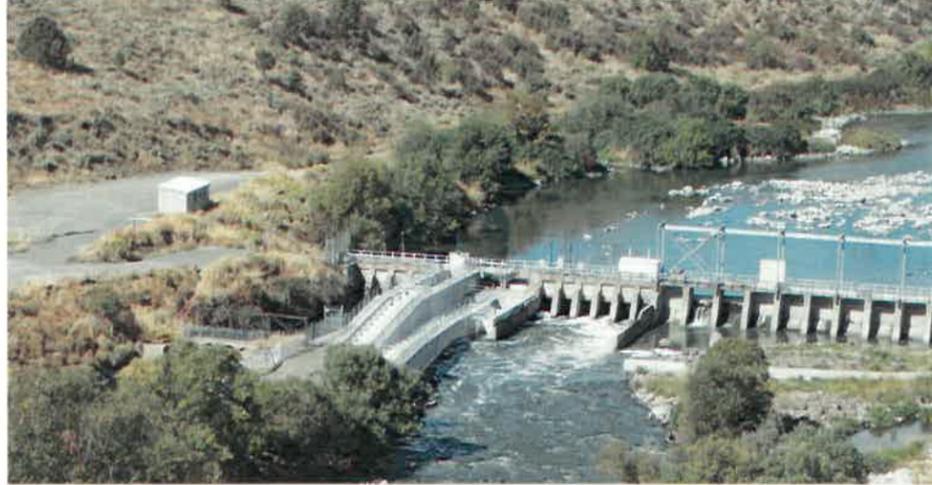


# RECLAMATION

*Managing Water in the West*



**Link River Dam and fish ladder located in Klamath Falls, OR.**

## FACTUAL DATA ON THE KLAMATH PROJECT

### IRRIGATION PLAN

The Klamath Project on the Oregon-California border in Oregon's Klamath County and California's Siskiyou and Modoc Counties was one of the earliest Federal reclamation projects. In early 1905, Oregon and California State Legislatures ceded title in Lower Klamath and Tule Lakes to the United States for project development under provisions of the Reclamation Act of 1902. Construction was authorized by the Secretary of the Interior on May 15, 1905, for project works to drain and reclaim lakebed lands of the Lower Klamath and Tule Lakes, to store waters of the Klamath and Lost Rivers, to divert irrigation supplies, and to control flooding of the reclaimed lands. Under provisions of the Reclamation Act, project costs were to be repaid through the sale of water rights to homesteaders on the reclaimed project lands.

### WATER SUPPLY

Two main sources supply the water for the Klamath Project. One consists of Upper Klamath Lake and the Klamath River, and the other consists of Clear Lake Reservoir, Gerber Reservoir, and Lost River, which are located in a closed basin. The total drainage area which includes the Lost River and Klamath River watershed above Keno is approximately 5,700 mi<sup>2</sup> (1470 x 10<sup>3</sup> ha).

### FEATURES OF THE PROJECT PLAN

**LINK RIVER DAM** on Link River at the head of the Klamath River and just west of Klamath Falls, Oregon, regulates flow from Upper Klamath Lake Reservoir. This reservoir is a principal source of

reinforced concrete slab structure, with a height of 22 ft (7 m) and a crest length of 435 ft (133 m). The reservoir has a capacity of 735,000 acre-ft (907 x 10<sup>6</sup> m<sup>3</sup>) and is operated by the Pacific Power and Light Company, subject to Klamath Project rights.

**GERBER DAM** and Reservoir on Miller Creek, 14 mi (23 km) east of Bonanza, Oregon, provides storage for irrigation and reduces flow into the reclaimed portions of Tule Lake and the restricted sump areas in the Tule Lake National Wildlife Refuge. The dam is a concrete arch structure, with a height of 84.5 ft (25.8 m) and a crest length of 478 ft (146 m). The reservoir has a capacity of 94,000 acre-ft (116 x 10<sup>6</sup> m<sup>3</sup>).

**CLEAR LAKE DAM** and Reservoir on Lost River in California, about 19 mi (31 km) southeast of Malin, Oregon, provides storage for irrigation and reduces flow into the reclaimed portion of Tule Lake and the restricted sump areas in Tule Lake National Wildlife Refuge. The dam is an earth and rock fill structure, with a height of 42 ft (13 m) and crest length of 840 ft (256 m). The reservoir has a capacity of 527,000 acre-ft (650 x 10<sup>6</sup> m<sup>3</sup>).

**MALONE DIVERSION DAM** on Lost River, about 11 mi (18 km) downstream from Clear Lake Dam, diverts water to serve lands in Langell Valley. The dam, an earth embankment with a concrete gate structure, has a height of 32 ft (10 m) and a crest length of 515 ft (157 m).

**LOST RIVER DIVERSION DAM** on Lost River, about 4 mi (6 km) below Olene, Oregon, diverts excess water to the Klamath River through the Lost River Diversion Channel and thereby controls downstream flow in the Lost River to restrict flooding of the reclaimed portions of the

Tule Lake bed and to regulate sumps of the Tule Lake National Wildlife Refuge. It is a horseshoe-shaped, multiple-arch concrete structure with earth embankment wings. The structure height is 42 ft (13 m) and the crest length is 675 ft (206 m).

**LOST RIVER DIVERSION CHANNEL** extends from the Lost River Diversion Dam to the Klamath River, a distance of nearly 8 mi (13 km). The channel carries excess water to the Klamath River and also supplies additional irrigation water from the Klamath River by reverse flow for the reclaimed lakebed lands of Tule Lake.

**ANDERSON-ROSE DAM** on the Lost River, about 3 mi (5 km) southeast of Merrill, Oregon, diverts water to serve the lands reclaimed from the bed of Tule Lake. The dam is a reinforced concrete slab and buttress structure with a height of 23 ft (7 m) and a crest length of 324 ft (99 m).

**MILLER DIVERSION DAM** on Miller Creek, 8 mi (13 km) below Gerber Dam, diverts water to serve lands in Langell Valley. The dam is a concrete weir, removable crest, and earth embankment wing structure, with a height of 32 ft (10 m) and crest length of 290 ft (88 m).

**PUMPING PLANTS.** There are 5 major pumping plants with power input ranging from 450 to 3,650 hp (336 to 2722 kW) and capacities from 60 to 300 ft<sup>3</sup>/s (1.7 to 8.5 m<sup>3</sup>/s), and 40 pumping plants of less than 1,000 hp (746 kW).

**CANALS, LATERALS, AND DRAINS.** There are 18 canals with a total length of 185 mi (298 km) and diversion capacities ranging from 35 to 1,150 ft<sup>3</sup>/s (1 to 33 m<sup>3</sup>/s). Laterals total 516 mi (830 km) and drains 728 mi (1172 total km).

**TULE LAKE TUNNEL.** A concrete-lined tunnel, 6,600 ft (2000 m) in length and with a capacity of 300 ft<sup>3</sup>/s (8 m<sup>3</sup>/s) conveys drainage water from Tule Lake restricted sumps to Lower Klamath Lake.

**KLAMATH STRAITS DRAIN.** The enlarged 600 ft<sup>3</sup>/s (17 m<sup>3</sup>/s) drain conveys drainage water from Lower Klamath National Wildlife Refuge and irrigated land which has been reclaimed from Lower Klamath Lake. The drain, which extends from the State Line Road northwesterly to Klamath River, removes the excess winter flows and the drainage from the lower basin, a closed basin, to the Klamath River.

### IRRIGABLE ACRES

The project area includes 233,625 acres (94 545 ha) of irrigable lands of which 204,492 acres (82 758 ha) were irrigated by the project in 1979.

### SOILS

Soil varies from sandy loam to peaty and clay loams throughout the irrigable areas.

### IRRIGATION SEASON

The average irrigation season extends from April

through September. The growing season varies considerable from year to year, but averages approximately 120 days from about May 15 to September 15.

### PRECIPITATION AND TEMPERATURE

The annual precipitation over the project area averages about 14 in (356 mm). At Klamath Falls temperatures have ranged between recorded extremes of 105 °F (41 °C) and -24 °F (-31 °C). Temperatures average about 67 °F (19 °C) during July and August, 29 °F (-2 °C) during the coldest winter month and about 48 °F (9 °C) for the year.

### PRINCIPAL PRODUCTS AND MARKETS

The principal crops grown in this area are cereal grains, alfalfa hay, irrigated pastures for beef cattle, onions, potatoes, and grass seed. The area is noted for the production of malting barley. With excellent rail connections to San Francisco and Portland, both within a distance of 400 mi (644 km) from the project area, the principal markets for agricultural products are in Oregon and California, and adjoining states.

### BASIN GEOGRAPHY

The Upper Klamath River Basin encompasses an area of about 9,500 mi<sup>2</sup> (2460x10<sup>3</sup> ha), including the Klamath Project service area. The terrain varies from rugged, heavily timbered mountain slopes to rolling sagebrush benches and broad flat valleys. Most of the valleys of the basin are high and comparatively flat; the elevation above sea level ranging from 2,600 ft (792 m) in Scott Valley to 5,000 ft (1524 m) in the Sycan Marsh. The highest of the mountains is Mt. Shasta, 14,161 ft (4316 m) above sea level. Forest lands total about two-thirds of the basin area and most of the remaining third is arable land.

### HOMESTEAD LANDS

Oregon and California legislation which relinquished state title to project lands, and congressional action which directed the project undertaking, provided for disposition of the reclaimed lands in accordance with the 1902 Reclamation Act. Under provisions of the act, the reclaimed public lands were to be opened for homesteading, subject to water right charges designed to repay project costs. The first public lands were opened for homestead in March 1917, for Unit 3 of the Main Division which included 3,250 acres (1315 ha) of private lands and 2,700 acres (1093 ha) of public lands. The 1917 land opening notice announced a construction charge of \$39 per irrigable acre for land already in private ownership and \$45 per irrigable acre for unentered public land. Reclaimed lands in the Tule Lake Division were opened for homestead entry under 10 different public notices - the first in 1922 and the last in 1948. In total, about 44,000 acres (18 x 10<sup>3</sup> ha) making up 614 farm units were homesteaded in the Tule Lake Division. The 1922 homestead notice, later recalled, included a construction charge of \$90 per irrigable acre. Subsequent land

openings in the Tule Lake Division included a construction charge of \$88.35 per acre, contingent on the landowners forming an irrigation district to assume joint liability for construction costs

### PUBLIC LEASE LANDS

As Tule Lake receded, reclaimed lands were leased for farming before opening to homestead. The practice of leasing served to develop and improve the land during the construction of irrigation and drainage facilities to serve farm units and permit homestead entry. To protect developed homestead lands from flooding, areas at lower elevations were designated as sump areas and reserved for flood control and drainage. Some of the marginal sump acreage subject to less frequent flooding was made available for leasing, but retained in Federal ownership. In addition to providing flood control, the reserved sump areas also preserved existing marsh habitat which has subsequently been included within the basin's national wildlife refuge areas.

### NATIONAL WILDLIFE REFUGES

A strategic junction in the routes of the Pacific Flyway, the Klamath Basin annually receives the largest concentration of migratory waterfowl in North America. During migration, the area provides feeding and resting grounds for more than 5 million ducks and geese. By Executive Order in 1908, President Theodore Roosevelt established the Lower Klamath Lake area as the first Federal wildlife refuge for water fowl in the Nation. Today the Klamath Basin is the site of five national wildlife refuges: the Lower Klamath, Tule Lake, Clear Lake, and Upper Klamath refuges within the Klamath Project service area, and the Klamath Forest National Wildlife Refuge north of the project area. In addition to wildlife conservation, a key function of the refuge areas is to decrease crop depredation in California's Central and Imperial Valleys. Refuge areas attract and delay the migrating birds during harvest of rice and other valley crops. Provisions for waterfowl management purposes are included in Public Lease Land agreements to provide for the growing of grain and cereal crops for waterfowl forage. The bulk of waterfowl food is gleaned by the birds from the lease lands after harvest. Additional acreage in the refuge areas is farmed by the Fish and Wildlife Service specifically for waterfowl food, nesting habitat, and cover.

### RECREATION, FISH, AND WILDLIFE

While migrating waterfowl are the most widely recognized wildlife feature of the basin, a variety of other animals, birds, and fish inhabit the area. Game resources include deer, elk, antelope, bear, and cougar. Furbearers include muskrat, beaver, and mink. Upland game birds include 10 species, most notably doves, pheasant, grouse, and quail. Rainbow trout is the most important game fish, found in relatively large numbers and most sought by fishermen. Basin fishery also includes three other major species of trout, two species of

landlocked salmon, and eight species of warm-water game fish. Recreation and tourism, the fastest growing industry, is a vital contributor to the basin's economy. Sport hunting of waterfowl at refuge public shooting grounds brings substantial sums of money into commercial channels each year. The spectacular sight of millions of ducks and geese, and thousands of other water and marsh birds on the Federal refuges is a prime tourist attraction. Klamath Project reservoirs join other federally administered parks and forest areas as major recreation sites, providing opportunities for fishing, swimming, boating, skiing, camping, and picnicking.

### HYDROELECTRIC POWER

By contract executed in 1917, the United States authorized California-Oregon Power Company (now the Pacific Power and Light Company) to construct Link River Dam. The dam, deeded to the United States, is operated and maintained by the power company in accordance with project needs. Under the contract, all irrigation rights and requirements are protected and water users of the Klamath Project are provided for as preference power customers. The original contract was amended in 1956 and extended for a 50-year period.

### OPERATING AGENCIES

Clear Lake Dam, Gerber Dam, and Lost River Diversion Dam are operated by the Bureau of Reclamation; Link River Dam is operated by Pacific Power and Light Company; Anderson-Rose Dam is operated by Tulelake Irrigation District; and Malone and Miller Diversion Dams are operated by Langell Valley Irrigation District. Project canals and pumping plants are operated by the various irrigation districts. Recreational facilities at Lower Klamath Lake, Tule Lake, and Upper Klamath Lake are administered by the Fish and Wildlife Service. The Bureau of Land Management administers Gerber Reservoir recreation facilities. Recreation facilities at Malone and Wilson Reservoirs are administered by the Bureau of Reclamation. National wildlife refuges in the Klamath Basin are administered by the Fish and Wildlife Service as part of the national wildlife refuge system.

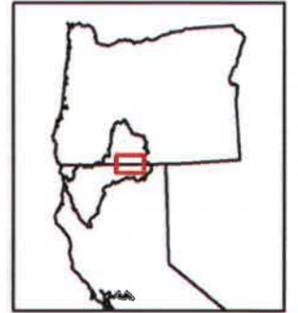
Address all inquiries regarding additional information concerning this project to:

Bureau of Reclamation Public  
Affairs Office, 6600 Washburn Way  
Klamath Falls, OR 97603  
<http://www.usbr.gov/mp/kbao/>



# Klamath Project

Southern Oregon ~ Northern California



- Ady District Improvement Co
- Colonial Realty ID/West S
- Emmitt District Improvement Co
- Enterprise ID
- Horsefly ID
- Klamath Drainage Dist
- Klamath ID
- Langell Valley ID
- Lower Klamath NWR
- Malln ID
- Midland District Improvement Co
- Poe Valley Improvement District
- Pine Grove ID
- Plevna District Improvement Co
- Shasta View ID
- Sunnyside ID
- Tule Lake ID
- Van Brimmer Ditch Co

