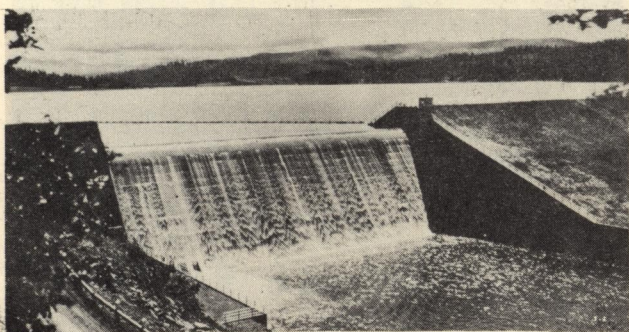
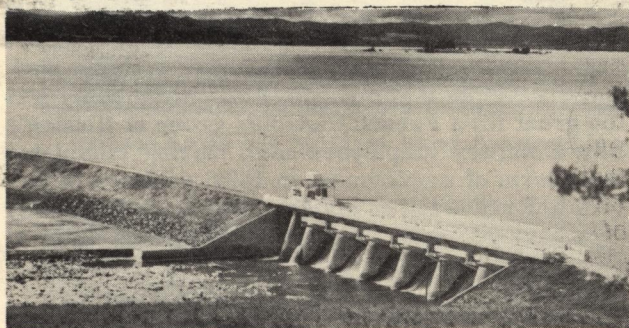


# Cottage Grove and Fern Ridge Dams

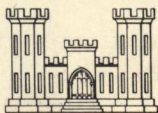


Cottage Grove



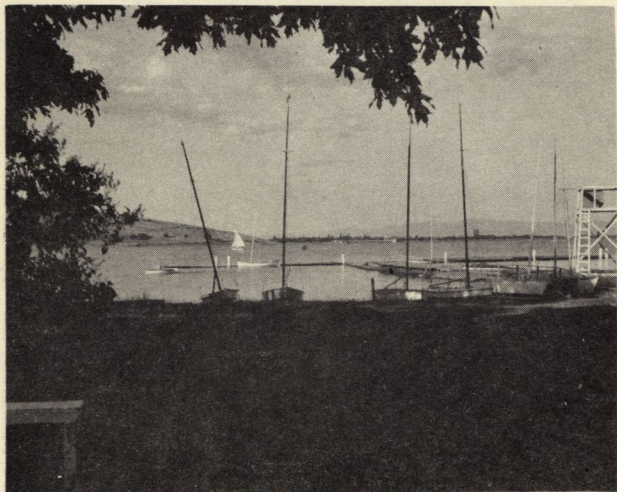
Fern Ridge

Department of the Army  
Corps of Engineers  
Portland District



1948





Boating at Fern Ridge Dam

## The Willamette Valley

Early settlers who came to the Willamette valley after the Lewis and Clark Expedition of 1806 were hunters and trappers who for several years discouraged agricultural development of the land. But the temptation to settle down permanently was too great for a French Canadian group of Hudson's Bay Company employees who, having completed their term of employment in 1829, declined to return to Canada and established farms in the vicinity of Champoeg, about 14 miles above the falls at Oregon City.

Within ten years the stream of immigrants from the Middle West and the Eastern part of the United States commenced to flow into this garden spot of the western coastland. Tales of its fertility spread abroad, and the Donation Land Act of 1850 encouraged additional settlers, many of whom, discouraged by their failure to find gold in California, turned northward in search of agricultural lands and permanent home sites. By 1860, the population of Oregon had increased to 52,000 persons, most of whom lived in the Willamette Valley.

The development of the Willamette Valley was retarded by the havoc of the great flood of 1861. However, in spite of this setback and the recurrence of later floods of less magnitude, the Willamette Basin has become one of the richest agricultural and industrial areas of the United States. Events of recent years indicate a greater development yet to come.

The Willamette Valley comprises 11,200 square miles of drainage area, or nearly the area of Holland. In contrast to the forest-covered and rugged mountains surrounding the Basin, lies the relatively flat valley floor with an area of 3,500 square miles. Most of this gently rolling, alluvial land, extending from above Eugene to the vicinity of Oregon City, lies below an elevation of 600 feet above mean sea level.

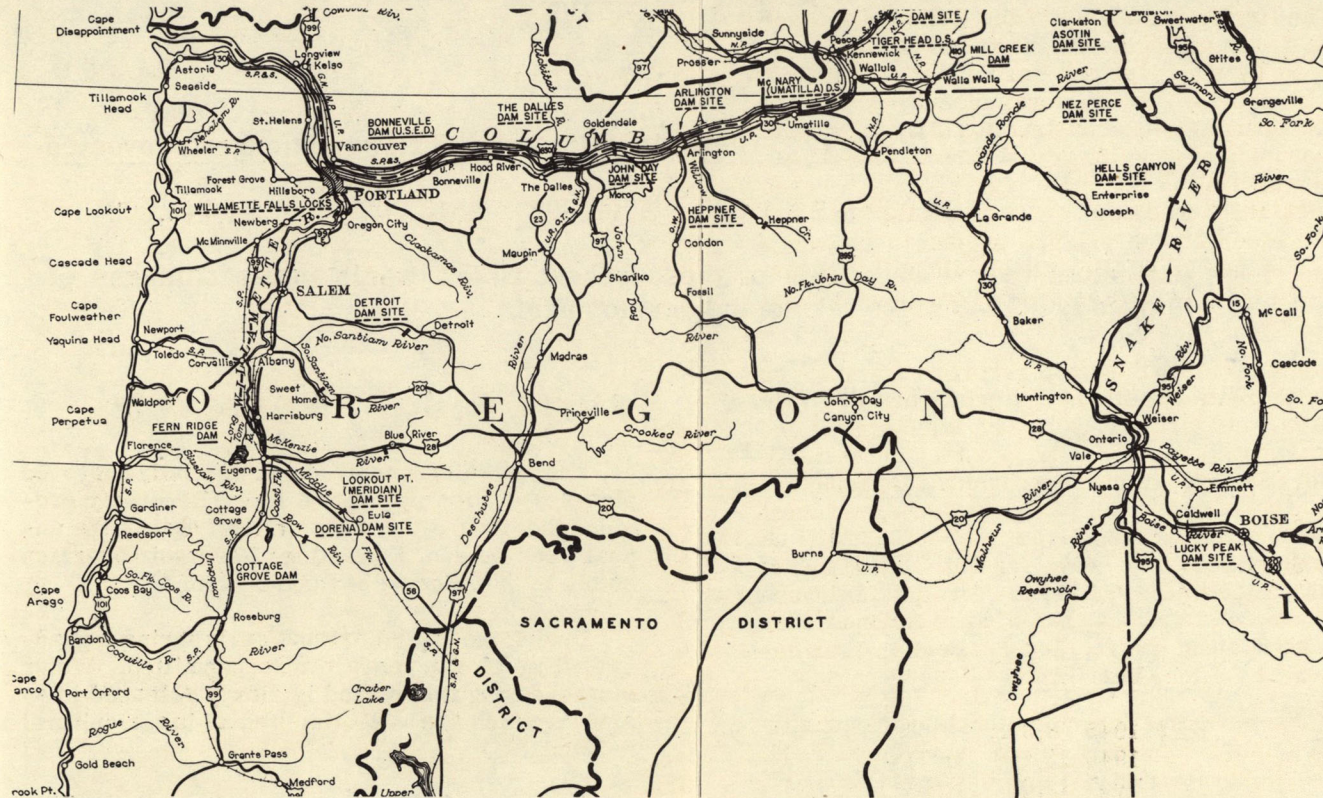
The valley floor climate is mild without extreme variations of temperature. Violent storms are infrequent. The mean annual temperature is 53 degrees and the growing season is approximately 210 days.

The mean annual rainfall in the Basin varies from a minimum of about 40 inches on the valley floor to more than 100 inches in some of the mountainous regions. If the precipitation were fairly evenly distributed throughout the year, it would be sufficient to sustain all forms of agriculture. However, this is not the case, the rainfall during the summer months being very light, and it is not unusual during this period for no rain to fall for 30 to 60 days.

These dry periods are often destructive to crops. Simultaneously very low stages occur along the navigable portions of the Willamette River making year-round navigation difficult on much of the channel. In contrast to this summer scarcity, the heavy precipitation during the winter months presents a constant threat of destructive high water.

During the fall, winter, and spring of practically every year, the discharge of the Willamette River and its tributaries reaches its bankful capacity. Sometimes it spreads over the valley floor with a resultant disruption of communications, damage to cities and farms, and danger to the lives of the residents as well as of livestock.

The 1945 flood inundated 360,000 acres and estimated damages totaled \$9,800,000. Four lives were lost in that flood. The Willamette River flood of December, 1946, exacted a toll of \$5,000,000 on the 232,000 acres covered by the overflow. A repetition of the 1861 flood would inundate to some extent 7,000 farm units, including 3,000 farm, village and suburban homes and stores; in addition to some 18 cities and towns which would be partially inundated, 500,000 acres would be flooded and damages would be approximately \$39,000,000.



## Fern Ridge Dam

Completed in 1942 at an approximate cost of \$4,100,000 including channel improvements, Fern Ridge Dam is located on Long Tom River and Coyote Creek about 12 miles northwest of Eugene. The reservoir has a capacity of 102,000 acre feet.

Formed by an earth embankment, having a maximum height of 44 feet and crest length of 6,360 feet, it has an automatic gate-controlled concrete spillway and outlet structure near the left abutment. Two auxiliary earth dikes along the easterly rim prevent overflow across adjacent low ground.

## Cottage Grove Dam

Located about six miles south of Cottage Grove on the Coast Fork of the Willamette River, Cottage Grove Dam has been in operation since completion in 1942 at a cost of approximately \$2,250,000.

Constructed of earth, with a concrete overflow spillway, it has a maximum height of about 95 feet above foundation and total crest length, including spillway, of 2,095 feet. The reservoir, which has a storage capacity of 33,000 acre feet, is emptied by means of outlet works through the concrete spillway structure near the right abutment.

## Willamette Valley Flood Control Project

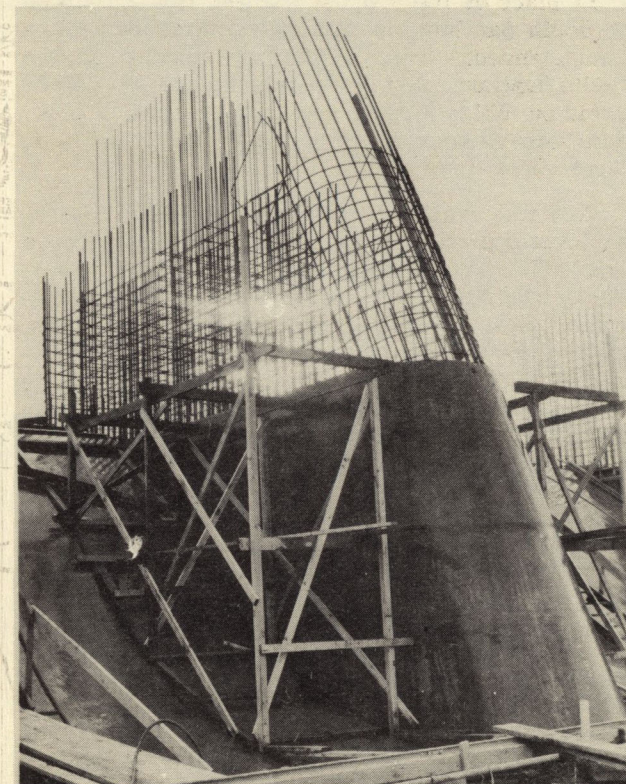
The multiple purpose project of the Corps of Engineers for the Willamette River Valley, adopted by Congress June 28, 1938, is to protect the area against the ravages of floods and conserve water for beneficial use as an aid to the development of navigation, power, irrigation, pollution abatement and other incidental benefits.

The first improvement of the Willamette River by the Corps of Engineers was for navigation. Authorized by the River and Harbor Act of March 3, 1871, it provided for removal of snags, boulders and overhanging trees, construction of training walls and scraping of shoaling gravel bars to afford continuous navigation for light draft vessels between Portland and Eugene. The Rivers and Harbors Act of 1892 modified the original project to include a section of the Yamhill River to McMinnville. Meanwhile, in 1873, private interests completed a canal and locks around Willamette Falls.

Many investigations and reports were made on the Willamette River and its Basin between 1871 and 1937. Before the Corps of Engineers' flood control report of 1937, the most comprehensive plan of development of the stream and its tributaries was contained in the report in House Document No. 308. It became known as the "308" report on the Willamette River. Five separate authorities of Congress, between 1933 and 1936, called for investigations of the river by the Corps of Engineers for navigation, flood control, irrigation and power development.

These investigations and studies were submitted in a single combined report by General T. M. Robins, North Pacific Division Engineer, April 17, 1937. The report, transmitted to Congress in March 1938, with those of the Board of Engineers for Rivers and Harbors and the Chief of Engineers, was published in House Document No. 544. It recommended modification of the existing project for the Willamette River to provide for (1) construction of reservoirs for regulation of stream flow in the interest of flood control, irrigation, navigation, power development, and stream purification, (2) improvement of the navigable channel between Oregon City and Albany, and (3) reconstruction of the locks passing navigation around Willamette Falls at Oregon City.

Congress appropriated sufficient funds to initiate some of these improvements and the Fern Ridge Dam on the Long Tom River and Cottage Grove Dam on the Coast Fork have been constructed. Land acquisition, railroad and highway relocation for Dorena Dam and reservoir were initiated and partially completed when the war stopped all civil construction. Four additional dams and reservoirs at Meridian on the Middle Fork, Quartz Creek on the McKenzie, Sweet Home on the South Santiam, and Detroit on the North Santiam were authorized and were under study when the Japanese struck Pearl Harbor.



Fern Ridge Dam Under Construction

The Corps of Engineers was busy with military and industrial plant construction during the war, but civil planning was not stopped entirely. Work on the railroad and highway relocation necessitated by the proposed construction of Dorena Dam was resumed in June, 1946, and construction of the dam and spillway was initiated in the spring of 1947. Preliminary work was also initiated in the spring of 1947 on the Meridian and Detroit Dams.

Because of changed conditions since the original surveys, a review report has been submitted by the Portland District Engineer.

In place of one dam proposed at the Quartz Creek site near Blue River on the McKenzie River, the following three dams are recommended: Gate Creek Reservoir on Gates Creek, the Blue River Reservoir on Blue River and the Cougar Reservoir on the South Fork of the McKenzie River.



In place of the proposed Sweet Home Dam on the South Santiam, the following three dams are recommended: Green Peter Reservoir on the Middle Santiam, east of Foster, Wiley Creek Reservoir on Wiley Creek, south of Foster and Cascadia Reservoir on the Upper South Santiam River, above Sweet Home.

New reservoirs are also proposed at the following locations: Holley Reservoir on the Calapooya River, Tum Tum Reservoir on the Tum Tum River, Lewisville Reservoir on the Little Luckiamute River, Hills Creek Reservoir on Hills Creek, Dexter Reservoir on the Middle Fork of the Willamette, Fall Creek Reservoir on Fall Creek, White Bridge Reservoir on Middle Quartzville Creek and Big Cliff Reservoir on the North Santiam River.

### Cottage Grove Reservoir

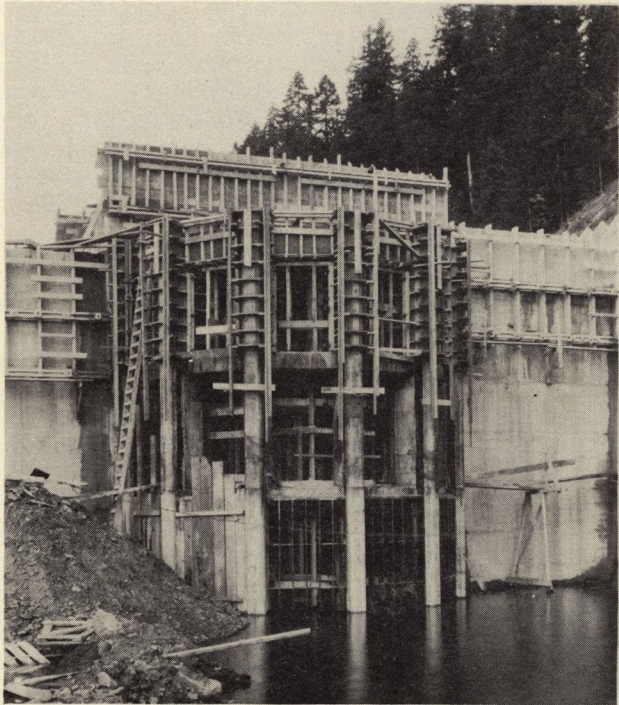
The plan of operation for the Cottage Grove Reservoir provides for the storage of flood waters with a gradual release after the threat of damage has subsided.

A full reservoir, obtained after the end of the flood season, provides water for navigation when released during the low stages in the main stem of the Willamette River, and provides for boating and other recreational activities during the summer months.

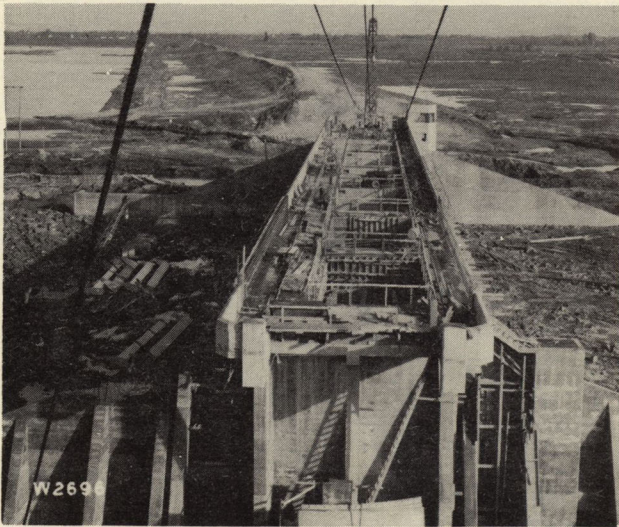
The spillway, which is of the free overflow type, becomes operative only after all storage space has become filled. Outflow is then equal to inflow. No flood has yet filled the reservoir.

Cottage Grove dam and reservoir have already been subjected to thorough tests by the floods of January, 1943, and December, 1945, and have proved their worth.

During these floods the flow of the Coast Fork below Cottage Grove dam was at all times controlled to nondamaging stages. The town of Cottage Grove was afforded complete protection from what would, without control, have been highly destructive floods.



Cottage Grove Dam Spillway Under Construction



Fern Ridge Spillway Under Construction

### COTTAGE GROVE

#### Flood Control Benefits

	1943 flood	1945 flood	1946 flood	1948 flood	Total damages prevented
Damages prevented at time of flood	\$156,000	\$381,000	\$ 98,000	\$510,000	\$1,145,000

It is estimated that a repetition of these recent floods would cause damages of \$1,770,000 based on 1948 price levels and developments.

#### Recreational Use of Cottage Grove Reservoir

Year	Bathers	Fishermen	Hunters	General	Total Visitors
1945	3,408	2,181	203	24,359	30,151
1946	11,542	449	580	32,576	45,147
1947	11,266	340	437	37,121	49,164

Year	Autos	Boat Usage
1945	8,358	562
1946	13,158	2,071
1947	12,061	1,523

For esthetic purposes, a minimum quantity of water is maintained in the reservoir. This quantity, three thousand acre feet, is sufficient for fish life and permits continuation of recreational activities without seriously reducing space available for storage of flood waters.

### Fern Ridge Reservoir

The carefully conceived and officially approved plan of operation of the Fern Ridge Reservoir provides that during the more critical part of the annual flood season, Fern Ridge Reservoir operates solely in the interest of flood control.

During the late winter and early spring a gradual filling of the reservoir is permitted. Water stored during this period is slowly released in amounts which are at all times equal to agricultural demands.

During the fall season, when stages in the Willamette River are normally lowest, the stored waters are released in quantity sufficient to be of aid to navigation. This release depletes the amount of stored water and thus provides storage space for the future flood crests. During the past several fall seasons the release of stored waters has made possible the floating and downstream movement of log rafts which were badly needed by various war industries.

### FERN RIDGE

#### Flood Control Benefits

	1943 flood	1945 flood	1946 flood	1948 flood	Total damages prevented
Damages prevented at time of flood	\$110,000	\$196,000	\$ 13,000	\$507,000	\$ 826,000

It is estimated that a repetition of these recent floods would cause damages of \$1,140,200 based on 1948 price levels and developments.

Fern Ridge Reservoir has a total storage capacity of 102,000 acre feet of which 95,000 acre feet are available for flood control purposes. The dam is provided with a gated spillway automatically controlled so that once filled releases from the reservoir are made equal to the rate of inflow as long as the reservoir remains at full pool elevation.

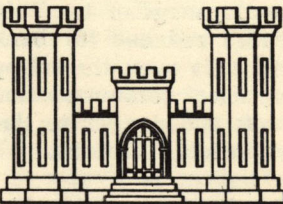
During the past several flood seasons, which have been abnormally adverse, very large benefits have resulted from the operation of Fern Ridge Reservoir.

A full reservoir during the spring and summer months provides a beautiful site for recreational activities and it is extensively used.

#### Recreational Use of Fern Ridge Reservoir

Year	Bathers	Fishermen	Hunters	General	Total Visitors
1945	6,247	23,549	4,386	18,870	53,052
1946	7,060	51,263	5,272	24,282	87,877
1947	8,310	65,955	6,775	33,183	114,223

Year	Autos	Boat Usage
1945	18,978	3,396
1946	27,113	3,516
1947	33,295	5,506



Department of the Army  
Corps of Engineers  
Portland District