

## WATER RESOURCES

Although the subject of water resources has received brief consideration in other portions of this account, the importance of water to Shasta County history merits at least a summary comment in any study of the area.

This region is well endowed with liquid resources. Three principal drainage basins—the Pit, McCloud, and Upper Sacramento, which presently unite in Shasta Lake—represent a drainage of some 6,600 square miles. Two major creeks, Clear and Cow Creeks, add nearly seven hundred miles between them, while Cottonwood and Battle Creeks, neither totally in Shasta County, add more. On the valley floor, Shasta County receives approximately thirty-six annual inches of precipitation, while on the Modoc Plateau some seventeen to twenty-seven annual inches add to the water supply of the Pit and its tributaries. All of these statistics involving a total of 5,800,000 annual acre feet of runoff, combine to make Shasta County one of the greatest water producing areas of California.

Man early realized the usefulness of the abundant water supply of this region for his practical needs. The aborigines of Shasta County fished the Sacramento, the Pit, and the other streams of the county. Likewise the earliest trail blazers, whether Hudson's Bay trappers from the north, or American mountain men from the south, typically followed the lines of prominent streams, utilizing their value as a natural means of travel. The earliest settlers in what was to become Shasta County also appropriated her water resources for a variety of purposes. Some, including Sam Hensley, shipped timber from the forests to southern settlements via the Sacramento River. Pierson B. Reading, the area's first permanent settler, spent considerable effort and money to promote steamboat travel on the Sacramento. However, his efforts proved ineffectual. In addition, early fish hatcheries promoted this aspect of the Shasta County water picture as far back as the 1860's.

By far, the most important early use of Shasta County water was in the extraction of gold. Not only must the individual argonaut avail himself of a stream of water for his rocker, long-tom, cradle or sluicibox, but also the mining companies which developed were in equally urgent need of the precious liquid. This need led to the construction of ditches, such as the Clear Creek, Duffy's, and Andrews Ditches, particularly in the western reaches of the county. In addition, the distinctiveness of the wet and dry season locally prompted the necessity of water storage—thus bringing about the building of reservoirs. With the coming of hydraulic mining, new problems arose. Among these were the filling of the river with debris, the destruction of agricultural land, and the pollution of streams in Shasta County. As a result of these problems, both national and state laws were passed prohibiting the pollution of streams by debris, and bringing an end to many mining concerns.

With this action in the 1880's and 90's came the initial attempts at irrigation projects. These often used the same ditches and reservoirs which had formerly assisted the miner. Travel by canal was also considered during this era. As early as 1883 the *Republican Free Press* of Redding announced the following water project:

McGardner, one of the principal parties interested in the scheme for taking water out of the Sacramento River is in town . . . the company is about formed . . . (it plans) a canal six feet deep and sixty feet wide from Sacramento River near Redding to Red Bluff to Suisun City for boats, lumber, etc.

This particular system never materialized.

The voluminous publicity effort presented by Shasta County citizens to outsiders during the 80's did not neglect to mention her abundant, but unharnessed water resources. A county description circular, published in 1885, listed several of the major Shasta County waterways, which, it stated: "assured water privileges unlimited." Another article, intended for immigrant perusal, stressed "the fine advantage of water power for milling and manufacturing privileges." However, little of this water power was utilized as yet, and most of the immigrants coming to Shasta County found it necessary to rely on the some forty annual inches of rainfall to water their crops.

Municipal water systems, such as they were, had been developed at both Redding and Anderson in the 1880's. As far back as 1880 a ditch company was formed in the Whitmore district to

tap the water available to that area from south Cow Creek. There was much discussion locally during the last decades of the 19th Century about irrigation systems. This was encouraged, particularly by the Wright Act of 1887—a law intended to stimulate development of California's water resources. However, very little would be accomplished until after the beginning of the 20th Century.

Another aspect of Shasta County's water resources, hydroelectric power, was activated at about the turn of the century. Since the inception of hydroelectric power development in California, men had viewed the streams of Shasta County with keen interest. Of particular significance was the natural power design of Pit River. This stream, which originates in the Cascade Mountains in the northeast corner of Modoc County, utilizes some 4,900 square miles of watershed to form a veritable powerhouse of available energy. In particular, the steep descent of the Pit from near Fall River Mills to its arrival in the valley floor presented what has been termed a "step-ladder of power." Exploratory ventures into this region began in 1875 with an investigation by civil engineer, J. R. Scuphan, into the hydroelectric potential of the Pit. Scuphan and a companion, William Lieber, daringly hazarded a boat trip down the river from Fall River Mills to Copper City. Lieber lost his life in the venture. Despite the certified potential of this and other Shasta County streams for hydroelectric power, actual utilization of this resource had to await the economic need for electric power which only industry could bring.

The Shasta County copper boom provided this impetus. In the year 1900, a San Francisco businessman, H. H. Noble, conceived a plan to harness the power useable in Battle Creek to supply the abundant market available in the copper mines above Redding. However, Noble was not the first to present electric power to Shasta County. By 1891 Redding was providing her citizens with electric power from a small, low-head plant located on the Sacramento River near the city. Noble, in contrast, projected a much larger system. To assure the success of his venture he obtained a long-term contract to supply power to the Mountain Copper Company near Keswick. On the basis of this assured market, Noble built his initial hydroelectric plant on Battle Creek near Shingletown. This Volta power plant was immediately successful. In 1901 and 1902 Noble was able to purchase the small companies supplying power to Redding and Red Bluff and renamed his entire operation the Northern California Power Company. During the next two decades the growth of Noble's hydroelectric enterprise was phenomenal. With the expansion of the copper industry down to 1910, the Northern California Power Company gained many new markets. In addition to the commercial demand, Noble also supplied the power requests of numerous Sacramento Valley cities and towns; his lines extended as far south as Dunnigan, as well as west to Weaverville by 1917. To sustain these new outlets, more power plants were added. To expand the initial Volta output, a third generator was added in 1903. In rapid succession came plants at Kilarc on Cow Creek in 1904, and on South Battle Creek in 1909, as well as two additional Battle Creek installations, Inskip in 1910, and Coleman in 1911. With the building of these new power outposts and the acquisition of some nineteen antecedent hydroelectric concerns, Noble had created a power empire in northern California which he now called Northern California Power Company Consolidated. As yet, however, the power potential of the Pit and its tributaries had not been tapped.

Pacific Gas and Electric Company, a leading hydroelectric concern in central California, was the operator which would unlock the door to this potential. In 1917 PG&E bought out the Pit River rights owned by a group called the Mount Shasta Power Company, whose attempts to utilize the Pit had been thwarted by financial problems. Then in August, 1919, PG&E acquired the holdings of H. H. Noble and the Northern California Power Company Consolidated.

This transaction in 1919 had been prompted in particular by a series of dry winters which created a power drain upon PG&E resources in central California. In general, the move had been motivated by the awareness of increased hydroelectric power needed in the industrial growth of the Sacramento Valley following World War I. PG&E had recognized the resources of the Pit as a logical answer to this need.

The 20's witnessed a concerted expansion program by PG&E. The initial projects were two moderately-sized plants on Hat Creek, a tributary of Pit River. Both Hat Creek 1 and 2 were completed in 1921. By diverting Fall River one mile above the town of Fall River Mills and bringing the water to Pit River by tunnel, the first project on the Pit itself was consummated in

1922. Ten miles downstream from Pit 1 came Pit 3, completed in 1925. To facilitate the transmission of power to the Sacramento Valley, a large substation was completed at Cottonwood in the same year.

This survey of the hydroelectric use of Shasta County water resources takes this study well into the 1920's. It is necessary now to back track briefly in order to summarize other salient events which took place in the development of Shasta County water resources in the early 20th Century. Along with the development of hydroelectric energy came the question, who should operate this service, particularly in municipal areas. During 1916, while the city of Redding was still supplied by the Northern California Power Company, a group of citizens began a movement to acquire a municipal lighting system. After a five-year fight in which local citizens battled both the Northern California Power Company and its successor, PG&E, Redding in 1921 became the first city in northern California to acquire a public electric utility.

At about the same time, a group of progressive Shasta County citizens formed an organization called the Northern California Irrigation Association to encourage utilization of the area's abundant water resources. Their prodding led to a Bureau of Reclamation study in 1915 on the feasibility of a dam to be built on Pit River, one-half mile above Squaw Creek. This 136-foot high structure, to be called Sheeps Rock Dam, was to supply water for the irrigation of 55,000 acres east of the Sacramento River and east and north of Redding. This project did not leave the drawing board, however. Two systems, the Anderson-Cottonwood Irrigation District and the Happy Valley Land and Water Company, were instituted in the years immediately approximating World War I. Their inception has already been described in the chapter on agriculture. In summary, these projects contributed a great deal to agricultural development in Shasta County. Both faced serious financial crises during the Depression, the Happy Valley enterprise actually never recovering stability until the 1960's. Nevertheless, these irrigation systems did make available Shasta County water to the farmers of this region.

In addition to the public utility and agriculture usage of Shasta County water, recreation also benefited from this abundant natural resource in the early 1900's. During the height of Mount Lassen's eruptions between 1915-1917, the area around this active volcano was dedicated as a national park. This conservation action was accomplished in August, 1916. Although not primarily a water resource area, Lassen Volcanic National Park does offer fishing and boating activities on Manzanita, Reflection and Butte Lakes, as well as other smaller streams and lakes. The beauty of Burney Falls was also preserved by the creation of the McArthur-Burney Falls State Park in 1921. This action was followed by the creation of Lake Britton behind Pit 3 in 1925. Thus, by the end of the twenties, Shasta County was beginning to realize at least a portion of her water power potential. The area would wait, however, until the 1930's to witness the most significant water resources action—the building of Shasta Dam.

The story of Shasta Dam is one of paramount importance to Shasta County. The background to the erection of this vast structure extends as far back as 1873 when President Ulysses S. Grant engaged a corps of army engineers to investigate irrigation needs of northern California and make a congressional report of their findings. Further investigation and planning over the years culminated in the "State Water Plan" of 1930, an overall approach for water development within the Central Valley basin. This further prompted the passage in 1933 of the Central Valley Project Act by the state legislature. Central Valley Documents, Section 4, summarized the following units and the major purposes of these structures:

. . . a dam, reservoir and hydroelectric plant . . . on the Sacramento at or near Kennett, Calif. . . . The unit to be designated as Kennett Dam and used primarily for improvement of navigation of the Sacramento River to Red Bluff, for increasing flood protection in the Sacramento Valley, for salinary control in the Sacramento-San Joaquin delta, and for storage and stabalization of the water supply of the Sacramento for irrigation and domestic use and secondarily for the generation of electrical energy and other beneficial uses.

Keswick Dam was also made a part of this plan, and the name of the major structure subsequently changed to Shasta Dam. Since the state was not able to finance this tremendous undertaking, an appeal was made for federal assistance for the CVP. As a result, money was appropriated through the passage of the Rivers and Harbors Bill in August, 1935. The building of this vast structure

was granted to a consolidation of sixteen construction firms principally drawn from the Pacific Coast area. This combination was entitled the "Pacific Constructors, Inc." Their successful bid was for \$35,939,450.

The actual construction of Shasta Dam took place between September, 1938, and November, 1944. At the helm in directing its building was Frank T. Crowe, a well-known construction engineer, whose previous achievements included Boulder, Bonneyville and Parker Dams. Affectionately dubbed "the old man" by the crews under him, Crowe was responsible for leadership in the solution of the multiple problems connected with such a project. Included in this category was the diversion of the Sacramento River, excavation of the dam site, the relocation of railroad and highway arteries, and the conception of a single pivotal tower system to facilitate the pouring of concrete for the structure. Another significant innovation, engineered by the Columbia Construction Company under Henry Kaiser, was a 9.6 mile conveyor belt which carried gravel aggregates from a point near Redding to Shasta Dam.

Many additional problems accompanied Shasta Dam. Labor strife was averted by an early contract with the American Federation of Labor; Wartime brought a number of irritating conditions, but construction was continued as the government classified the building of Shasta Dam a vital defense project. The growth of the area around the construction site produced further complications. In October, 1938, at about the time Secretary of Interior, Harold Ickes, came west to dedicate the structure, the Redding *Record* termed the housing situation in and around Redding "tense and becoming more acute every day." One real estate agent lamented that he knew of only one available listing, and that was nearly twenty miles from the dam site in Anderson. With the alleviation of the housing problem by the rapid erection of Summit City, Central Valley, Project City, and Shasta Dam village in a wilderness of red clay and pine trees near the dam, new problems ensued and were met. Medical needs were provided for in a modern twenty-five bed hospital provided by the company; educational facilities were hurriedly erected; water and sewer problems were curtailed with systems which prevented serious health problems; and the "after-work" climate for the families of over 2,000 construction workers was stimulated by the inception of a number of civic, cultural, and recreational groups.

At the end of 1941, the Redding paper, in summarizing the erection of the dam and its effect on the adjacent area, stated:

Shasta County has been a beehive of construction activity during 1941, a year in which the dam passed the halfway mark. Nearly two million cubic yards of concrete were poured . . . All railroad relocation projects were completed with the exception of Pit River Bridge; Keswick Dam was begun and is now well underway . . . (There was) a steady payroll of 2,200 to 2,400 men throughout the year.

By the conclusion of operations in 1944, Pacific Constructors had erected an installation 602 feet high with a crest length of two-thirds of a mile, impounding a reservoir of four and one-half million acre feet. The power plant at Shasta Dam was California's largest involving five generators of 75,000 kilowatt capacity each. A few miles down stream from this tremendous structure was Keswick Dam, equipped with a power plant of three generators of 25,000 kilowatt capacity each. This smaller afterbay dam was built "to regulate and balance the water release from Shasta Dam in order that the maximum use for all purposes might be realized."

Not only did the building of Shasta Dam create a tremendous reserve of hydroelectric energy, but the reservoir formed behind the dam provided a recreation area of major significance. Camping, boating, fishing, swimming and water skiing were among the many recreation activities provided by Shasta Lake.

By the mid-50's the water resources of Shasta County had been harnessed in many ways for the use of man. At that date PG&E was constructing another plant, Pit #4, having completed Pit #5 in the mid-40's. In addition, the Department of Water Resources listed nine irrigation service agencies in the county. Included in this total was one commercial company (the Happy Valley concern), one irrigation district (the A-CID), as well as seven smaller mutual water companies. These did not include the municipal water supplies of Shasta County, of which there were some half dozen. Nineteen small dams, some relics of the gold mining era, existed in the county to provide these water facilities.

Foremost among the water development endeavors of the late 50's and early 60's, however, was the Trinity River Project. Resulting from federal legislation passed in August, 1955, spear-headed by Congressman Clair Engle, this enterprise envisioned a major addition to the Central Valley project. Although couched in technical terms, the essence of the Trinity River Act was contained in the following paragraph in which the law authorized:

The building of the Trinity River division consisting of a major storage reservoir on the Trinity River . . . a conveyance system consisting of tunnels, dams and appurtenant works to transport Trinity River water to the Sacramento River and provide . . . such control and conservation of Clear Creek flows as the Secretary determines.

As with the Shasta venture, the Trinity project aimed not only at power development, but sought to provide recreation, fish and wildlife conservation, and flood control locally, as well as irrigation water to areas ranging from Shasta County southward to central California. Within the confines of Shasta County, the Clear Creek tunnel and power plant, the Whiskeytown Dam and reservoir, as well as the Spring Creek tunnel and power plant brought new jobs, plus a changed appearance to the area.

The Trinity Project legislation also included authorization of two major water projects in Shasta County. One of these, the Cow Creek project, authorized construction of a system of pipelines to deliver water to an area of approximately 27,000 acres of land located east of Redding, generally between the Sacramento River and Cow Creek, prompting the Bella Vista Water District. The second, the Clear Creek South unit, provided for a pipeline from Whiskeytown Dam to Happy Valley, with sufficient additional pipelines to distribute water throughout the Happy Valley area.

Recreation resources, a bountiful endowment to this area, were also receiving expanded use by the end of the 50's. Fishing, available both in mountain streams like Hat Creek, Squaw Creek, Fall, Rising and McCloud Rivers, and the valley area including the Sacramento River, Battle Creek, and Shasta Lake was likewise multiplied. Shasta Reservoir (Lake), available for both water sports and fishing, was a major recreation center, as well as Burney Falls, which in 1960 welcomed some 65,000 visitors.

By 1962, PG&E announced plans for immediate construction of a McCloud-Pit River complex which took three years to build and cost upwards of \$100 million. Three new hydroelectric plants added 330,000 kilowatts of generating capacity to the PG&E system. This vast undertaking, when combined with the facilities of the existing public and private systems, in addition to the Trinity River Project, placed the county's hydroelectric output at approximately 1,118,300 kilowatts. In addition, the state was evidencing renewed interest in the upper Sacramento basin area through its "Upper Sacramento River Basin Investigation." A progress report on this study was published in May, 1961, with the entire report scheduled for completion in the mid-60's.

County government was likewise displaying its concern over water development. In 1955 the Board of Supervisors created within the county government its own Department of Water Resources. The principal function of this agency was: "to coordinate matters pertaining to water resources development and . . . for cooperating with federal and state agencies and individuals participating in water resources development investigations affecting Shasta County." At about the same time a citizens' advisory group called the Shasta County Water Resources Board was also initiated. Two years later the Shasta County Water Agency was established to "provide the activities necessary to obtain projects." These county agencies were especially active in the effort to assure multiple use of the Sacramento River by the Kimberly-Clark Corporation in their proposed construction of a pulp and paper mill near Anderson, this use contingent upon the recommendations issued by the State Water Pollution Control Board.

The year 1965 marked a significant milestone in recreation development in the county with the signing of Public Law 89-336, creating the Shasta-Trinity-Whiskeytown National Recreation Area. This major water use development was brought into being through the work of many individuals and agencies. Major among these was the Shasta County Recreation Commission, created in 1961. Recreation was also enhanced locally in the mid-60's by the origination of the Reading Island recreation facility in the southern county area. Cottonwood Creek seemed to be a prime object of multi-purpose water developments as the 60's came to an end. The Corp of

Engineers reports recommended two large reservoirs for that southern Shasta County stream. Trinity River drainage activity also seemed to point to water transportation to and through the county.

As a result of these activities, Shasta County appeared certain to retain its position as a major water supply county of California. Not only did the county lead all others in the amount of developed water, as well as volume of water exported, but it was increasingly supplied locally through application of its own abundant resources.