plant. Initial power was produced in 1941. In 1975, power was

generated by the first of six units to be installed in the mammoth Third Powerplant. When all six of these units become operational and two additional units are installed in the pump-generating plant, the Grand Coulee power complex will have a rated generating capacity of 6,480,000 kilowatts. Presently, studies are being conducted to determine the feasibility of enlarging the Third Powerplant, which could bring the total rated capacity of the complex to about 9 million kilowatts. Power produced at Grand Coulee Dam is distributed and marketed throughout the Northwest by the Bonneville Power Administration.

# Columbia Basin Project



## The Irrigation System

Water drawn from Franklin D. Roosevelt Lake by six of the world's largest pumps irrigates more than half a million acres of cropland in the Columbia Basin. The water is pumped to Banks Lake, formed by damming both ends of the 27-mile-long Grand Coulee. From the lake, the water flows through a main siphon, tunnel, and canal to the project's irrigated area that begins about 50 miles south of Grand Coulee Dam. About 2,300 miles of canals and laterals distribute the water to nearly 6,000 farm units now served by the project. The irrigation system includes several other smaller siphons, tunnels, and pumping plants.

Before the irrigation water finds its way back to the Columbia River, much of it will have been recycled throughout the project. Return irrigation flows

from the northern part of the project are collected in Potholes Reservoir and distributed to farms in the southern portion of the project. Some water is reused by pumping it from drains and wasteways, and returning it to the distribution system. Though the annual diversion from the Columbia River to the project is about 2 million acre-feet, re-use of some of the water allows more than 3 million acre-feet to be delivered to project farms.

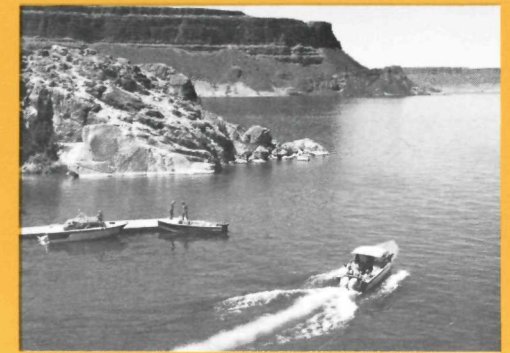
The irrigation system now serves more than 500,000 acres, approximately half of the million-acre project authorized by Congress. Modification of the system, presently underway, will provide water service to an additional 200,000 acres, which are planned for development.

The Grand Coulee (a coulee is a deep ravine or valley) was formed during the Ice Age when a huge glacier dammed a gorge in a bend of the Columbia River. This forced the river to cut a new valley across the bend. When the glacier receded, the river returned to its original bed. The new valley—the Grand Coulee—remained high and dry above the river.

## Recreation

Within the Columbia Basin Project there are 23 designated recreation areas that record a total annual attendance of more than 2 million people. Camping, boating, swimming, fishing, and hunting are favorite recreation activities on project lands and lakes. Trout, bass, and spiny ray draw numerous anglers, many from western Washington, to the manmade lakes and waterways. Waterfowl and upland game bird hunting is a popular activity. The variety of wildlife attracts bird-watchers, photographers, and nature study groups.

## Fish and Wildlife Enhancement



Water, the lifeblood of farms and industry in this once semiarid region, plays another important role - it has transformed much of the basin into a prime habitat for many fish and wildlife species. Over one-third of a million acres of Federally owned lands and water areas are managed for public recreation and fish and wildlife purposes. In large blocks set aside as wildlife refuges, man's use is

regulated to protect the land and wildlife.

During recent years, a Department of the Interior sponsored Youth Conservation Corps Center has been located on the project. In their summer work-study program, high school age enrollees build nesting platforms, dikes that create fish spawning grounds, trails, and other conservation and recreation facilities.



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

## Crops and Livestock Production

Potatoes, sugar beets, alfalfa, hay, wheat, vegetables, and various seeds are principal among the 60 different crops grown in the Columbia Basin Project. In 1978, the total value of crops produced on 505,000 irrigated acres was more than \$225 million. Each acre returned an average of \$412 for the year. Since 1948, when the first crops were produced in the project, the cumulative value of all crops exceeds \$2 billion. Another major source of income is generated from approximately 200,000 cattle which are produced annually in local commercial feedlots. Thousands more are raised on project farms.



## Municipal and Industrial Growth

Stimulated by the increase in agricultural development, the population in the project area has tripled during the last 30 years. New communities have been established and existing towns have grown, though only one has a population exceeding 11,000. The density for the developed area is about 25 people per square mile. Excellent crop production and transportation systems have prompted the installation of agricultural processing facilities, providing employment for several thousand people. Products from the Columbia Basin Project are shipped throughout the United States as well as overseas.

## Costs and Repayment

Payments by water users and revenue from the sale of power produced at Grand Coulee Dam will repay nearly all of the \$2.9 billion that the Columbia Basin Project is estimated to cost. Construction costs allocated to power production are being repaid with interest; those costs associated with the irrigation system are being repaid without interest. About \$70 million, allocated to benefits such as flood control, improved navigation, and fish and wildlife enhancement, will not be repaid to the U.S. Treasury.

## Project Data

**Grand Coulee Dam**  
Total length of dam (axis) 5,223 feet  
Height above lowest bedrock 550 feet  
Concrete content 11,975,000 cubic yards

**Major Reservoirs (total capacity)**  
Franklin D. Roosevelt Lake 9,562,000 acre-feet  
Banks Lake (equalizing reservoir) 1,275,000 acre-feet  
Potholes Reservoir 512,000 acre-feet

**Irrigation Facilities Now Serve**  
543,230 irrigable acres

**Grand Coulee Power Facilities**  
Right Powerplant 1,125,000 kilowatts  
Left Powerplant 1,155,000 kilowatts  
Third Powerplant<sup>1</sup> 3,900,000 kilowatts  
Pumping-Generating Plant<sup>2</sup> 300,000 kilowatts  
Total rated generating capacity 6,480,000 kilowatts

**Grand Coulee Pumping Facilities**  
Pumps (65,000 horsepower) 9,600 cubic feet/second  
Reversible pump/generators (67,500 horsepower) 10,200 cubic feet/second

**Distribution System**  
Main Canals 333 miles  
Laterals 1,959 miles  
Drains and Wasteways 2,761 miles

**Fish and Wildlife, and Recreation Areas**  
390,000 acres

<sup>1</sup> Scheduled for completion in 1979  
<sup>2</sup> Scheduled for completion in 1980

For more information about the Columbia Basin Project write:  
Columbia Basin Project Office  
P.O. Box 815  
Ephrata, Washington 98823