

Deschutes Project

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The Deschutes Project

A number of candidates on the list of second generation federal irrigation projects were too wild, too remote, and of too little value to excite the Bureau of Reclamation. One notable example was Oregon's Deschutes River basin. First proposed at the turn of century, wariness over starting a federal project in this wilderness emanated from central Oregon's pine forests and wheat fields and reached all the way to Washington, D.C. Some in this region were in favor of irrigation at any cost, but others were against the institution of repayment schedules and other perceived burdens the government might bring. The partnership of poverty and drought that almost broke the West in the 1930s, finally brought engineers and irrigators together in their thinking on the Deschutes. Once they reached agreement on the project, the largest concentration of Civilian Conservation Corps (CCC) enrollees the depression era West had ever seen initiated construction. Ironically, the CCC units were reinforced during World War II by a group of conscientious objectors who helped to guide the project towards its completion in the late 1940s. The single-purpose structures of the Deschutes Project may be simple in design, but they do feature examples of mid-century cutting edge technology built by an unusually large labor force of divergent abilities.

Project Location

The Oregon found in postcards is a land of pine trees and rain, but in actuality, east of the Cascade Mountains it is a desert high and primordial. Pure-born of glacial run-off from the east slope of the Cascades, the Deschutes River traverses over 75 miles of this desert terrain, spanning a 30-mile wide basin. Some 15 million years ago, a river of molten lava welled up through surface fissures, covering much of central Oregon in a layer of basalt. Once the earth cooled, wind and water dispersed a light, sandy loam over the volcanic rock, ash and cemented gravel. The breeze dispenses a reminder of the birth pangs of this region, as one commentator said it seems, "20 million acres of windblown volcanic dust settles in a gritty film on your teeth"

after a visit.¹

The project's nucleus is the North Unit; a 133,000 acre lava plateau bounded on the west by the Deschutes River. Directing the river to irrigate the counties of Crook, Deschutes and Jefferson are the following Reclamation designed structures: Wickiup Dam and Reservoir, Crane Prairie Dam and Reservoir, Haystack Dam and Reservoir, the North Unit Main Canal and lateral system, and the Crooked River Pumping Plant. Fifty thousand irrigated acres comprise the North Unit Irrigation District. An additional 47,000 acres receive supplemental supply through the privately built delivery and distribution systems of the Central Oregon Irrigation District and Crook County Improvement District No. 1.

The drying winds of summer, and a high evaporation rate following a rainstorm, make it difficult for seeds to germinate. On the Project there is wide variation in the length of the growing season from the average of 88 days near the town of Bend to the 130 days near the communities of Redmond and Madras. Rainfall also varies from 12.74 inches annually at Bend to the 8.34 inches falling on Redmond, ten miles to the north. Winters are long and cold and snow often blocks the passes leading in and out of the Cascades to the west. Nature provided a limited amount of space and a brief number of days in which to grow and cultivate. It was a situation where irrigation was necessary increasing the odds in man's favor.²

Historic Setting

The coincidences binding the past with the present are seldom obvious. However, one such connection was unearthed in the late summer of 1934, when John Isackson, a Reclamation employee digging test pits at the proposed Wickiup damsite, uncovered three obsidian knives. Thanks to the care Isackson employed at the time of his discovery, a few years later, a University of Oregon anthropologist determined man existed in central Oregon around the ice age. The glimmer of survival offered by a river linked prehistoric "Deschutes Man" to the irrigation

1. Ted Leeson, "Nothing but the Facts," in *Audubon*, (March-April, 1994): 36-7; Kent S. Ehrman, "Unusual Geology in the Deschutes Basin, Oregon," in *The Reclamation Era*, (April, 1941): 128-30.

2. Ehrman, "Unusual Geology in the Deschutes Basin, Oregon," 128.

objectives of modern man.³

Centuries later the Klamath tribe called the Deschutes River, *Kolamkeni Koke*, or "place where the wild root kolam grows." In the journals of Lewis and Clark, they referred to the river by another Indian name *Toworenhiooks* when they first sighted it on October 22, 1805. On their return trip, the two trailblazers called the stream Clarks River, in honor of William Clark. A little more than a decade later, when the area was trapped by French Canadian fur traders, the stream's proximity to the falls of the Columbia River earned it the name *Riviere des Chutes*, or River of the Falls. The following generation of English-speaking pioneers corrupted the French description into the modern place name.⁴

Settlers rushing toward the Pacific Coast during the mid-nineteenth century barely stopped in the Deschutes Basin on their way to the Willamette Valley. After the Civil War, the cattle of a few local stockmen, including those of more established ranchers from west of the Cascades, grazed the Deschutes grasslands during the summer. Timbermen followed, lured by virgin pine forests, and they soon established the town of Bend as central Oregon's logging capital. Water was first diverted from a tributary of the Deschutes, Squaw Creek, for irrigation west of Redmond in 1871. Between 1893 and 1908, a number private ditch and irrigation companies claimed water rights from the Deschutes and its tributaries. One of the first works, completed in 1900, diverted water from a dam south of Bend to irrigate 45,000 acres of land now part of the Central Oregon Irrigation District. Almost immediately, these early small canals and diversion dams stimulated a change in local agriculture from grazing to wheat production.⁵

Watching the efforts of the local firms to water the basin, both the federal and state governments began to take interest in this neglected strip of Oregon. The first comprehensive study of all irrigation possibilities in the Deschutes Basin was released jointly by the State of Oregon and the federal government in 1914. Formed two years later, the North Unit Irrigation

3. L. S. Cressman, "The Wikiup Damsite," in *American Antiquity*, (1, 1937): 62.

4. Lewis A. McArthur, *Oregon Geographic Names*, (5th ed.), (Portland, Oregon: The Press of the Oregon Historical Society, 1982), 218-9.

5. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 3, 1945-7, 96.

District, issued bonds to finance investigation and construction of a project to water 133,000 acres. Unfortunately, only \$90,000 worth of bonds were sold out of the \$5 million needed for the planned project. In 1922, the United States Reclamation Service (USRS), and the state government, issued another study resulting in a \$500,000 federal appropriation to begin building a storage works at Benham Falls, some eight miles south of Bend. A meeting was held in Madras between land owners and the Director of the USRS, Arthur P. Davis, to discuss terms of the contemplated construction contract. The owners rejected Reclamation's plan because they would have had to sell all land in excess of 160 acres at the government's appraisal price. Federal irrigation of the Deschutes River basin became only a topic of conversation among Oregonians for the next decade.⁶

The lack of a large irrigation system, did not prevent other smaller efforts from going ahead. At Crane Prairie, southwest of Bend, the North Unit Irrigation District built a log-crib, rockfill dam under terms of the Carey Act in 1922. That dam irrigated some 40,000 acres belonging to the Central Oregon, Arnold, and Lone Pine irrigation districts. Very soon after the dam was finished, Crane Prairie was troubled with leaks almost every season, and repairs by the irrigation districts were slowed by haphazard financing. Concurrently, a few larger districts merged with or swallowed a number of smaller firms. At the close of the 1920s, the Central Oregon Irrigation District, the Arnold Irrigation District, Crook County Improvement District No. 1, (also known as the Lone Pine Irrigation District), and the North Unit Irrigation District remained.⁷

A cycle of above average rainfall nurtured prosperity for irrigators and small businessmen. Thanks to an annual average of 10 inches of rain between 1900 and 1920, almost 80,000 acres were in cultivation across the basin. Increased acreage allowed a few successful wheat growers to consolidate the farms of smaller producers into larger holdings. Wheat's

6. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 1, 1938, 7-8; Norman Delmar Kimball, *The Impact of Economic and Institutional Forces on Farmer Adjustments in the North Unit Deschutes Project*, unpublished Ph.d thesis, Oregon State University, Corvallis, 1961, 16.

7. Kimball, *The Impact of Economic and Institutional Forces on Farmer Adjustments in the North Unit Deschutes Project*, 1.

profitability meant modernization and increased contact for central Oregon with the outside world. After World War I, a pipeline distribution system at Opal Springs in the Crooked River Canyon furnished a domestic water supply for the towns of Madras, Culver and Metolius, and surrounding farmland. The arrival of two railroad lines, and a trans-state highway (now U.S. 97) running through Madras and Bend, provided direct access to the rest of the Pacific Northwest.⁸

There was a 23 percent increase in the number of farms in Deschutes County from 1925 to 1930, a number exceeded by only three other counties in the state of Oregon during the same five years. At the moment the financial and social health of the region reached its zenith, farming on the basin became a victim of its own success. As yields attained a high of 25 to 30 bushels per acre, a dry spell combined with an exhaustion of the natural flow to deplete local supplies of water. In the first years of the Depression, a considerable acreage of seeded land was not harvested, and in 1934, there was a complete crop failure on account of drought. Conditions pushed the local irrigation districts to petition the federal government to buy out a power company holding an off-season non-irrigation claim on the Deschutes and renovate the Crane Prairie Dam. The possibility of dependable irrigation led one individual to speculate, "Give these districts an adequate supply of water and farmers will be as prosperous as in any section of the United States."⁹

Project Authorization

If the basin's water users only sought a federally sponsored touch-up of Crane Prairie Dam, Reclamation's sights were set toward a more comprehensive project -- renovation and the creation of a totally new facility downstream. Months of drought had driven some along the Deschutes to beg the federal government: "Is it too much to look to the strong arm of the federal government to do this? A dole is not asked for. We simply ask federal assistance to avert a

8. C. C. Fisher, "CCC Aids in Construction of the Deschutes Project," in *The Reclamation Era*, (May, 1939): 101.

9. L. K. Cramb, "The Irrigation Situation in Central Oregon: A Proposal That the Federal Government Provide Storage," (Bend, Ore.: 1931), 18; *The Impact of Economic and Institutional Forces on Farmer Adjustments in the North Unit Deschutes Project*, 14. Cramb was secretary of the Bend Chamber of Commerce in 1931.

catastrophe." However, both sides of the issue soon divided on methods and cost.¹⁰

Not everyone inside Reclamation felt the situation was as dire as some in central Oregon made it out to be. A 1931 Reclamation report strongly advised "no government funds should be expended" on "poor and ill-conceived projects" like Deschutes. In the opinion of the Superintendent of the Yakima Project, Porter J. Preston, the reclamation of central Oregon would repeat other ventures "the Bureau of Reclamation has constructed and is trying to get rid of without any hope of recovering the construction costs."¹¹

Despite Porter's misgivings, Reclamation undertook one more investigation of the Deschutes Basin, focusing on all storage possibilities above the Crooked River. The federal government allotted \$30,000 for this research. The results of the two volume study, published in July, 1936, convinced Reclamation's leadership to proceed with the Deschutes Project.¹²

If there was skepticism among some Reclamation staffers before authorization, that mood shifted to a few farmers soon after the 1936 report came out. The study concluded Reclamation should build a big reservoir servicing almost all the North Unit and eliminating the need to rehabilitate Crane Prairie Dam. Reclamation did not want to construct a new reservoir directly below a rickety, wood dam, but they did not have the legal authority to remove Crane Prairie. On the North Unit, most water users argued improvements to Crane Prairie should be the Bureau's first priority, as a larger dam would increase the rate of repayment schedule. The situation had one Bend-area farm wife so agitated, she wrote to First Lady Eleanor Roosevelt asking her to personally intercede in the situation. As a confrontation loomed, the Bureau's district counsel in the Portland office, Bernard Stoutemyer, advised then Chief Engineer Chester C. Fisher to rebuild Crane Prairie as quickly as possible due to the "public importance" of the project, and the persuasive "influence of the districts," on the opinions of local irrigators.

10. Cramb, "The Irrigation Situation in Central Oregon: A Proposal That the Federal Government Provide Storage," 20.

11. U.S., Department of Interior, Bureau of Reclamation, *Report of Present Irrigation Conditions with Respect to Certain Canals and Irrigation Districts on the Deschutes River, Near Bend, Oregon*, (1931), 23 1/2. Later in the 1930s, Preston would be Reclamation's senior engineer in the early days of the Colorado-Big Thompson Project.

12. *Annual Project History, Deschutes Project*, Vol. 1, 1938, 8.

Reclamation decided to accede to the local water users' will putting the new dam on hold.¹³

Culminating more than 20 years of investigations, Acting Secretary of the Interior Theodore A. Walters signed the *Finding Regarding Feasibility of Project* on September 24, 1937. President Franklin Roosevelt approved the terms of construction five weeks later. The feasibility document stated that out of a budget of \$8 million, \$2 million of construction needed to be done with out any repayment charges to project water users. An army of young men from across the country forged by the depression – the Civilian Conservation Corps (CCC) – would provide the labor to get the project underway. In the brief life of the CCC, its role in Reclamation construction projects was often ancillary. No one could have speculated how deeply involved the CCC would be in getting Deschutes off the ground.¹⁴

Construction History

In the spring of 1938, the site of the Wickiup Reservoir was a 11,000 acre forest of ponderosa and lodgepole pine. This lush forest sustained an average of 900 trees on each acre. A local lumber company removed the commercial timber, and the balance was left to the axes and heavy equipment of the CCC. On other New Deal projects, the CCC cleared brush and performed other non-mechanical tasks. But on Deschutes, enrollees operated power shovels and dump trucks for loading and hauling embankment material, bulldozers for uprooting timber and stripping foundations, and tractors with heavy rollers for spreading and compacting the dam's fill. The young men assigned to the Deschutes Project performed these types of tasks with greater frequency than did the men on most other CCC projects in the West. Eighteen-and-nineteen-year-olds from Indiana, Kentucky, and Northern Oregon formed the first units on the Deschutes Project.

Their first six months on the job were busy ones, as an eight mile road from Pringle Falls to Camp Wickiup was cleared of timber and graded, and thirty-four camp units were completed. From July, 1938, and over the next five years, the CCC did not raze the forest as much as they

13. U.S., Department of Interior, Bureau of Reclamation, Record Group 115, *General Correspondence*, Box 538, File 979-D-2. (Record Group hereafter referred to as RG 115).

14. "Deschutes Project Found Feasible," in *Engineering News-Record*, (November 11, 1937): 770; Fisher, "CCC Aids in the Construction of the Deschutes Project, 102.

whittled it away. Country and city boys laid waste to the forest in every way conceivable -- with axes, saws, dynamiting, and burning. The cry of "Let Her Go," followed by the rushing rumble of a dynamite blast signaled another advance for the corps. By the Fall of 1939, after a year-and-a-half of work, "the C's," had cleared 717 acres for a damsite.¹⁵

Although two units of men arrived in July 1938, those stationed at Camp Wickiup roughed it in tents for 10 months until permanent housing was complete. Based one-half mile south of the town of Redmond, the 600 men stationed at Camp Redmond blasted and excavated rock riprap for the banks of the 65-mile North Unit Canal. Forty-five miles southwest of the town of Bend, on a high promontory overlooking the Deschutes River, Camp Wickiup housed an additional 600 enrollees. These men cleared timber from the site of the Wickiup Reservoir, stripped the damsite, dug the cutoff trench, and placed impacted earth for the reservoir embankment. Soon, Camps Redmond and Wickiup were the largest CCC units in the West.

Similar to other CCC projects, enrollees at Camps Wickiup and Redmond were paid \$30 each month with food, clothing, housing, medical and dental care provided. Each man was given \$8 in cash monthly with the remaining \$22 allotted to dependents, or set aside until he left the corps. One commander was responsible for both units, a situation unique among other multiple camp setups elsewhere in the corps. Reclamation was charged with supervision of the enrollees only during working hours.¹⁶

Despite the opportunities camp life promised, throughout the CCC presence in central Oregon, there was much inter-governmental wringing of hands over the character of most of the enrollees. A year into the job, the Administrative Inspector of the CCC, Homer D. Graham, wrote enrollees responsible for clearing and clean-up were "doing considerable loafing." An additional cause of distress was the poor attendance at Camp Redmond's evening educational programs. The classes were designed to offer cerebral stimulation, but drew few participants,

15. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 2, 1939, 24-5.

16. RG 115, *General Correspondence, CCC Deschutes, Oct. 1939- May 1940*, Box 541, File 979-E; RG 115, *General Correspondence, Deschutes, CCC, February through July, 1941*, Box 540, File 979-E; "CCC Aids in Construction of Deschutes Project," 115.

because attendance was not mandatory. Construction Engineer Fisher explained to Commissioner John C. Page there were "no restrictions to prevent the boys from immediately getting up from the table in the evening and going over to the city." The charms of "the city" of Redmond, Oregon, may have not compared with Paris, or even Portland, but for the average 19-year-old after a day in the woods, there were enough delights to be found in a town of a few hundred people.¹⁷

Over his 35-years with Reclamation, Chester C. Fisher rose from an engineering aide, to the authorship of the Bureau's 1922 investigation of the North Unit, before achieving the position of construction engineer for the Deschutes Project in July 1939. In early 1940, Fisher left to lead preliminary investigations on a proposed Reclamation scheme in the nearby Willamette Valley. Another long-time Bureau staffer, Deane S. Stuver, succeeded Fisher. Stuver previously oversaw CCC-Reclamation operations from 1933 to 1936.¹⁸

On August 24, 1939, Boise's Vernon Brothers construction firm began a 300 day race to renovate Crane Prairie Dam and build a new spillway. Under the terms of a \$98,560 federal contract, the new dam would be approximately 230 feet upstream from the first Crane Prairie. Working late into the fall and winter months, the old timber and rockfill Crane Prairie Dam did not go without a struggle. Making the job especially difficult were two to three foot logs held together by 3/4-inch drift bolts, and an adjoining spillway made of planks spiked to the logs. In places where the dam was exposed above water, its timber was saturated with oil and burned. Dynamite loosened the remainder for removal by dragline.¹⁹

The new Crane Prairie Dam is 36 feet high with a 285 feet long crest, and when filled, its reservoir holds 55,300 acre-feet and covers 4,940 acres. The core of the embankment and nearby spillway are both formed from six-inch layers of a clay, sand, and gravel mixture. The upstream side is covered with 24 inches of rock riprap while the downstream face is finished with rockfill. The refurbished spillway is an uncontrolled weir carved out of an 80-foot wide

17. RG 115, *General Correspondence*, Box 541, File 979-E.

18. "Reclamation Engineers Receive New Assignments," in *The Reclamation Era*, (March, 1940): 68.

19. L. R. Brooks, "A New Crane Prairie Dam," in *The Reclamation Era*, (April, 1942): 90.

channel through the rock of the left abutment. The spillway is 20 feet wide and six feet high, and its crest is 280 feet long. On the dam's right abutment, the outlet works consists of a fish screen, outlet control structure a horseshoe-shaped conduit, and a stilling basin. Overlooking the works is a 12-sided, 29-foot tall tower that supports 12 steel fish screen panels. A crane mounted on a central pivot inside the tower lifts the screens in and out of position. The new-and-improved Crane Prairie Dam went into service by the fall of 1940. Once completed it was time for Reclamation to devote its energies to the project that brought them to the Deschutes basin in the first place.

Wickiup Dam was planned as a zoned earthfill structure standing a hundred feet high with a crest 13,860 feet long, and with a 30-foot wide gravel road on its crest. The design of the dam's impervious core is overlaid by upstream and downstream zones of sand and gravel topped with three feet of rock riprap. In compliance with Forest Service requests, dam material was taken from within the reservoir area. During construction, the silt used to create the embankment would turn fluid and its placement was often difficult to control. Moving the materials created a more serious problem a few years later when the reservoir's floor leaked as water was released into it. The dam and the nearby dike contain 1.8 million cubic yards of material. Work started on the Wickiup Dam and Dike in 1939, but the intervention of World War II delayed completed until 1949.²⁰

In August 1939, a low bid of \$154,653.50 won C. J. Montag and Sons of Portland, Oregon, the right to tackle the most intricate aspect of the Wickiup design, the outlet works. The original plans for Wickiup Reservoir called for a conventional spillway at the end of the dam, but Reclamation decided the river's steady flow meant a possible flood would have to be taken through the outlet gates and spillway with little difficulty. The redesign meant a savings of \$200,000. Separate from the main dam, the East Dike is part of the overall impounding structure. The dike is 3,400 feet long and 25 feet above the lowest point of the saddle across which it is built. The Wickiup Reservoir covers 11,170 acres and holds nearly 200,000 acre-feet

20. U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Wickiup Dam*, (Denver: 1981), 1-5.

of water.²¹

Earlier reports agreed it was highly unlikely the Deschutes would flood. Favored with a temperate flow, Reclamation's hydraulic engineers designed two 90-inch diameter control valves, known as "tube valves" to control the river. The new design was an improvement over the standard needle valves, because it was lighter, cheaper, and less susceptible to damage. The valves also reduced erosion of the outlet works by discharging the river's flow into a concrete stilling basin. The unit required an electric motor to drive a screw opening and closing the tube against the seat at the valve's downstream end. Wickiup, and Shasta Dam in California, are the only Reclamation structures utilizing tube valves. As Wickiup neared completion, the once-innovative tube valves were technologically obsolete by the end of the 1940s, superseded by the development of the more efficient and economical hollow-jet valve.²²

America's entry into World War II demanded more of its citizens for the military and for war industry jobs. These demands meant a drop to a total of 181 enrollees in both camps by the end of 1942. The industriousness of wartime CCC enrollees did not improve according to Reclamation staffers, as the "enrollment of younger and less responsible boys," resulted even in "less work efficiency." This atmosphere changed in late December 1942, as the federal government ended the CCC program, and brought in a hundred Mennonite conscientious objectors to Camp Wickiup. Soon after their arrival, Construction Engineer Clyde H. Spencer commended the Mennonites for presenting "a very good appearance, comparable to men who would be found on the average college campus."

After a few weeks in the woods, their work equaled or exceeded the productivity of the previous five years of CCC enrollees. The Mennonites' efficiency lasted only a year, as they were moved to other camps and replaced by different groups of increasingly lethargic conscientious objectors. From 1944 to the end of the war, men not bound by any religious tenants on the value of doing a good day's work, sluggishly cleared the Wickiup reservoir site.

21. RG 115, *General Correspondence*, Box 534.

22. U.S., Department of Interior, Bureau of Reclamation, *Dams and Control Works*, (3rd ed.), (Washington, D.C.: United States Government Printing Office, 1954), 210, 212.

Camp Wickiup eventually closed in July 1946, ending an unique chapter in the federal use of labor.²³

Each aspect of the Deschutes project came equipped with its own set of hurdles, but for length and difficulty of conditions, the most arduous element was the completion of the North Unit Canal. The canal begins its 65 mile journey at the Deschutes River north of Bend before ultimately reaching the Agency Plains north of Madras. Crossing alternating stretches of irrigated and undeveloped land for 26 miles, the canal eventually meets the Crooked River. The lava spires and knobs of the cliffs above the Crooked River provided the backdrop for the most difficult stretch of canal building. This forbidding section was chosen after studies found it to be the most economically viable route, despite predictions that "every foot of the canal will entail a fight."

The Crooked River crossing would require a 120 inch diameter steel pipe supported by a bridge. Before the contract was awarded in late 1941, the country was at war and the project was laid aside. Two years later, the plan was revived, but the war-time priority for plate steel forced a switch to concrete. The closed concrete box flume, supported on an arch type concrete bridge, is 772 feet in length. The structure carries a thousand cfs over the 150 foot deep canyon. In addition, workers dug two tunnels totaling 1.3 miles in length in the vicinity of Smith Rock. Various laterals between mile 30 to mile 64 distribute water to 50,000 irrigable acres. A number of different aspects of the 235-mile distribution system were completed between 1946 and 1949, as the work was divided among Bureau forces, government crews and private contractors.²⁴

A sunny day, picnic lunches and a carnival atmosphere marked May 18, 1946, celebrating the first rush of water through a lateral to the George Rodman farm south of the town of Culver. Eight thousand people attended the event in person, and a 22 station radio network broadcast the ceremony throughout the Pacific Northwest. As the gate lifted, a quartet serenaded

23. RG 115, *General Correspondence*, Box 542, File 979-F; U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 6, 1943, 61, 65-6; *Annual Project History, Deschutes Project*, Vol. 10, 1947, 31.

24. "Unusual Geology in the Deschutes Basin, Oregon," 130; "Flume Crosses Canyon on a Rigid Frame," in *Engineering News-Record*, (October 3, 1946): 86-7; U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 10, 1947, 6-7.

the crowd with the tune "Cool Water." On that day, the project was divided into 642 separate units averaging 77 acres, but only half of those units were eligible for deliveries.²⁵

However, the exhilaration of the first delivery was overshadowed by the events surrounding "The Big Leak." When first designed, engineers believed sediments at the bottom of the Wickiup Reservoir would provide an adequate seal to prevent seepage. In 1945, as the reservoir was reaching partial fill, Reclamation discovered water gushing through broken sediments and the underlying lava bedrock. Two years later, as storage reached its maximum capacity, other faults, crevices and sinkholes multiplied, allowing almost a thousand acre-feet per day to be lost through gaps as big as 60 feet wide and 20 feet deep.

Reclamation responded by excavating and filling the openings with rock, sand and gravel, and placing compacted layers of impervious material over leaking areas. An earthen plug raised the height of the emergency spillway crest and increased the reservoir's capacity to 200,000 acre-feet to help counteract losses. A drainage system also controlled any remaining seepage. A little more than a decade after the first tree fell, all aspects of the Deschutes Project were fully operational by April 1949. However, it was soon evident one element was missing to help speed deliveries of water throughout the project.²⁶

Post-Construction History

Three to four days was just too long a journey. That was the time it took for water to travel from the Wickiup Reservoir to the northern reaches of the project in the early 1950s. Construction of an additional structure would satisfy unexpected demands, reduce the amount of wasted water, and cut delivery time down to hours. The site chosen for the dam and reservoir was situated along a 20-mile stretch of unprotected canal. This heavily cultivated section had been damaged after a major break in the Main Canal in 1953. Some operators stated if a dam and reservoir had been in existence, the damage to private property would have been held to a

25. *Bend Bulletin*, 20 May 1946, p. 1, 4; *The Impact of Economic and Institutional Forces on Farmer Adjustments in the North Unit Deschutes Project*, 1.

26. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 11, 1948, 39-40, 42; *SEED Report on Wickiup Dam*, (Denver: 1981), 4-6.

minimum.²⁷

Named for a nearby creek and butte, the Haystack Dam and Reservoir is located about 11 miles south of Madras. The reservoir formed by Haystack Dam covers 233 acres and holds 5,635 acre-feet. The man-made lake is filled by water directed from the Main Canal through a feeder canal 2,500 feet long with a 600 foot outlet canal returning releases back to the Main Canal. Haystack Dam is unique as it does not have a spillway provided in the design of the structure. Unlike reservoirs fed by moving streams where storage is dependent on natural flow and seasonal variations, Haystack Reservoir is under control at all times. The outlet works is used as a service spillway, and the reverse flow in the Haystack feeder canal serves as the emergency spillway. The outlet was cut into the dam's foundation near the right abutment. The dam was built on a rock foundation with 508,200 cubic yards of back filled zone material comprising its embankment. The R. A. Heintz Construction Company of Portland beat out 17 other competitors with a low bid of \$721,802 for the right to build the dam. Work started May 29, 1956, as construction reached a peak a year later, when an average of 33 men were employed as general laborers at \$2.35 an hour.²⁸

The North Unit Irrigation District built a pumping plant in 1968, at the point where the Main Canal crosses the Crooked River. The plant provides supplemental water when needed by pumping from the Crooked River and discharging into the North Unit Main Canal. Each of the nine vertical shaft pumps are powered with a 450-horsepower motor forcing the water into a 60-inch steel-pipe discharge line 220 feet long.²⁹

The languid nature of the Deschutes River is complemented by functionality of the structures impounding it. Sharing similar designs, materials and construction histories, the three dams of the Deschutes Project were facing the difficulties of middle age by the mid-eighties.

Crane Prairie Dam, only 12 miles upstream from Wickiup Dam, has always been considered a

27. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 16, 1955-60, 26.

28. U.S., Department of Interior, Bureau of Reclamation, *Final Construction Report on Haystack Dam and Reservoir, Deschutes Project, Oregon*, (Culver, Ore.: 1958): 5, 17-8; *Annual Project History, Deschutes Project*, Vol. 16, 1955-60, 28; U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Haystack Dam*, (Denver: 1990): 2.

29. *Annual Project History, Deschutes Project*, Vol. 23, 1973-4, iv.

high hazard facility due to its proximity to Wickiup if a natural disaster should occur. The structure itself remains "safe and stable." Reclamation judged Wickiup Dam to be in satisfactory condition needing only occasional filling of leaks and clearing every two years of tree stumps on the upstream face of the main dam and East Dike. The most recently completed works, Haystack Dam and Reservoir, were also listed in stable condition with none of the seepage problems that marked the beginnings of Crane Prairie and Wickiup.³⁰

Settlement of Project

Central Oregon is one of the battlegrounds where two philosophically differing forces collide over the direction of the modern West. Timber, ranching, and farming have been the pillars of this region, but since 1970, growth in this area has mushroomed faster than any other part of the state, bringing new economic choices. Many newcomers carry with them the hope of creating a better life, but often drag along much of what made their old homes undesirable.

In February 1944, an old point of contention between the federal government and local irrigators was resolved after the water users formally requested the limitation on land holdings be increased to 160 acres for a man and wife. Reclamation Commissioner Harry W. Bashore concurred with their request, stating the original limitation had no economic justification. One-hundred-and-sixty would be the average number of acres per grower by the end of the century.

A brief span after the war marked the golden age of agriculture along the Deschutes basin. The importance of farming in people's lives and the region's economy was emphasized in the celebration of events like the annual "Weed Holiday." Initiated in June 1952, and observed for many years thereafter, local businessmen, ditch riders and water users met on canal banks and near lateral systems across the project armed with shovels for killing or collecting weeds. Weeds were the enemy of Deschutes' prize crop, clover seed, and as long as there was money to be made in clover, Weed Holiday was more than a get-together, it was an affirmation of civic

30. *SEED Report on Wickiup Dam*, 8; U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Crane Prairie Dam*, (Denver: 1986): 8; U.S., Department of Interior, Bureau of Reclamation, *SEED Report on Haystack Dam*, (Denver: 1990), 1-6; U.S., Department of Interior, Bureau of Reclamation, *Geologic Report for Modification Decision Analysis (MDA) Haystack Dam Deschutes Project Oregon*, (Boise: 1993), iii-iv.

survival.³¹

Similar to the rest of the nation in the late 1960s, signs of non-conventional behavior descended on Oregon, even reaching the quiet, hard-working ranching and timber towns of the basin. Long hair, commune living and eastern-influenced religions sent a cultural tremor through a community where pick ups and cowboy boots had ruled for generations. One character apart from this pack was the Bhagwan Shree Rajneesh. Followed by his entourage, the Bhagwan in his Rolls Royce made the 70 mile trip from his compound in Antelope south to Madras each day to drink a soda pop then turn around and leave. The vision of herds of his blissed out followers terrorized politicians in three central Oregon counties during the early years of the 1980s. However, the Bhagwan's eventual deportation back to India prevented him from any takeover moves. In the years since, for those seeking a better life at the foot of the Cascades, the signs were mixed. Individuals of retirement age found the area attractive, as there were more people past 65 in central Oregon than the national average. The fate of those still in the work force was increasingly determined by the drift of small town Oregon toward service industry jobs so prevalent that there were "more motel maids than cowboys" by the 1990s.³²

For those in the basin whose lives still center around cultivation, the Deschutes Project has been a success. As of 1991, of the 14 projects constructed by Reclamation solely for Oregonians, Deschutes ranked fifth in overall project population, but only second behind Owyhee in total crop value with \$35.9 million. A little over 27,000 acres were in alfalfa and different types of hay that year, followed closely by some 24,000 acres of irrigated pasture land. As it had been since the first settlement of central Oregon, the largest population center on the project was Bend with 20,469 people in 1990. A total of 9,111 individuals received water from the project in that same year.³³

31. U.S., Department of Interior, Bureau of Reclamation, *Annual Project History, Deschutes Project*, Vol. 15, 1952-4, 37; *Annual Project History, Deschutes Project*, Vol. 16, 1955-60, 275; *The Impact of Economic and Institutional Forces on Farmer Adjustments in the North Unit Deschutes Project*, 21.

32. Bill Gulick, *Roadside History of Oregon*, (Missoula, Montana: Mountain Press Publishing Co., 1991), 272-3; Thomas Vaughan, (ed.), *High & Mighty: Select Sketches About the Deschutes Country*, (Portland, Oregon: Oregon Historical Society, 1981), 267.

33. U.S., Department of Interior, Bureau of Reclamation, *1991 Summary Statistics: Water, Land and Related Data*, (Denver: 1991), 134-63; U.S., Department of Commerce, Bureau of Census, *1990 Census of Population and* (continued...)

Uses of Project Water

The cliché "rolling in clover" is synonymous in America for good times and prosperity. In the days when that phrase was at the height of fashion, growers on the Deschutes Project found out you could not count on clover as a money maker. In a brief period after the completion of Wickiup and Crane Prairie Dams, Deschutes-grown ladino clover was the feed keeping the nation's cows contented. Clover seed, "put the project on its feet," in the opinion of one local irrigation veteran. Local hay and potatoes were marketed only as far as the Willamette Valley and the Pacific Coast, but Deschutes clover was sold as far east as Chicago.³⁴

In the late-1940s and early 1950s with potatoes and Ladino clover paying good money, many farmers went heavily into debt buying expensive equipment or new cars. With little warning, the bottom fell out in 1952 when the government pulled support of price control programs for both crops. Farmers quickly plowed under their clover fields and sowed grains. Land not planted in grain soon supported various grass seeds, primarily Marion bluegrass. Grass seed grown on the project is now harvested and marketed around the world. On New Year's Day 1955, the operation and maintenance of the Crane Prairie and Wickiup works was transferred from Reclamation to the North Unit Irrigation District. At the same point in the fifties, a few peppermint producers from the Willamette Valley crossed the Cascades to plant 561 acres of mint. At the dawn of the sixties, mint's acreage grew to 2,846 and brought in \$777,020. Diseases like wilt, reduced its status somewhat, but production in the early 1990s still collected \$6.4 million. Quick reaction saved many farm families from financial collapse.

Experimentation with new crops and agricultural methods continues. Some experiments, like dairying, never caught on, as the change from clover to grasses killed any chance of a substantial dairy and cattle industry. Others, inspired by the growers of Gilroy, California, introduced garlic along with cultivating onion and coriander seeds. A few newcomers from Idaho, California, and elsewhere in Oregon, have come to farm, but most of the land has been

33. (...continued)

Housing, Pacific Division, Oregon, Vol. 1, Washington, D.C.: 1991, Summary Tape File 1A.

34. Telephone interview with Chuck Schonneker, July 6, 1994. Schonneker is manager of the North Unit Irrigation District based in Bend.

held by the same family from generation to generation. The ability to adjust to changing markets demonstrated by Deschutes growers in the past will likely continue to be their trademark in the future.³⁵

Conclusion

A venture not initially popular with water users and engineers, the success of the Deschutes Project illustrates that compromise and adaptability pays in the long run. Deschutes represented opportunities for a previous neglected region to grow, to introduce diverse farming practices, and provided a chance for a group of young men to gain a sense of accomplishment and develop in a time when opportunities had been just about crushed by the Depression. It is a legacy of achievement that overshadows the circumstances surrounding the project's beginnings.

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35. Kimball, *The Impact of Economic and Institutional Forces on Farmer Adjustments in the North Unit Deschutes Project*, 2-3; *Annual Project History, Deschutes Project*, Vol. 16, 1955-60, 70-1; Interview with Chuck Schonnek, July 6, 1994.

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