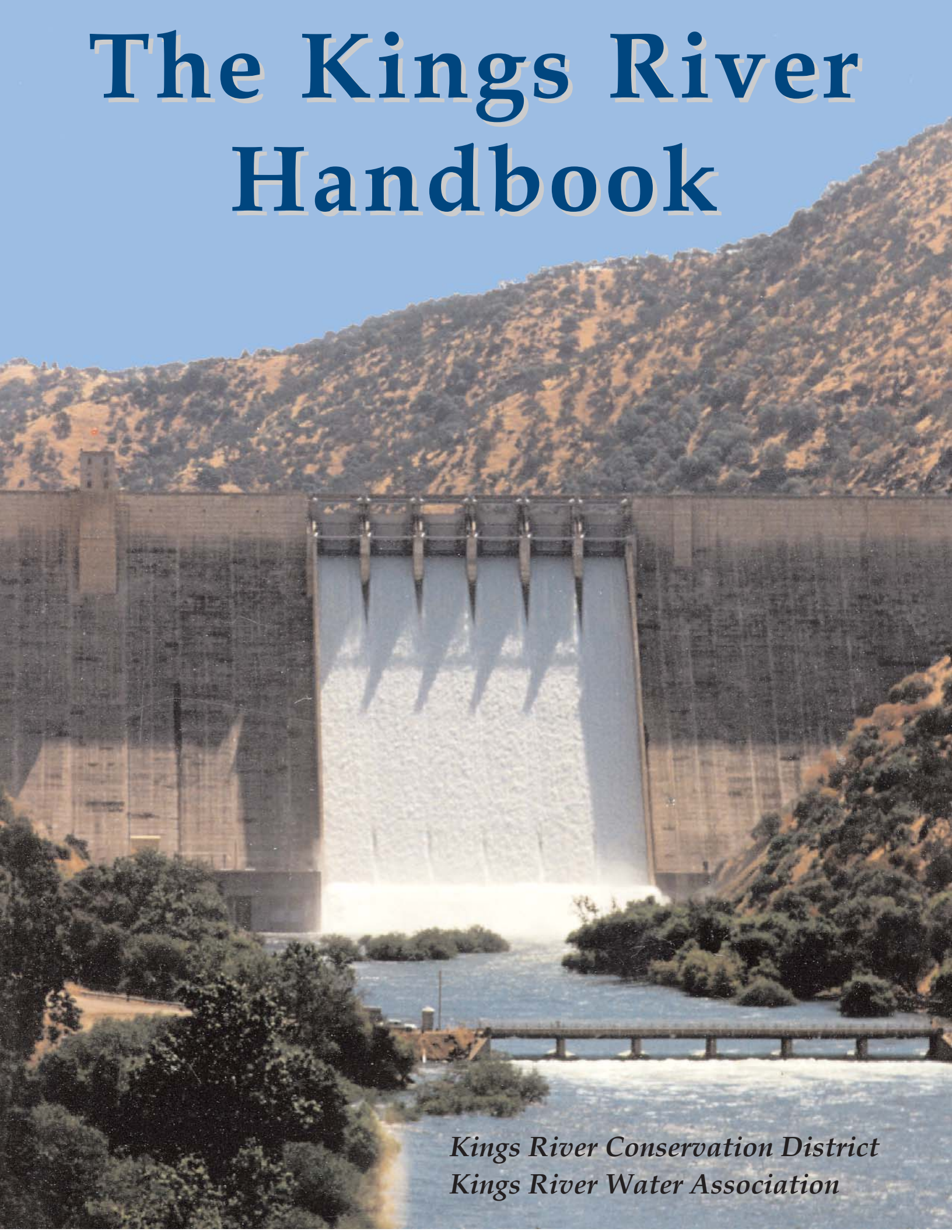
The Kings River Handbook



Kings River Conservation District
Kings River Water Association

THE KINGS RIVER HANDBOOK

KRCD
Kings River Conservation District

KRWA
KINGS RIVER WATER ASSOCIATION

JUNE 2003

Fourth Printing

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INTRODUCTION

There is nothing in the world quite like the Kings River. The magnificent mountain country in which the river begins is among Earth's most rugged and spectacular. What water from the Kings has created on the land is equally remarkable, a garden of some one million acres which today is an important part of the world's most fertile and productive agricultural region. It is a living lesson on the value of water in a land of little rain. No resource is more precious to the hundreds of thousands of people who live and work in portions of Fresno, Kings and Tulare counties watered by the Kings. The river is a stream rich in history. Its waters were often troubled but, with patience and a spirit of cooperation, Kings River users fashioned voluntary agreements on water rights entitlements and operations which benefitted everyone and made possible the development of Pine Flat Dam. Today, faced with enormous population growth and expansion of environmental values, entirely new challenges are being met on the Kings River. Among these are studies, policies, projects and facilities to enhance fish and wildlife resources, including implementation of the new Kings River Fisheries Management Program. Dealing with the issues of today and appreciating the importance of the river's beneficial uses requires understanding of what has taken place in the past and recognition of the river's varied facilities and complex operations. These pages summarize the Kings River, its rich history, beauty, environmental resources, operations, agreements, uses and incredible value. It is not a large river of commerce or transportation, but for all of us, in so many ways, the river's waters are life. This is what the Kings River is all about.

A Synopsis of Kings River History

The Kings River's rich history has had enormous impacts on the way our region has developed, resulting in a rich agricultural heritage and growing urban settings. The past's mighty struggles have ordained how the river is beneficially used today. This synopsis is not intended to be a comprehensive Kings River history. It is based upon information contained in previous Kings River historical summaries, general histories of the central San Joaquin Valley, contemporary newspaper accounts, and records of the Kings River Water Association, its 28 member units and the Kings River Conservation District.

Native Conditions and the Early Kings River

The native valley floor, unlike the splendid coastal valleys which encompassed nearly all settlement in Spanish and Mexican California, was largely monotonous, dreary and unpleasant. It appealed to few explorers and fewer would-be settlers.

Among its earliest visitors was Captain Gabriel Moraga and his straggling band of Spanish soldiers. On January 6, 1805, Moraga's party discovered a previously unknown stream flowing from the foothills onto the valley floor. The river was christened in praise of that holy day, the Feast of the Epiphany.

It was named *El Rio de los Santos Reyes* - River of the Holy Kings.

The river's divine designation did nothing to enhance first impressions of much of what would become the Kings River service area. Those who first saw the country considered it to be desert and of little or no value except for naturally watered areas along the Kings and other rivers. On the Kings' lower reaches were the wetlands of the Fresno Slough-Summit Lake country and Tulare Lake. Otherwise the plains were devoid of vegetation, except for seasonal grasses.

Lieutenant George H. Derby, a U.S. Army topographical engineer, in 1850 surveyed portions of the Kings River country and other portions of the southern San Joaquin Valley.

For the most part, Derby wrote, the land was "barren, decomposed, (with) no trace of vegetation but a few straggling artemisias. . . , scorpions, centipedes and a small but extremely poisonous rattlesnake about 18 inches long. . . which, with the gophers and ground rats, are the only denizens of this unpleasant and uninhabited spot."

It was a land without water.

The Kings River's Fluctuating Water Supply

The Kings River is burdened with a reality shared by all southern Sierra Nevada streams. The Kings is prone to extreme annual swings in runoff which directly relate to mountain precipitation. That reality, from the beginning of the Kings River country's settlement in the 1860s until the present, has been occasionally good and just as frequently bad, depending upon how much winter and spring rain and Sierra snow happen to fall.

Annual Kings River runoff averages 1,745,000 acre- feet. The river's all-time minimum runoff, however, was only 391,700 acre- feet (in 1923-24), just 23.1 percent of average.

On the other extreme, the 1982-83 water year produced record runoff of 4,476,400 acre feet, 264.5 percent of average, only to be followed by an 11-year span that included eight below-average years, including a critical 6-year drought which began in 1986-87.

Kings River runoff, such as this roaring through Cedar Grove, directly depends upon each year's Sierra snowpack.

In dry years, then as now, water supplies were insufficient to fully irrigate the nearly 1.1 million acres of highly productive farmland that is watered from the Kings. Since reservoir capacity is generally insufficient to accommodate all runoff in wet years, losses to the water-deficient service area through Kings River flood releases equate to 200,000 acre-feet per year.

Tapping the Kings River

Initial Kings River service area settlement began in the 1850s in what is now known as the Centerville Bottoms of Fresno County. The first ditches tapped into the Kings River between 1863-66 to bring water into the Centerville area. Those primitive ditches were all destroyed in an 1867 flood.

Other canals soon followed. The first of substance was a project commissioned in 1871 by A.Y. Easterby and carried out by Moses J. Church to bring Kings River water to Easterby's property (east of where Fresno was established in 1872) via Mud and Fancher creeks. Between 1872-74, the larger Fresno Canal was developed, conveying water onto an immense, previously uncultivated prairie.

The newly watered soils, rather than being agriculturally inferior, turned out to be extraordinarily fertile. They burst into lush plantings under the hot, dry, valley climate. Immense crops were produced. The worth of irrigated land was swiftly established.

Over the next 15 years, dozens of canals were constructed downstream, ultimately serving more than one million acres and making possible intense cultivation.

Thus, the Kings River service area's agricultural abundance and economic worth have as their basis the diversion and employment of surface water delivered economically by gravity.

Canals constructed over the years crisscross the valley delivering water to farms from Fresno to the Tulare Lake bed.

Water Rights and Riparian Disputes

Chaos, controversy and court fights ruled the Kings River for decades. Organization and cooperation were minimal at best and non-existent at worst. It added up to confusion that made it practically impossible for most individual irrigators to know when they would receive water or when they might be shut off by upstream users.

More serious were challenges over water rights. Practically from the beginning, pioneer users were plagued by a lack of agreement on water use and entitlements, a situation which soon deteriorated into a massive conflict caused by contradictory laws. Those who pioneered the building of the river's dozens of canal systems simply posted their water claims under the doctrine of prescriptive right. The rule, dating from the water-use custom of Mexican California, was simple: First in time; first in right.

Those earliest irrigationists soon found themselves challenged by lower river riparian landowners. California's first Legislature, recognizing that much remained to be legislated, had adopted British common law to embrace situations not covered by federal or state laws or constitutions. The riparian doctrine of common law provided that no one could cause a stream to flow with diminished quality or quantity past a given point, a stipulation which stood in clear conflict with the doctrine of prescriptive rights.

In dry years, riparian owners began demanding that the river's flow remain undiminished along their lands. In an 1888 Kern River case before the State Supreme Court, they won their case. In subsequent litigation, lower courts and the State Supreme Court ordered many Kings River canals closed.

It was not unusual for desperate, water-short farmers to arm themselves and seize headgates to keep water flowing to their land. Such water-supply uncertainty diminished land prices, demonstrating the critical significance of a secure water supply in a land of little rain.

Such conditions inevitably spawned long, complex legal battles. Litigation lasted more than 40 years and included more than 130 lawsuits.

There were a few signs of progressive change. One was the first Kings River water schedule, negotiated in 1897 by L.A. Nares. He managed the Fresno Canal and Irrigation Company and Rancho Laguna de Tache. The 1897 accord included only the most senior diverters - the Fresno company and three lower river companies in Kings County, People's Ditch Company, Last Chance Water Ditch Company and Lower Kings River Ditch (now the Lemoore Canal and Irrigation) Company.

A small entitlement was provided for the Laguna ranch, a 48,800-acre Mexican land grant (downstream from modern Kingsburg) acquired along with other lower river riparian properties by the Fresno company in 1892 to secure riparian rights then claimed by the Laguna Grant. The 1897 agreement governed only the river's lower flows, below 1,900 cubic feet per second. It was, however, a start. Dozens of lawsuits were dismissed. The agreement was also generally recognized by all of the river's other users.

Riparian appropriation issues were settled in a 1928 state election. Added was a state constitutional provision, based on the realities of existing uses, which made beneficial use the measure of all water rights, whether appropriative or riparian. It provided that riparian owners would be entitled to no more water than they actually need to serve a beneficial purpose.

The 1921 Agreement and Watermaster Kaupke

Efforts to resolve remaining differences began a long, slow process in 1913.

Users realized that the Kings River's historic contentiousness simply could not be permitted to continue into the future. More importantly, it was understood that a dam at Pine Flat, needed to harness the river, would never be possible until agreements were reached on water rights and

For many years after the 1888 riparian decision, the Kings River water carried in many canals was illegally diverted.

Charles Kaupke
Kings River Watermaster from 1919-56

entitlements. By then, nearly all Kings River flows were being put to beneficial use within the service area.

Extensive discussions on the Pine Flat question led to early recognition that an umbrella Kings River agency would ultimately be necessary. In 1916, a group of irrigation leaders known as the Committee of Thirty took as its name the Kings River Water Control and Conservation District. Its objective was implementation of state legislation - a Kings River Conservation District and Pine Flat Dam act - that had been passed in 1915. The law was twice amended but an operating conservation district did not manage to become reality.

Progress continued, however. In 1917, state irrigation district formation legislation was enacted to supplant the old Wright Act of 1887. The Alta Irrigation District, organized in 1888, was the second district formed under the Wright Act and that law's then-controversial provisions for publicly-administered deliveries of irrigation water. Alta was California's first irrigation district to actually provide water service to users.

A public approach to administering water rights, management and operations gained increasing appeal on the Kings River. Various water diversion schedules were proposed. In that spirit and buoyed by headway which had been made, Kings River users asked the California Water Commission to provide an impartial engineer to determine the river's flows, diversions, canal capacities and historical uses. All were needed before a comprehensive entitlement schedule could be prepared.

Late in 1917, Charles L. Kaupke, a state water engineer, arrived in Fresno and went to work gathering data. His efforts earned considerable respect among the river's diverse diverters. When the 1919 season turned up dry, users unanimously requested that Kaupke be assigned to act as watermaster and arbitrate diversion issues for the balance of 1919. So satisfied were users that Kaupke was again appointed watermaster in 1920.

Other engineers began assisting Kaupke in developing a trial water diversion schedule, based upon the river's mean daily flow. Mean daily natural flow at Piedra has always been at the heart of Kings River uses, regulation, stream control and storage. Kaupke's task was to resolve problems, disputes and conflicting claims by finding solutions which complemented that most basic of measurements.

Resolution became a more critical need when some lower river lawsuits were set for trial on October 1, 1921. Most Kings River diverters believed that the litigation would not only be long and costly, but would negate much of the progress on entitlements that had already been accomplished. Acting with dispatch, a committee consisting of Kaupke, water engineer J.B. Lippincott and L.A. Nares (who had negotiated the first limited water schedule in 1897) drafted an interim agreement.

On September 27, 1921, representatives of 35 agencies accounting for more than 95 percent of the total diversions and a gross area of 1 million acres signed the pact. It requested the state Division of Water Rights "to prepare a temporary schedule for the division and administration of the waters of Kings River for the calendar year 1922."

As a result, all pending water rights litigation was postponed. A watermaster (Kaupke) was appointed. His work was to be funded by $15,000 assessed on a prorated basis to the participating agencies. The first in a series of trial water entitlement schedules was ready for use in 1923. It was refined each year through 1926 and eased much of the river's turmoil.

THE 1927 AGREEMENT AND KRWA'S ESTABLISHMENT

"Year by year, the need for a permanent settlement of the water rights was becoming more apparent," Watermaster Kaupke later wrote.

Between 1923-26, a vigorous second effort was mounted to establish a conservation district legally capable of selling bonds and building a dam at Pine Flat. A Kings River Water Storage District board began meeting in 1925. As was the case in 1915-16, however, the hoped-for public agency was never permanently organized. District board deliberations did directly lead to a lasting Kings River solution.

On May 3, 1927, a voluntary agreement was reached among 19 diverters (providing water to 958,000 acres). The agreement's schedule was considerably improved from the trial schedules, reflecting hydrologic data which had been developed over the previous several years. The greatest change was development of separate schedules for each month, acknowledging significant variations in runoff and actual diversions from month to month.

May (when daily mean flows generally peaked) encompassed the maximum 1927 schedule, covering 9,450 cubic feet per second; it represented practical diversion capabilities and capacities of the units. Schedules of other months closely corresponded to records of actual diversions. The December table made allocations only on the first 1,000 cubic feet per second.

The accord established an alliance known as the Kings River Water Association. KRWA assumed all duties that had been performed from 1918-27 by the California Water Commission and the California Division of Water Rights. It

was to be administered by a watermaster, a role filled by Charles Kaupke until his retirement in 1956.

Considering the river's history of conflict, the 1927 agreement was a pivotal and remarkable accomplishment, even though it did not then include detailed schedules for either Tulare Lake bed units or the Centerville Bottoms. However, rights of those areas were recognized by the 19 original KRWA units.

THE CORPS, THE BUREAU AND KRCD

The agreement of 1927 was a turning point in Kings River history. More than any other circumstance, the settlement cleared the way for eventual construction of Pine Flat Dam.

The dam's need and actual site had been obvious as early as the 1880s. At first, water storage and conservation benefits were the appeal for dam development. That changed following disastrous 1906 flooding which focused attention on the need for flood control. Despite that concern, the project eluded two generations, largely as a result of politics and the practical problem of who would shoulder the cost. When farm prices and property values began to plunge between 1921-23, momentum on the dam project slowed.

On the Kings River, progress has never come easily or quickly. With the Pine Flat project, many false starts followed.

So did a bureaucratic tug of war between two federal agencies. It started in 1937. The Army Corps of Engineers proposed to build Pine Flat as a flood control project, dedicated to benefits on the Kings River. The Bureau of Reclamation viewed the dam and reservoir as an extension of its Central Valley Project, then in its initial development stages. President Roosevelt complicated the situation by assigning the project's development to both agencies. The two agencies each agreed - Pine Flat should be built. They differed on basic issues flood control and conservation values, storage and operations, and, perhaps most importantly, construction costs and local cost contributions. Arguments raged through four years of hearings.

Kings River water users and the Kings River Water Association sided with the Corps of Engineers. KRWA's member units, holders of the Kings' water rights, wanted no part of Reclamation law restrictions or the CVP. State water engineers who conceived the CVP (before it was taken over by the federal government in 1935) eliminated the Kings from their early planning. They recognized that the river's entire flow was lawfully and efficiently appropriated by the river's users, except for infrequent flood flows.

In December 1944, Congress approved the flood control act authorizing Pine Flat Dam to be developed by the Corps of Engineers with KRWA units to pay for the irrigation storage benefit once that amount was determined. For that task, President Truman in 1946 assigned the Bureau of Reclamation to negotiate the necessary contracts. Kings River users again fumed that Pine Flat was being classified as a Reclamation project. Talks went nowhere. Even after Pine Flat Dam's construction was started by the Corps of Engineers late in 1949, newly elected Representative Cecil F. White made an unsuccessful and highly controversial legislative attempt to fully integrate the Kings River and its valuable hydroelectric sites into the Central Valley Project.

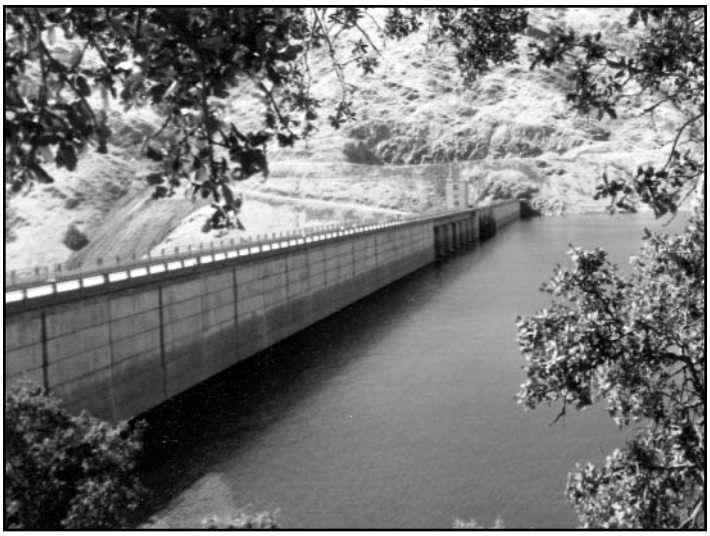
A basic operational decision, one that governs Pine Flat Project operations to this day, was made by the Corps of Engineers in January 1952:

- **Flood control.** The Corps would have complete authority.
- **Conservation storage and releases.** The Kings River watermaster would be in control.

Pine Flat Dam was completed in 1954 at a cost of $42.3 million but the often rancorous storage and repayment contract negotiating process with the Bureau of Reclamation dragged on. KRWA and its units joined the Corps of Engineers in contending that all of the new reservoir's space should be available for storage, limited only by Pine Flat's flood control purposes and priorities. Even though the Corps' 1952 administrative decision appeared to imply that the Bureau of Reclamation's role was strictly that of a negotiating agent, KRWA's units knew that Pine Flat Reservoir could not be used for irrigation storage without a Bureau agreement.

THE KRCD'S FORMATION

In 1951, the contract situation and other water rights matters helped prompt the third and ultimately successful effort to create the Kings River Conservation District as a public agency that could act for the entire Kings River serv-



The construction of Pine Flat Dam created more stable supply of irrigation water, flood control and recreation.

ice area on a variety of river-related issues and potential projects.

Aside from the ongoing Bureau of Reclamation struggle, there were sound reasons why KRCD's establishment was viewed by Kings River interests as necessary:

- **Contract Negotiations.** No overall public agency existed which was empowered to contract with the United States on behalf of all water users seeking storage rights in Pine Flat Reservoir. The Kings River Water Association, then as now, was a private organization. The Fresno Irrigation District then served as trustee for Pine Flat storage use by all river units.

- **Water Rights.** A public agency was necessary to receive filings which had been made in 1927 by the state for possible future use in what had been conceived as a state-operated Central Valley Project. The Bureau of Reclamation sought to receive the unappropriated rights. So did KRWA before the water association was told that, as a private organization, it could not be granted the rights. Kings River water users feared that the filings might be used by the Bureau of Reclamation to permanently link the Bureau and Reclamation law with the Kings River.

- **Power Development.** A regional public agency such as KRCD would be better equipped than an irrigation district to develop hydroelectric projects at Pine Flat Dam and on the North Fork. The Fresno Irrigation District, as trustee for other river units, had applied to develop those projects.

- **Conservation Improvements.** Development of groundwater recharge facilities, reclamation and drainage projects had been suggested as possible future KRCD projects.

Special legislation to create KRCD was backed by KRWA and the river's units. It was approved and signed into law on June 8, 1951. KRCD's organization was crafted to closely resemble an irrigation district but with several restrictions on its authority. It was to include most of the Kings River service area. The district board organized on November 14, 1951. KRCD voters confirmed the district's formation in a referendum on December 18, 1951.

KRCD played a vital role in the Pine Flat contract negotiations. Between 1954-63, the district acted for the river's users in contracting with the Bureau of Reclamation for a series of interim annual Pine Flat water storage contracts. Each acre foot of stored water cost local units $1.50. Over a period of nine years, $7.8 million was paid to the Bureau.

THE 1949 AND 1963 AGREEMENTS

A 1949 agreement extended the Kings River's entitlement schedule to specify details for diversion by South Fork and Tulare Lake bed units.

The new agreement increased the maximum flow allocation on the monthly schedules and provided that any flows in excess of the new maximum were to be divided, half to the main Kings River and North Fork units and half

Pine Flat Dam in 1956, two years after its completion made the Kings River dream a reality.

to the South Fork units. (Only the Centerville Bottoms area, lacking an administrative structure, was omitted but its water rights were again recognized; that territory's Kings River Water District was organized in 1952.) The 1949 agreement resulted in dismissal of the last three Kings River water rights lawsuits.

Charles L. Kaupke, the first watermaster, later wrote that the conclusion of litigation meant that "there was peace on the river for the first time in more than 80 years.... It was the largest peaceful settlement of water rights on a major river to be recorded in the history of Western irrigation". That proved to not be entirely accurate because Kings River users still faced many more years of controversial dealings with the Bureau of Reclamation. Also remaining were difficult entitlement questions related to allocation of Pine Flat Reservoir storage space, as well as issues involving downstream channel losses that resulted from storage behind the new Pine Flat Dam.

Agreements with the Bureau of Reclamation on permanent contracts were not finalized until December 23, 1963, when all 28 Kings River Water Association member units individually signed separate contracts for shares of project repayment and storage space. Users accepted responsibility for repaying $14.25 million, a third of Pine Flat's construction cost, and $750,000 to acquire Kings River water rights claimed by the Bureau of Reclamation on the Fresno Slough. The units agreed to pay for 37.4 percent of Pine Flat's operations and maintenance. Extensive efforts by the Kings River Conservation District resulted in users receiving full credit for $7.2 million in interim contract payments toward their repayment obligation. KRWA assumed the duty of handling repayment accountability, as well as overseeing water entitlements and deliveries and administering storage rights for member units.

At the same time, a new master Kings River agreement was approved. The units agreed among themselves on how

the river should be operated under storage conditions, including channel losses. Maximum-flow limits on the monthly water schedules were eliminated.

While each Kings River water rights accord represented important progress, the 1963 agreements were most meaningful for finally putting to rest vexing entitlement issues. The Pine Flat storage and repayment contracts gave the people of the Kings River service area exclusive and perpetual rights to 1,006,500 acre-feet of Pine Flat Reservoir's storage space (except for the project's flood control requirements). Because of the 1963 Kings River agreement and the issues it resolved, peace finally came to the Kings, nearly a century after the river's beneficial development began.

Full Appropriation of Kings River Water

Formalizing the Kings' water rights, like so many other parts of the river's puzzle, required many years to accomplish.

Acting independently of one another, Kings River water users began filing a total of nine applications to appropriate Kings River water not long after what was then known as the State Water Rights Board (now the Water Resources Control Board) was established in 1914. In time, more than 100 protests were filed against these applications.

As a result of the 1963 intra-association agreement, the Kings River applications were consolidated by a trust agreement on September 16, 1964. The Fresno Irrigation District acted as trustee on behalf of all KRWA members.

The application was considered by the State Water Rights Board during 15 days of hearings between April 4 and July 20, 1967. The result, on November 30, 1967, was Decision No. 1290. It issued six water rights permits, which included storage in Pine Flat Reservoir, Lake Wishon, Courtright Lake and Tulare Lake along with virtually all Kings River water. The Water Resources Control Board declared on November 16, 1969, that the Kings River's waters were fully appropriated.

On May 18, 1984, one hundred twenty years after Kings River diversions began, water rights licenses were issued. KRWA became the trustee in the spring of 1988.

The Kings River Reclamation Law Dispute

For KRWA and its member units, Pine Flat Dam's completion and eventual progress on storage agreements did not mean an end to difficulties with the Bureau of Reclamation.

The Kings River Water Association contended that Pine Flat Dam's primary purpose had always been flood control. From an irrigation standpoint, the dam did little to increase the water supply in most years. Its principal benefit, aside from flood control, was in regulating well established, privately held rights, making possible the use of water when it was most needed for spring and summer irrigation. No longer was it necessary for KRWA's units to rely on the "run of the river" to divert their water entitlements.

Patient cooperation and progress finally brought peace to the river's once troubled waters.

Issues arose over whether or not federal Reclamation law should apply to the Pine Flat project and, if so, whether or not repayment of project costs allocated to irrigation benefits would terminate Reclamation law acreage limitations.

A 1961 Interior Department legal opinion reversed the United States' long standing policy and administrative practice that had relieved Kings River landowners of Reclamation law acreage limitations after their local agency's Pine Flat Project repayment obligations had been met.

Imposition of Reclamation law angered Kings River units and users. Essentially all Kings River service area lands were developed and ownership patterns were established long before Pine Flat Dam was developed. Except for the Tulare Lake bed, where the constant threat of severe flooding makes small-scale farming economically infeasible, farming in nearly all of the Kings River service area has always been on small parcels.

The Bureau of Reclamation rejected then-pending contracts with KRWA members but agreed to a test case of issues.

In 1972, a U.S. district court ruled:

- Reclamation law did not apply to the Pine Flat project.
- Even had Reclamation law applied, it would have been terminated by repayment of irrigation storage costs.

A federal appeals court reversed the decision, however, and in 1977 the Supreme Court declined to hear the case.

The issue was finally decided by Congress in the 1982 Reclamation Reform Act. That measure specifically

exempted the Kings River and other Corps of Engineers flood control projects (such as Terminus and Success dams on the Kaweah and Tule rivers) from acreage limitation restrictions and other provisions of Reclamation law.

Flood Protection and Power Generation

The Kings River Conservation District in 1959 became the lead agency in downstream channel and levee improvement projects. Those were directed at protecting flood-prone lands in Kings and western Fresno counties as well as improving the river's capability of carrying flood releases from Pine Flat Dam or uncontrolled flood flows from Mill and Hughes creeks. Work continued for the next 16 years. Improved channel capacity preserved the amount of conservation storage space available in Pine Flat Reservoir.

Additional storage and power generation facilities became Kings River goals at an early date.

When Kings Canyon National Park was created in 1940, its boundaries were drawn to exclude two potential reservoir sites, in Cedar Grove on the South Fork and remote Tehipite Valley on the Middle Fork. Those sites were annexed into Kings Canyon National Park in 1965 and removed from development consideration.

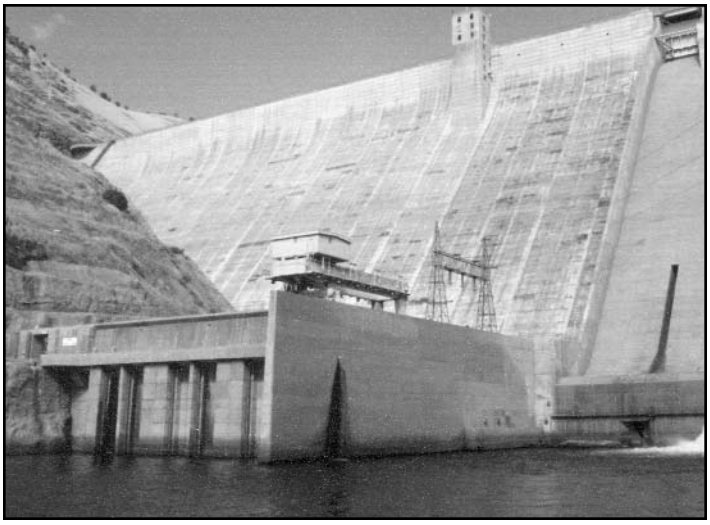
A KRCD master plan, adopted in the early 1970s, proposed development of a Pine Flat Dam power plant, a Piedra afterbay reservoir (to re-regulate flows), a Dinkey Creek reservoir (with two power plants), raising Pine Flat Dam, a dam and power plant at Rodgers Crossing (above Pine Flat), and a dam on Mill Creek (upstream from its confluence with the Kings River, below Pine Flat).

Only the Pine Flat Power Plant has been developed. It was completed in 1984. KRCD sells the electricity generated at Pine Flat to the California Department of Water Resources for powering State Water Project pumping facilities. The plant uses only irrigation and flood control water releases from Pine Flat Dam to generate electricity.

KRCD's Dinkey Creek project moved to within two months of the start of construction in 1986 when plans were halted for lack of a purchaser for energy the project would generate. That failure resulted from delays caused by environmental litigation challenging parts of the Dinkey Creek plan.

The Rodgers Crossing project was studied on several occasions beginning in 1972. Creation by Congress (through passage of the Forest System Act in 1987) of a special upper Kings River federal management area between the elevations of 995 and 1,590 feet put the Rodgers Crossing project into dormancy. An act of Congress would now be required for the dam's development.

The North Fork's potential for hydroelectric power development was recognized in the 20th century's earliest years. San Joaquin Light and Power Corporation in 1927 developed the Balch Powerhouse, a stream-flow generating plant, along with diminutive Black Rock Reservoir.



KRCD's Pine Flat Power Plant, completed in 1984, was the first Kings River master plan project to be completed.

More than 25 years of dispute between Pacific Gas and Electric Company (SJL&P's successor), the Bureau of Reclamation and Kings River interests (represented by the Fresno Irrigation District) delayed further North Fork power development.

Work began on PG&E's Kings River project in 1955. Built were Courtright Lake, Lake Wishon, Haas Powerhouse (first underground power plant in the United States), the Kings River Powerhouse at the upper end of Pine Flat Reservoir and other facilities, including enlargement of Balch Powerhouse. In 1984, the PG&E Helms Pumped Storage Project and its underground generating-pumping facility between Lake Wishon and Courtright Lake were completed.

Two small off-stream reservoirs near the General Grant Grove section of Kings Canyon National Park are remnants from the Kings watershed's logging history. Sequoia Lake on Mill Flat Creek was developed in 1889 and Hume Lake on Tenmile Creek was created in 1909 to supply water for a flume that transported roughly milled timber to a mill in Sanger. Hume Lake Dam, designed by pioneer engineer John S. Eastwood (who conceived of the Big Creek hydroelectric project on the San Joaquin River), was the world's first multiple-arch dam. Although still used for recreation, neither reservoir plays any role in modern Kings River operations.

Care for Fish and Wildlife

Helping care for the Kings River's fishery is a responsibility and trust that the Kings River Conservation District and Kings River Water Association accepted long ago and have pursued ever since. Today, this important environmental obligation has grown into a variety of scientific studies and monitoring. These activities are taking place largely under a model and entirely voluntary, cooperative

and consensus-based effort, the Kings River Fisheries Management Program.

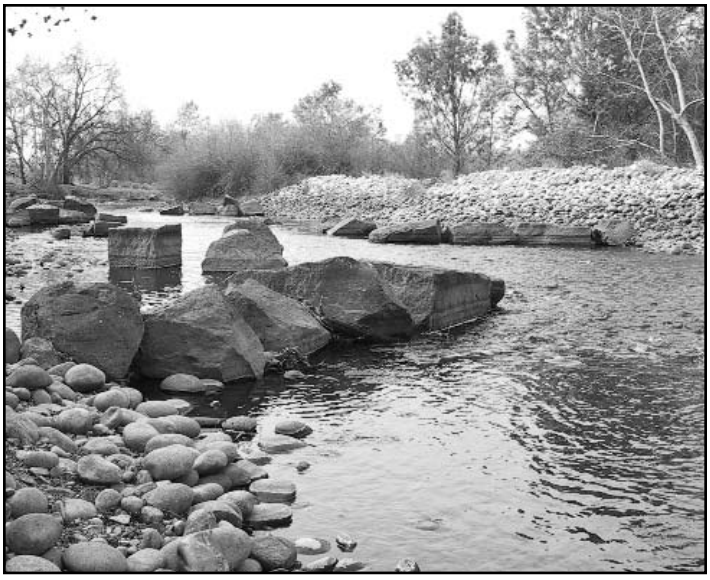
KRWA became involved in river fishery issues in the 1950s, following completion of Pine Flat Dam. The KRWA, its member units and the California Department of Fish and Game (CDFG) recognized that the new barrier affected the river's habitat below the dam.

On September 11, 1964, KRWA and the CDFG entered into a comprehensive fish and game accord. The agencies agreed to preserve, protect, maintain and enhance fish and wildlife resources then existing in and adjacent to the river below Pine Flat. Perhaps most importantly, KRWA's units voluntarily agreed to provide a minimum flow of 50-100 cubic feet per second (c.f.s.). at the head of the Centerville Bottoms, depending upon the type of current year water conditions and the previous water year's total runoff. The agreement permitted releases to be limited to 25 c.f.s. for the short stretch of river between the dam and the river's confluence with Mill Creek if the latter stream was contributing sufficient flows. For the next 35 years, this agreement governed operations during periods in which there were no irrigation release demands from units or flood release operations by the Corps of Engineers.

In 1991, a public trust complaint was filed by a number of anglers and others interested in the river. It alleged the Pine Flat Project's operation had harmed the "public trust" in connection with the reservoir habitat and that within the river below the dam. A number of "remedies" were proposed, including establishment of a large minimum pool in Pine Flat Reservoir and much greater minimum river releases. Kings River interests responded by beginning a lengthy process of reaching out to anglers and the CDFG in search of ways to create genuine habitat improvements without harming water users.

KRCD, supported by KRWA, had already undertaken many environmental studies and programs. Those were accelerated during the 1990s. During that same period, the CDFG commissioned and conducted studies of its own. In 1993, the U.S. Army Corps of Engineers launched fish and wildlife studies directed at mitigating effects created by development of Pine Flat Dam and Reservoir. Congress directed that the Corps examine a variety of potential projects but that no action could interfere with water rights, storage rights or operations.

In 1993-94, a Corps reconnaissance study identified possible projects for a full feasibility study. KRCD agreed in 1995 to serve as local cost- sharing sponsor. KRWA agreed to pay half the local share. In 2001, the Corps determined there would be a federal interest in a pair of projects. The most ambitious would be a multi-level intake structure on Pine Flat Dam's upstream face to control the temperature of water being released to the river through penstocks that supply KRCD's Pine Flat Power Plant. A second project would include improving and restoring habitat along a river reach near Byrd Slough, a few miles northeast of Centerville.



Placing boulders in the river to provide habitat for fish is one of the projects identified in the Fisheries Management Program.

Another Corps of Engineers temperature control project sponsored locally by KRCD (with backing by the KRWA) is a turbine bypass system constructed between 2000-03. This project, at the base of Pine Flat Dam, was identified during the earlier Corps study. Its development was hurried as a "project modification" by the Corps in order to get its benefits in place and in use as quickly as possible. The turbine bypass permits water to be released through the penstocks, for fishery temperature control purposes, at times when KRCD's Pine Flat Power Plant is not in operation. Such temperature management flexibility is a great benefit to the downstream fishery at times of low flows. The project cost approximately $6 million.

While the Corps studies were progressing, environmental work and negotiations on long-term solutions were pursued by KRWA, KRCD and the CDFG. Progress on these efforts began accelerating as the 1990s neared an end.

Most significant were the talks that led, during the spring of 1999, to a series of agreements establishing the Kings River Fisheries Management Program. This novel partnership was voluntarily and cooperatively formed by the KRCD, KRWA and CDFG. The necessary agreements, which also included operational changes in upstream reservoirs owned by Pacific Gas and Electric Company, were signed May 28, 1999. Within the KRWA, the 28 member units agreed unanimously on terms of an agreement to implement the program.

The new program included many important aspects but among the most visible were enhanced minimum release requirements, to nearly 100 cfs at Fresno Weir, nine miles downstream from the dam. Another involved establishment of a 100,000 acre-foot Pine Flat Reservoir temperature control pool. This was accomplished by KRWA member units voluntarily making available 12 percent of their

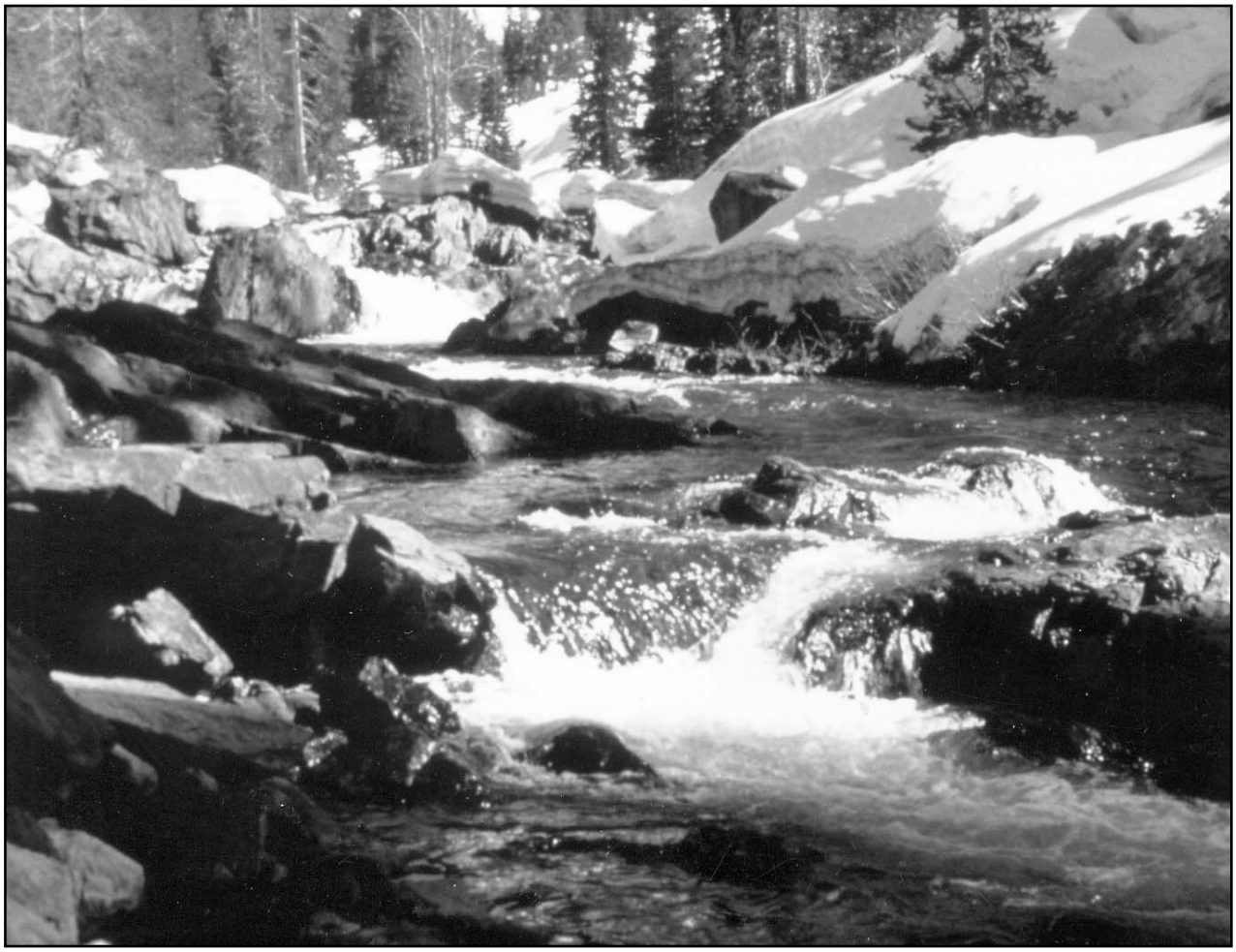
shares of reservoir storage as well as contributing other water resources and assets, including funding. Physical improvements, program monitoring, increased stream gaging and additional fish planting and angling enforcement were also part of the program. The 1964 agreement between the CDFG and KRWA, adopted to establish minimum river flow requirements below Pine Flat Dam was replaced.

The Framework Agreement defined the Kings River Fisheries Management Program as "an enhancement program that will, among other benefits, extend trout habitat suitability throughout the year in most years, and for longer periods in every year than existed historically." The program included many multi-species aquatic resource goals but recognized and protected historic water rights and beneficial uses. Along with an Executive Policy Committee and Technical Steering Committee composed of representatives from each sponsoring agency, the program relies heavily on strong public involvement through its Public Advisory Group. KRWA, KRCD, the CDFG and the public are working together, putting the program to work in what has been applauded as a major achievement.

KRCD took the lead in developing the Fisheries Management Program's first project, the Thorburn Spawning Channel. An existing but overgrown side channel was modified to include a headgate as well as restoration of oak woodland and riparian environment. Gravel, rock and other natural debris were placed within the channel to create habitat and hiding places for juvenile fish. The project's initial development was completed in 2000.

The Thorburn Spawning Channel was designed to mimic a meandering channel in nature.

Along The Kings River



The Kings River rises in the highest Sierra ranges of Fresno and Tulare counties. It flows through scenic canyons before being tamed by a great reservoir. Its waters are put to work in the generation of hydroelectric power and in irrigating a million of the Earth's most fertile acres. A rapidly growing population relies heavily upon the Kings River's resources for groundwater which the entire service area uses for domestic purposes. Its neighbors respect the river's unpredictable nature and its ability to be transformed from friend to foe with powerful floodwaters that are not always easily tamed. Its anglers delight in matching wits with fish that call the Kings River home. The Kings' passage from mountains to valley is surprisingly involved. Many important locations, structures and facilities, in an environment of much beauty, are to be found along its course.

IN THE HIGH SIERRA

HEADWATERS

The Kings River's beginnings are near the Sierra Nevada crest, within Kings Canyon National Park in easternmost Fresno and Tulare counties. Towering granite peaks with elevations of more than 13,000 feet surround and help supply all three Kings River forks.

South Fork. The best known branch because of its accessibility, its course begins in Upper Basin at an elevation of 11,800 feet, just below 12,740-foot Mather Pass (27 miles east of Lake Wishon). The South Fork tumbles through Paradise Valley before turning west to flow through beautiful **Kings Canyon**. Its descent is abrupt. Cedar Grove, 28 miles from the headwaters, is 7,100 feet lower in elevation than Upper Basin. Supporting the South Fork are important tributaries such as Woods Creek, Bubbs Creek and Roaring River.

Middle Fork. The most secluded and seldom visited fork, its course is nearly completely within designated wilderness. It originates in Helen Lake (elevation 11,595 feet), immediately below Muir Pass and 17 miles east of Courtright Lake. After flowing a few miles toward the east, the Middle Fork arcs into the grand, lonely depths of **Tehipite Valley**, 27 miles distant and 7,400 feet lower.

North Fork. Although shorter and smaller, its waters are the hardest working, having been harnessed by Pacific Gas and Electric Company to generate clean hydroelectric power. The North Fork rises in 10,803-foot-high Ambition Lake, flanking the LeConte Divide. Sixteen miles and 4,300 feet in elevation downstream, the North Fork reaches **Lake Wishon** and the PG&E system. Major tributaries are Helms and Dinkey creeks.

PG&E POWER PLANTS

An extensive hydroelectric generation system, developed as three distinct projects by Pacific Gas and Electric Company, stretches along the North Fork. PG&E's **Courtright Lake** (elevation 8,144 feet) on Helms Creek, with a capacity of 123,300 acre-feet, is the uppermost Kings River system reservoir. Three miles downstream is **Lake Wishon**, with a capacity of 128,400 acre-feet. Both reservoirs were completed in 1958. Between, connected by tunnel, is the big **Helms Pumped Storage Project** underground powerhouse, completed in the early 1980s; its pumping capability permits water to be reused for additional hydroelectric generation. Water from Lake Wishon is tunneled to **Haas Powerhouse**, the nation's first underground power plant when it was completed in 1958. At tiny **Black Rock Reservoir** (at an elevation of 4,500 feet) water flows into another tunnel leading to **Balch Powerhouse** at Balch Camp (established in 1927 originally as a stream flow plant). From a small afterbay at Balch Camp, water is conveyed by tunnel to PG&E's **Kings River Powerhouse** which, at an elevation of 1,000 feet, discharges directly into Pine Flat Reservoir.

Mount Goddard, near which the Kings River's North and Middle forks begin their journey to the thirsty San Joaquin Valley.

UNDEVELOPED RESERVOIR SITES

At various times, other Kings River reservoirs and power projects have been proposed. Reservoir sites on the Middle Fork (in **Tehipite Valley**) and South Fork (at **Cedar Grove**), which the new Kings Canyon National Park acknowledged and avoided when its boundaries were drawn in 1940, were annexed to the park in 1965 and removed from development consideration. A site at **"The Junction"** of the Middle and South forks was found to be impractical. **Rodgers Crossing**, on the mainstem Kings River in foothill country above the confluence with the North Fork, had long been recognized and studied as a major reservoir site. In 1985, the Kings River Conservation District began a feasibility study.

The proposal generated substantial controversy over environmental issues. In April 1987, Congress (in the Forest System Act) approved a compromise plan to create a special federal management area between the elevations of 995 and 1,590 feet. The law permits studies to be conducted but an act of Congress would be required before there could be any reservoir development within the management area.

Another Kings River Conservation District upper-river project, including a reservoir and two power plants on **Dinkey Creek** above Balch Camp, nearly became reality during the same period. Plans were halted within two months of the scheduled start of construction in 1986. Attempts to negotiate a power-sale agreement were unsuccessful because of delays caused by lengthy environmental litigation challenging various plan aspects.

Two potential low-elevation reservoirs - an off stream site on Mill Creek in Wonder Valley (southwest of Pine Flat Dam) and the Piedra Afterbay - have never been developed.

Wild and Scenic River

The mainstem Kings River and South and Middle forks are federally designated as a wild and scenic river above the elevation of 1,590 feet.

Pine Flat Dam and Reservoir

Project Origins

Need for a large dam and reservoir at **Pine Flat**, in the Sierra Nevada foothills 23 miles east of Fresno, for flood control and beneficial water conservation storage was recognized in the early 1880s. Decades of preliminaries were required. **Pine Flat Dam** was authorized as a part of the 1944 Flood Control Act. Ground was broken in 1947. The dam, an Army Corps of Engineers flood control project with compatible water conservation benefits, was completed in 1954.

Pine Flat Dam

An impressive concrete structure, it spans a narrow canyon a few miles above the Fresno County foothill community of Piedra. (*Please see map, Page 38.*) The dam stands 429 feet in height and, at its crest, is 1,820 feet in width. Its construction cost $42.3 million, of which Kings River users were assessed $14.25 million (most of which has been repaid) for the 37 percent of the project determined to be Pine Flat's storage conservation benefit. The dam is operated by the **Army Corps of Engineers**.

Pine Flat Reservoir

The lake impounded by **Pine Flat Dam** is the largest reservoir on any southern Sierra stream. The one million acre-foot reservoir, when full, covers 6,000 acres and stretches 20 miles into the oak-forested foothills with 67 miles of shoreline. Its gross pool elevation is 951.5 feet above sea level.

Temperature Control Pool

Under the new **Kings River Fisheries Management Program**, KRWA's member units have modified operations to maintain Pine Flat Reservoir storage of not less than 100,000 acre-feet, subject to conditions beyond reasonable control of the KRWA and its members. This will help maintain a pool of cool water for use in reservoir and downstream fisheries under many, although possibly not all, critically dry conditions. Pine Flat Reservoir previously had no minimum storage requirement. KRWA member units voluntarily made available approximately 12 percent of their storage rights. That storage is to provide water for the temperature control pool as well as specified amounts of water Pacific Gas and Electric Company will be entitled to hold upstream in Lake Wishon and Courtright Lake under certain circumstances. The PG&E agreement and the upstream water release modifications it required were necessary to be able to create and protect Pine Flat Reservoir's temperature control pool.

Pine Flat Reservoir is popular with boaters.

Outdoors Activities

The Pine Flat project created substantial outdoors activities and fishery benefits (but without cost allocations for those benefits). Pine Flat Reservoir and the foothill region provide extensive recreational opportunities. Fisheries in the reservoir and upper river are well known. The lake is popular with boaters and water skiers. White water rafters enjoy the river above Pine Flat. Nature lovers value the foothill flora and fauna which thrive around Pine Flat. Six campgrounds are available and picnic sites may be found above the reservoir and along the river below the dam.

KRCD's Power Plant

The **Pine Flat Power Plant**, completed in 1984, is located at the dam's base. It is owned and operated by the **Kings River Conservation District**. The plant's three units each have an installed capacity of 55 megawatts but generate only when water is released to meet irrigation demands or flood release requirements. No generation is possible when Pine Flat Reservoir storage is less than approximately 100,000 acre-feet. The plant's average annual energy output is 418 million kilowatt hours. All Pine Flat energy is purchased from KRCD by the California Department of Water

Resources for use in powering the State Water Project's pumps.

Water Entitlements

The river's water is apportioned, reservoir storage is administered and diversions are administered by a **watermaster** who manages the **Kings River Water Association** (KRWA) for KRWA's 28 member agencies under a series of complex agreements and water schedules. Kings River Water Association members have contracted for 1,006,500 acre-feet of Pine Flat Reservoir storage space. The watermaster's staff manages Pine Flat Dam water releases and deliveries to KRWA units' respective points of diversion. Flood releases are directed by the **Army Corps of Engineers.**

Flood Flows

Before Pine Flat Dam was developed, flooding was always a threat. The Kings is prone to two types of flooding. Downpours of rain over the foothills and mountains can create extremely high peak flows but generally of brief duration. The maximum natural flow ever measured or calculated on the Kings River occurred January 23, 1997 and amounted to 112,000 cubic feet per second. This flow was only exceeded by an 1867 flood which, based upon recollections and records of valley pioneers, apparently surpassed any event which has occurred since in both volume and peak flow.

Snowmelt runoff flows in the April-through-July period do not reach such extreme peaks but yield a much greater total volume of water over a longer period. Pine Flat Dam has largely controlled flood flows originating above the reservoir. However, extraordinary snowmelt years (like 1969 and 1983) require a concentrated and coordinated effort to dispose of large volumes of water while minimizing flood damage potential along lower river channels and in the Tulare Lake bed area. Flood releases are determined by the Army Corps of Engineers.

The River: Pine Flat to Freeway 99

Fishing and Recreation

The nearly 30 pleasing miles of the Kings River from Pine Flat Dam to just below Freeway 99 near Kingsburg are favorites with many recreation and outdoors enthusiasts. Along the river in the Piedra area are Fresno County's **Choinumini** and **Winton parks**. Anglers relish the convenient foothill reaches. Between Kings Canyon Road (State Route 180) and the Olsen Avenue bridge in Reedley, tubing and canoeing are popular summer river pastimes.

Reedley Beach and other beaches at resorts which line the river provide opportunities for swimming (although the river's often swift and cold waters are treacherous). In the eight miles between Reedley and Kingsburg when the river's flow is sufficiently high, boating and water skiing are enjoyed, activities possible on no other southern San Joaquin Valley stream.

River Below Pine Flat Dam

Below Pine Flat Dam and downstream from the confluences with **Mill** and **Hughes creeks**, the **Kings River** carries the entire release from the dam as well as the creeks' uncontrolled flows. The channel's capacity between the dam and the area around Kings Canyon Road (State Route 180) is listed by the Corps of Engineers as 50,000 cubic feet per second. From that point to People's Weir (south of Kingsburg), the channel's listed capacity is 13,000 c.f.s.

Minimum Fishery Releases

Since the **Kings River Fisheries Management Program** became effective on May 22, 1999, **minimum releases** from Pine Flat Dam have been nearly double the previously required (in most years) minimum flows. KRWA members now provide enhanced minimum flows of at least 100 cubic feet per second at Piedra. These enhanced flows, typically in late summer and fall months, help maintain water temperatures and habitat from Pine Flat Dam to Fresno Weir (about nine river miles downstream) that are suitable for trout. Flows of between 35-45 c.f.s. (depending upon the time of year) over Fresno Weir and into the lower river are now required. A minimum flow of 5 c.f.s. is to be required at all times in Dennis Cut, a small channel that leaves the river on its left (south) bank near Avocado Lake. Beginning in October 2005, further flow enhancements are to be made in water years with runoff of more than 1,550,000 acre-feet. (It has been recognized that achieving these future flow enhancements will require programs to provide additional water in a manner that avoids unacceptable impacts to beneficial water uses or injury to Kings River water users.) From 1964-98, minimum releases were governed by an agreement between the KRWA and CDFG that required minimum flows of 50-100 c.f.s. (depending upon the previous water year) at the head of the Centerville Bottoms.

Mill and Hughes Creeks

These important tributaries enter the Kings between one and three miles below Pine Flat Dam. Their flows, normally insignificant, are uncontrolled. In the heaviest storms, these streams are capable of generating substantial peak flows of usually brief duration. In extreme cases, flow volumes can total many thousands of cubic feet per second. A gaging station is located on **Mill Creek** just upstream from the Kings River. **Hughes Creek** contributes an amount equal to 12 percent of the flows generated by Mill Creek. The watermaster apportions the creeks' flows based on the river's water schedule. Some Kings River units gladly accept their shares of water from Mill and Hughes creeks

to help recharge the valley's groundwater reservoir. Flow remaining in the lower river also percolates into the water table.

Cobbles Weir

Midway between Piedra and the river's emergence onto the valley floor, **Cobbles Weir** is the Kings' first diversion structure. At the weir, water can be directed through **Cobbles Gate** into the **'76 Channel** (off the river's left bank), which is operated by the **Alta Irrigation District**. The channel conveys water four miles to the **Alta headgate** at Frankwood Avenue near Minkler, the Alta Irrigation District's actual point of diversion. When the Alta system is not operating, flows are usually not permitted in the '76 Channel.

Dennis Cut and Byrd Slough

Water conveyed in **Dennis Cut**, a small channel which leaves the main river near **Avocado Lake**, also reaches the Alta headgate. It serves various points of diversion within the **Kings River Water Distric**t, including water released on a year-round basis back toward the river through the **Alta Wasteway** (just upstream from the Alta headgate) and **Byrd Slough** through the **Centerville Bottoms**.

Avocado Lake

Along the left bank, **Avocado Lake** occupies a former gravel pit which supplied material during Pine Flat Dam's construction. It is now a Fresno County park.

Gould Weir

First of two Fresno Irrigation District diversion points (both on the right bank), **Gould Weir** pools water for diversion into the **Gould Canal**. The structure is located two miles below Cobbles Weir and a mile above the Friant-Kern Canal.

Fresno Weir

Three miles northeast of Centerville, a low-profile structure known as **Fresno Weir** pools water for diversion off the river's right bank into the **Fresno Irrigation District's Fresno Canal** and through the **Consolidated Irrigation District's** headgate. The **Consolidated Canal**, with a capacity of 2,000 cubic feet per second, is the Kings River's largest single point of diversion.

Immediately upstream, the federal **Central Valley Project's Friant-Kern Canal** crosses under the Kings River through a 3,200-foot siphon as it delivers San Joaquin River water along the valley's east side. A control structure and channel permit Friant water to be delivered at Fresno Weir to the CVP's only long-term Kings River service area contractors, the Fresno Irrigation District and the City of Fresno, or any temporary Kings River service area users of Friant water.

Cobbles Weir is the first structure below Pine Flat Dam to pool water for diversion.

Centerville Bottoms

Located east and northeast of Sanger, this rich and beautiful delta contains many wooded areas and complex, secluded sloughs which, supplied by the Kings, ultimately flow back into the main stream. The area is served by the **Kings River Water District's** many small channels which utilize 17 diversion points. At the lower end of the Centerville Bottoms are the **Reedley Narrows** (near the Adams Avenue alignment), a reach in which the river is constrained by bluffs. There are no KRWA points of diversion from above the Reedley Narrows to State Route 99 near Kingsburg.

Pioneer Settlement Sites

Centerville (on Highway 180, 15 miles east of Fresno) was founded on high ground in 1867 after the pioneer town of **Scottsburg**, established in 1853 a mile to the southeast, was washed away by floods in 1861 and 1867. Eight miles downstream and below the modern alignment of Adams Avenue was **Poole's Ferry**. It was operated from 1852-55. At the site of today's Olsen Avenue in Reedley was **Smith's Ferry**. The ferry was operated from 1855-74 along with a hotel.

Reedley

The only city through which the Kings River flows, **Reedley** is in southeastern Fresno County. A number of attractive residential, resort, park and recreation areas (including **Reedley Beach** and **Cricket Hollow Park**) adjoin the river, as does the campus of **Reedley College**. Two miles below Reedley (at the Nebraska Avenue-Avenue 424 alignment), the river crosses from **Fresno County** into **Tulare County**.

Freeway 99 to Army and Island Weirs

People's Weir and Pool

Largest of all such Kings River structures, **People's Weir** spans the main channel a mile south of the Fresno County community of **Kingsburg** just inside the northeastern corner of Kings County. Created is a large pool from which water may be diverted into the **Lakelands Canal**, which flows from the left bank 25 miles to the Corcoran area, or into the **People's Ditch**. Those privately operated canals deliver water to users in a substantial portion of eastern Kings County, all the way to the Tulare Lake bed. The weir is the river's lower limit of boating and water skiing. Its pool extends about three miles upstream to just above the Avenue 400 (State Route 201) bridge. Along with creating a popular water recreation area, the pool aids KRWA in managing lower river deliveries.

Old River

The original Kings River channel makes an abrupt turn toward the south a few hundred feet below **People's Weir**. In 1867, what is believed to have been the greatest Kings River flood since settlement of the region began deepened an entirely new channel that had been carved during an 1861 flood. The river itself eventually caused a natural plug to form across the original channel, now known as the **Old River**. Except at times of exceptionally high flows, it has since remained dry. Under a 1967 California Water Rights Board decision, an Old River headgate was constructed on the People's Canal two miles south of People's Weir. The old channel, now operated by the **Kings County Water District**, receives water for groundwater recharge purposes in good water supply years. The channel meanders around Burris Park and through northeastern Kings County before reaching its confluence with Dutch John Cut below State Route 43. The Kings County Water District is in the process of developing a water bank facility at the upper end of the Old River near People's Weir.

Cole Slough

Created during the 1861 and 1867 floods, **Cole Slough** is the river's main course below People's Weir and through northeastern Kings County. There are no KRWA points of diversion between People's Weir and just upstream from Laton. The combined capacity of Cole Slough, the Old River and main Kings River channels between People's Weir and Laton is listed by the Corps of Engineers as 11,000 cubic feet per second.

Dutch John Weir and Cut

The main (**Cole Slough**) channel divides one mile above Tenth Avenue (State Route 43). Downstream water demands and operational factors determine which way water will be directed. **Dutch John Weir** controls flows into

People's Weir is the largest weir on the Kings River system.

Dutch John Cut, the southerly and larger channel which joins the **Old River** just below State Route 43 to become the **main Kings River**.

Cole Slough Weir

Cole Slough Weir is located a few hundred feet from **Dutch John Weir** above State Route 43. It controls river flows into the westerly extension of **Cole Slough** toward the Laton area.

Last Chance Weir

On the main Kings River's left bank next to the Kings Country Club near **Laton**, **Last Chance Weir** pools water for diversion into the **Last Chance Water Ditch Company's** canal which serves portions of Kings County. For several miles below Last Chance Weir, the Kings River serves as the boundary between **Kings** and **Fresno counties**.

Reynolds Weir

Spanning **Cole Slough** on the eastern edge of Laton, **Reynolds Weir** controls diversions into the **Laguna Irrigation District's Grant Canal** and **A Canal**, as well as **Murphy Slough** and **Liberty Canal** which supply the **Riverdale Irrigation District**, **Reed Ditch Company** and **Liberty Mill Race Company** (all of which are members of the **Murphy Slough Association**), the **Burrel Ditch Company** and **Liberty Canal Company**. Lands watered by these various canals stretch from Laton to south, west and northwest of Riverdale in parts of Fresno and Kings counties. Water may also flow from Reynolds Weir back into the main Kings River below Last Chance Weir through a small channel, **Reynolds Cut**, on Laton's eastern edge.

Recreation

Summertime swimming, tubing and canoeing are popular water sports activities in northern Kings County, although the cold and often swift water is deceptively dan-

gerous. Near Laton, the **Laton-Kingston Regional Park** in Fresno and Kings counties offers beaches, play areas and picnicking.

KINGSTON

Located on the left (south) bank one half mile below Laton, now-vanished **Kingston** was an important early-day river town. Originally known as **Whitmore's Ferry**, Kingston took its name about 1858 when the site became the first point on the Kings River to be bridged. A few years later, Kingston became a Butterfield Stage station. The town declined rapidly in the 1870s and ultimately vanished. Kings County's portion of the **Laton-Kingston Regional Park** now marks the site, a registered state historical landmark.

THE LAGUNA GRANT

Stretching 26 miles along the original Kings River channel's right bank (below the modern site of Kingsburg) was ***Rancho Laguna de Tache***, a 48,800-acre Mexican land grant. The grant was made in 1846 to Manuel Castro by Don Pio Pico, last Mexican governor of California. The *Laguna* Grant's ownership was incredibly complicated. However, the ranch played a pivotal role in the eventual settlement of Kings River water rights and entitlements through its 1892 purchase by the Fresno Canal and Irrigation Company under which the Fresno company secured and gained control of the Grant's riparian water claims. In 1897, the manager of the Fresno canal system and the *Laguna* ranch, **L.A. Nares**, negotiated the first partial Kings River water entitlement schedules. Although incomplete, those efforts set the stage for broader negotiations which ultimately led to agreements in 1927, 1949 and 1963 which resolved all Kings River water rights and entitlement issues. **The Kings River Water Association**, which administers the river's entitlements, was established under the agreement of 1927.

LEMOORE WEIR

Three miles downstream from Laton is **Lemoore Weir** where the **Lemoore Canal and Irrigation Company** makes its diversion to serve much of the **Lemoore** area in Kings County. The Lemoore headgate is also the primary point of diversion for the **John Heinlen Mutual Water Company** which serves a smaller area north and northwest of Lemoore.

KRCD maintains lower river levees and channels, guarding against flooding while respecting the riparian environment.

RIVER BELOW LEMOORE WEIR

Two miles below Lemoore Weir, the river changes direction, curving from west to south. At the Excelsior Avenue bridge, the river flows fully back into **Kings County** before it curves toward the west to Army and Island weirs. The Army Corps of Engineers lists the channel's capacity between Laton and Army Weir as 9,100 c.f.s.

KRCD CHANNEL MAINTENANCE

Protecting what has historically been flood country is the **Kings River Conservation District**. Its Riverdale-based flood maintenance staff maintains the primary channels and levees to ensure that the river's flood-carrying capabilities are maximized. Although KRCD is occasionally involved with channel work in other areas, its primary zone of responsibility begins on **Cole Slough** near Eighth Avenue in northeastern Kings County and continues down the river to Empire No. 2 Weir near Stratford on the South Fork and to McMullen Grade (Highway 145) on Fish Slough (Fresno Slough). Other channels guarded by KRCD include all or parts of **Dutch John Cut**, **Clark's Fork**, **South Fork**, the **Crescent Bypass, North Fork,** and **Fresno Slough**. During periods of high water, KRCD provides round-the-clock levee patrols to guard against flooding.

CLARK'S AND SOUTH FORKS, AND TULARE LAKE

ARMY WEIR

The Kings River is unique that in its lower reaches it divides. The southerly channel is known in different stretches as **Clark's Fork** and the **South Fork**. It flows southeasterly and southerly into the Tulare Lake bed region. The division occurs 1 1/2 miles above State Route 41. **Army Weir**, constructed and maintained by the Army Corps of Engineers for flood control purposes, regulates flows into the Clark's Fork-South Fork system. Below State Route 41 are 30 individual pumping facilities which serve users in **Clark's Fork Reclamation District No. 2069**. A small channel along the district's southern boundary is the river's **South Fork**. One-half mile south of the Hanford-Armona Road, the South Fork and Clark's Fork combine as the South Fork. The Army Corps of Engineers lists the **South Fork's** capacity as 3,100 c.f.s. south of the approximate alignment of the Hanford-Armona Road.

Empire Weir No. 1

Located west of Lemoore (and south of State Route 198), **Empire No. 1 Weir** forms a large pool for diversions into the **Stratford**, **Westlake** and **Empire Westside** canals. The pool is of sufficient size to be useful to the KRWA watermaster's staff in re-regulating flows before making deliveries to units which divert at the two Empire weirs.

River Below Empire Weir No. 1

For four and a half miles below Empire No. 1 Weir, the **South Fork** meanders in a predominantly southerly direction. There are no KRWA points of diversion in this reach.

Empire Weir No. 2

A mile southwest of **Stratford** (immediately below State Route 41), **Empire No. 2 Weir** diverts Kings River water into the **Tulare Lake**, **Kings River-South Fork** and **Blakeley** canals which serve the **Tulare Lake bed**. One of two **Tulare Lake Basin Water Storage District** laterals from the **California Aqueduct** makes **State Water Project** deliveries immediately below the weir. **Lateral A** also makes State Water Project deliveries to the **Empire West Side Irrigation District** and **Kings County**. The **Stratford Irrigation District's Crabtree Ditch** begins at Empire Weir No. 2, which marks the South Fork terminus of KRWA authority and KRCD channel and levee maintenance.

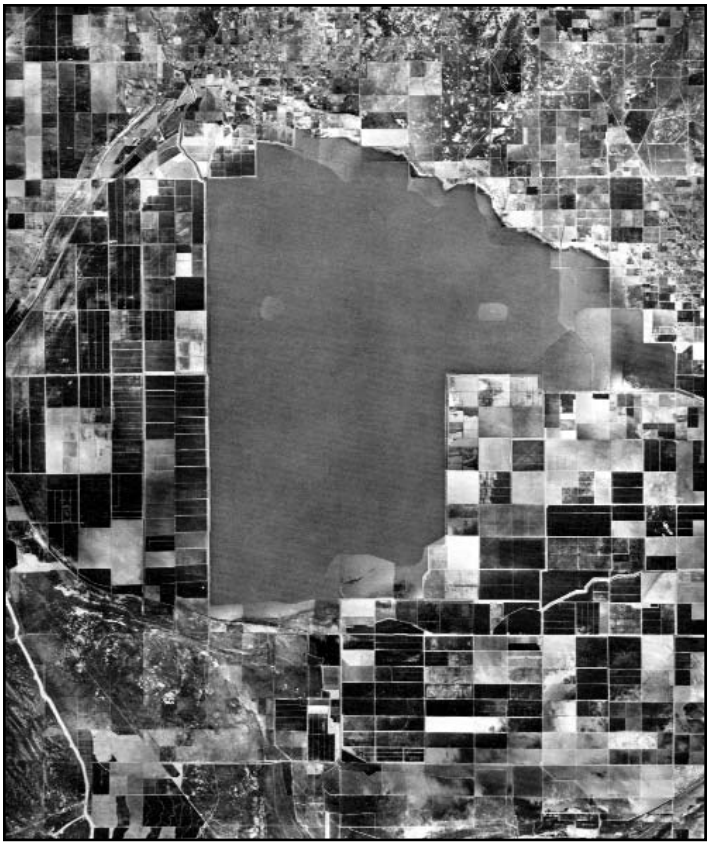
Recreation

Pools formed by the two Empire weirs hold some water at most times and generally are capable of supporting warm water fisheries. Each is popular with anglers. Water skiers occasionally make use of the large Empire No. 1 pool.

Tulare Lake Bed

The South Fork terminates in a truly unique area, the **Tulare Lake bed**. An alluvial fan formed over time by sediment deposited by the Kings River historically blocked the flows of several southern Sierra streams (including most Kings River flows) from flowing northwesterly through the valley trough to the San Joaquin River. The result was **Tulare Lake**, at one time the West's largest expanse of fresh water.

Upstream irrigation diversions from all streams tributary to Tulare Lake caused the lake to begin diminishing in the 1870s, a trend which accelerated along with the valley's east side settlement during the 1880s and early 1890s. By 1898, the natural lake was dry. That prompted reclamation of the lake bed's rich soils for farming and organization of reclamation districts to create channels and flood control levees. The lake reappeared during wet years but completely dried in many subsequent years prior to a huge 1937 flood. Farming quickly returned each time the lake receded.



Tulare Lake, as it reappeared during the flood of 1969.

Despite flood control projects developed on the Kings, Kaweah, Tule and Kern rivers between 1949-62, the Tulare Lake bed's lack of natural outfall dictates that all flood water entering Tulare Lake from those rivers and smaller uncontrolled streams must remain until consumed by evaporation or irrigation of unflooded basin fields. Heavy clay soils preclude measurable percolation.

The area, served by the Tulare Lake Basin Water Storage District and other public districts and mutual water companies, remains highly vulnerable to occasional flooding and drought-caused water supply shortages. The result, economically and physically, is that the Tulare Lake bed is farmed in large tracts upon which annual field crops are produced. Small farmers cannot endure the financial burdens of Tulare Lake bed agricultural operations even though the remaining 80% of the Kings River service area is dominated by small- to medium-sized units with a diversity of permanent and field crops.

Kings River-South Fork Canal

Below Empire No. 2 Weir, the **Kings River-South Fork Canal** flows another 10 miles into the **Tulare Lake bed's** bottom. After meandering for a few miles, the canal is channeled directly south to the lowest point in the Tulare Lake bed. There, it intersects the **Tule River Canal** from the east at a point 12 miles west of **Corcoran**.

North Fork, Fresno Slough and James Bypass

Island Weir

The **North Fork** is controlled by **Island Weir**, a few hundred feet from **Army Weir** above Highway 41. Along with making irrigation deliveries, the North Fork serves as the primary means of disposing of Pine Flat Dam flood releases. Under typical flood operations, the first 4,750 c.f.s. of flood release water is directed through the **North Fork-Fresno Slough-James Bypass** channel to the **San Joaquin River** and, ultimately, **San Francisco Bay**.

Island Weir, upstream from Highway 41 (north of Lemoore) marks the North Fork's beginning.

North Fork Below Island Weir

The **North Fork** flows directly west from **Island Weir**. For the next five miles there are no KRWA points of diversion. The Army Corps of Engineers lists the channel capacity through this reach at 6,300 c.f.s.

Crescent Weir and Flood Flows

A few miles southwest of **Riverdale** and four miles below State Route 41 is **Crescent Weir** where **North Fork** flood release quantities are typically measured and confirmed. Beginning here are the **Crescent Canal Company's** ditch and **Laguna Irrigation District's Summit Lake Ditch**. The North Fork's channel below Crescent Weir becomes known as **Fresno Slough**. In all reaches below Crescent Weir, the main channel's capacity is listed by the Army Corps of Engineers as 4,750 c.f.s. The first 4,750 c.f.s. of Pine Flat Dam's flood release (or whatever flow is deemed proper by the Army Corps of Engineers) is carried by Fresno Slough and its related channels to the San Joaquin River. When the Corps determines that flood releases cannot be fully handled beyond Crescent Weir, the Corps may order the balance of the flood release diverted into the **Clark's Fork-South Fork** system for disposal in the **Tulare Lake bed**.

Crescent Bypass

The **Crescent Bypass** begins at **Crescent Weir**. This five-mile-long channel can be utilized under extreme flood conditions to move water into the **Tulare Lake bed**. The Crescent Bypass has only rarely been used since its construction in the 1920s, even though its channel was improved by KRCD as part of the Army Corps of Engineers plan for lower river flood control. In 1969 and 1997, the bypass transported flood water into the Tulare Lake bed. In 1983, it was briefly utilized by Tulare Lake interests as a key link in a unique pump-back operation devised to evacuate flood water from Tulare Lake into the San Joaquin River.

Summit Lake and Fresno Slough

South of **Lanare** in western Fresno County, the **North Fork's Fresno Slough** channel reaches the trough of the San Joaquin Valley and arcs northwesterly, crossing into **Fresno County** at Excelsior Avenue. This was originally a portion of the **Summit Lake** country. A region of tules and channels, this area connected Tulare Lake and the South Fork with Fresno Slough and the San Joaquin River over the Kings River's alluvial fan through Boggs Slough, Summit Lake and other channels which, for the most part, no longer exist. The area began to dry after Tulare Lake dropped below the "summit's" 207-foot elevation about 1880. Agricultural development and reclamation of the Summit Lake region followed and was complete by 1920.

Stinson Weir

Three and a half miles northwest of Lanare on Fresno Slough is **Stinson Weir**, point of diversion for the **Stinson Canal and Irrigation Company's** canal. Under normal operating conditions, the Stinson Canal is KRWA's last North Fork system point of diversion (although other historic points of diversion still exist downstream).

Fish Slough and the James Bypass

East of **Helm**, the primary North Fork channel retains its flow-carrying characteristics but changes names. It follows **Fish Slough** past State Route 145 (McMullen Grade), where the Kings River Conservation District's levee and channel maintenance ends, into the 12-mile-long **James Bypass**. Fish Slough and the James Bypass, their levees and the main channel in its man made course, are elements of a flood control project developed in 1913-14 which relieved **Old Fresno Slough** of bearing high Kings River flows. Below Stinson Weir, the main channel usually carries water only during flood release operations or exceptionally high discharges from Mill and Hughes creeks.

Old Fresno Slough

The small original Fresno Slough channel meanders for nearly 15 miles, from southeast of **San Joaquin** to north of **Tranquillity**, a few miles west of **James Bypass**. It is no longer a part of Kings River operations. A large portion of the old slough is now managed as a wetlands area by the California Department of Fish and Game.

James-Tranquillity Exchange

A 1963 agreement involving the two most northwesterly KRWA units, the **James** and **Tranquillity irrigation districts**, resulted in water being imported into the Kings River service area on a regular basis. The two districts leased their average annual Kings River entitlements to other lower Kings River units at a price equal to that paid by James and Tranquillity to purchase a like amount of **Central Valley Project** water delivered at Mendota Pool through the **Delta-Mendota Canal** under a U.S. Bureau of Reclamation contract. Up to 26,600 acre-feet of James and Tranquillity entitlement in any one year is credited by the lower Kings River units toward helping facilitate minimum Pine Flat releases for fish and wildlife, channel conveyance losses and other administrative purposes. James and Tranquillity benefit by avoiding enormous Kings River channel losses in exchange for water deliveries from Mendota Pool while assisting other Kings River units in resolving their own channel loss problems. The James district also maintains a large wellfield.

James Weir

Located just below McMullen Grade, **James Weir** is a diversion point for the **James Irrigation District**. Except for infrequent diversions from Kings River flood releases, this diversion point has not been used since the late 1950s.

James Bypass Gaging Station

Located on James Bypass immediately below the Placer Avenue bridge east of Tranquillity, this gaging station is operated by the **U.S. Bureau of Reclamation** to measure Kings River system flows into the San Joaquin River.

Mendota Pool's waters cover Fresno Slough's confluence with the San Joaquin River on the valley's west side.

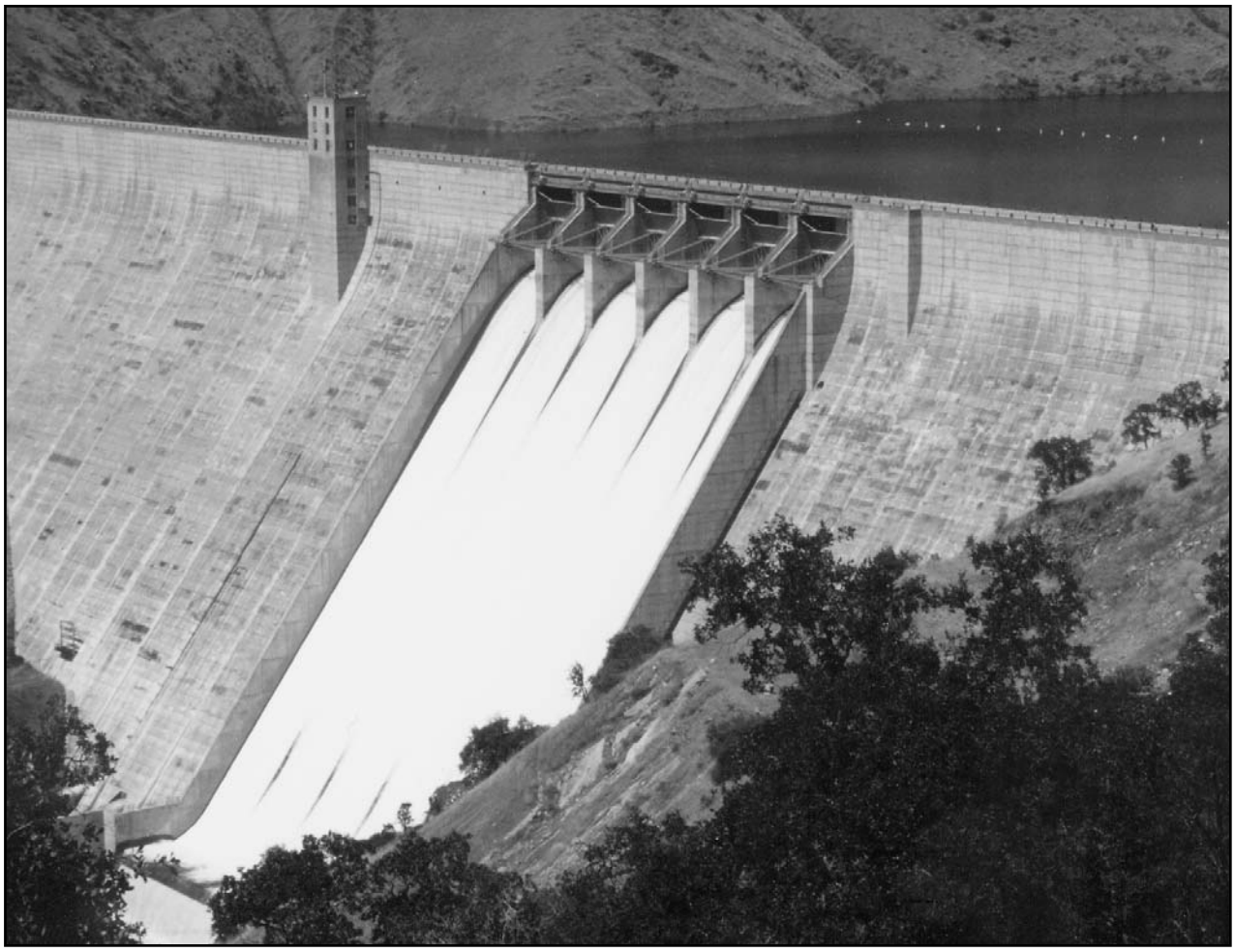
Mendota Pool

The Kings River's North Fork system ends at the confluence of the **San Joaquin River** in **Mendota Pool**, a shallow lake formed by a small dam, one mile northeast of **Mendota** and 35 miles west of Fresno. **Central Valley Project** exchange deliveries of north state water are made into Mendota Pool through the Delta-Mendota Canal. The lowest reaches of Fresno Slough are inundated by Mendota Pool, beginning not far below the confluence of the James Bypass and Fresno Slough, north of Tranquillity, within the Mendota Wildlife Area.

San Joaquin River

The **San Joaquin River** is the northerly terminus of the Kings River's North Fork system. The San Joaquin bears Kings River flood flows from Mendota Pool up the valley's west side to **San Francisco Bay** and the **Pacific Ocean**. At no other time does Kings River water reach the San Joaquin River. Historically, the Kings was not considered to be a San Joaquin River tributary.

KINGS RIVER WATER USERS



For those who live and work within its one million acre service area, there is no more precious resource than the Kings River. The Kings supports important fisheries, recreational opportunities and pleasing aesthetic values. But the river means so much more in a land of little rain. The Kings is the source of most water used in homes, businesses and industries and on farms within the Kings River service area. The river is the means by which the Sierra Nevada's annual snowpack is beneficially used every day by hundreds of thousands of people to sustain and improve their lives. Truly, the Kings River is the life's blood of our region's economy.

AGRICULTURAL WATER USERS

The more than one million acres within the Kings River service area include one of the world's most incredibly fertile farming regions. Kings River water makes it possible. Water from the river is used for farm irrigation use that ultimately benefits consumers with high-quality, farm products.

TOP VALUE

Sustained largely by Kings River water, **Fresno County** for decades was the nation's No. 1 county in gross agricultural receipts. **Tulare County**, some of which relies upon Kings River water, moved into the top spot in 2001. Values of crops grown in **Kings County** are also proportionately among the nation's leaders. Well over 200 crops are grown commercially within the Kings River service area, thriving under a combination of fertile soil, favorable hot and dry summer weather, and s stable water supply. Gross agricultural revenues of more than $3 billion are generated annually within the Kings River service area.

FARMS RELYING ON THE RIVER

There are approximately 15,000 farms within the service area. The vast majority are modest family farming operations. Farm sizes average about 66 acres. Each farm relies upon the Kings River for a surface water supply or for replenishment of the groundwater reservoir which supplies farm wells.

THE IMPORTANCE OF AGRICULTURE

Farming operations made possible by the Kings River and other Sierra rivers and streams contribute enormously

Kings Rive water irrigates crops which help generate 29 percent of all Central Valley jobs.

to the San Joaquin Valley's economy. A University of California study in 1992 on "The Measure of California Agriculture" concluded that agriculture generates 29 percent of all Central Valley jobs and about $1 of every $3 of Central Valley personal income. Each dollar earned in agriculture stimulates other economic activity. In many rural Kings River service area communities, irrigated agriculture and its support industries are essentially the entire local economy.

URBAN WATER USERS

A rapidly-growing population of well over three quarters of a million people lives within the Kings River service area. Nearly three dozen cities, towns and villages depend upon groundwater conjunctively used and obtained from Kings River surface supplies to meet their municipal and industrial water needs.

CITY OF FRESNO

The region's largest city, **Fresno** has swiftly grown to embrace thousands of acres of former agricultural land. Water which in past years would have flowed through the **Fresno Irrigation District's** canal system to irrigate what was then farmland now is delivered by FID to percolation basins, such as Leaky Acres near the **Fresno Yosemite International Airport**. Those basins help recharge the groundwater reservoir which supplies the city's water. Fresno also has under contract 60,000 acre-feet of Class 1 Central Valley Project water from the CVP's Friant Division which FID delivers to recharge basins. The City of Fresno is currently in the process of constructing a $31.5 million surface water treatment plant near Chestnut and International avenues. When completed, the plant each day will provide more than 90 acre-feet of water from the Kings and San Joaquin rivers, helping relieve the overdrafted aquifer that underlies northeastern Fresno. It will be the first direct delivery of surface water for municipal and industry purposes within the Kings River service area.

OTHER CITIES

Also depending upon groundwater supplied by the Kings River are **Clovis**, **Sanger**, **Reedley**, **Parlier**, **Kingsburg**, **Selma**, **Fowler**, **Kerman** and **San Joaquin** in Fresno County; **Hanford**, **Lemoore** and **Corcoran** in Kings County; and **Dinuba** in Tulare County. Wells are the sole source in each of those cities and more than two dozen other unincorporated towns.

WATER FOR THE FISHERY

The Kings River sustains important fisheries and wildlife resources which are managed by the California Department of Fish and Game.

ABOVE PINE FLAT DAM

Fishery needs in the **main stem Kings River** depend upon the river's natural flow. The **North Fork** fishery is maintained with releases from Pacific Gas and Electric Company reservoirs. **Pine Flat Reservoir** water storage has historically supported an excellent fishery.

PINE FLAT DAM IRRIGATION RELEASES

In most months, fishery water needs below Pine Flat Dam are met through releases made on behalf of Kings River Water Association units. These flows, particularly during the hot summer months, tend to be greater in volume and colder in temperature than would have been possible under pre-project conditions.

MINIMUM FISHERY RELEASES

Other water conditions and minimum release obligations by KRWA member units are addressed within the **Kings River Fisheries Management Program Framework Agreement**, adopted May 28, 1999. This pact superceded a 1964 agreement between the KRWA and California Department of Fish and Game (CDFG) and significantly increased river flows for many miles below Pine Flat at times when there are no irrigation demands or flood release requirements. KRWA members are now providing enhanced minimum flows of at least 100 cubic feet per second in the nine miles of river between Pine Flat Dam and Fresno Weir (near the Friant-Kern Canal). That amount is about twice the former requirement in most years. Flows of between 35-45 c.f.s. (depending upon the time of year) over Fresno Weir and into the lower river are now required.

Planting trout eggs in the river is one of the identified elements to enhance the fisheries in the Kings River.

Changes in rates of releases from Pine Flat Dam under low-flow conditions are minimized to avoid adversely affecting fish life.

FISHERY IMPROVEMENTS

KRCD and KRWA are in the forefront of a variety of Kings River environmental activities and studies, including their important partnership with the CDFG in the Kings River Fisheries Management Program, established in 1999. An active **Public Advisory Group** is an essential part of the Fisheries Management Program. KRCD, with the backing of KRWA, was the local cost-sharing sponsor for the Corps of Engineers **turbine bypass** construction project at Pine Flat Dam and has similarly supported Corps studies into other potential environmental enhancement projects. In each case, KRCD and KRWA have worked cooperatively, seeking feasible means of improving the Kings River's fishery without damaging the river's urban and agricultural water users.

THE GROUNDWATER RESERVOIR

THE GROUNDWATER RESERVOIR

A vast groundwater reservoir underlies most (but not all) of the Kings River service area. It is of tremendous importance in meeting the region's agricultural and domestic water needs.

AREAS LACKING GROUNDWATER

In portions of the **Alta Irrigation District** near the Sierra foothills and within the **Tulare Lake bed**, little or no groundwater is available.

HOW GROUNDWATER IS SUPPLIED

Groundwater resources are naturally supplied by the region's aquifer, seepage from the Kings River's sandy channel and by irrigation water which percolates through unlined canals or which is not consumed by plants. Groundwater recharge is greatly aided simply by not pumping or by use of percolation ponds. Most portions of the Kings River service area depend upon this conjunctive use of surface and groundwater.

IN DRY YEARS

Since the Kings River's runoff fluctuates widely, there are many years which the surface water supply does not meet the area's water needs. Pumping is used by growers to meet dry-year irrigation needs. Those "withdrawals" from the groundwater "bank" usually result in sharp groundwater table declines.

In Wet Years

Surface water use decreases the need to pump and naturally recharges the groundwater reservoir. Several districts in the service area maintain ponding basins to allow flood-release water to be used for groundwater recharge purposes. In wet years, because of this conjunctive use of surface and groundwater, the groundwater table often rises toward the surface, a positive result of groundwater banking "deposits."

The Downward Trend

Unfortunately, since "wet" years occur an average of only four years out of 10, the long-term trend is a groundwater table decline. During the severe 1987-92 drought, the average water table within the KRCD dropped 34 feet. That reduction in groundwater storage was more than 3.8 million acre-feet, nearly four times the capacity of Pine Flat Reservoir.

Seeking Solutions

Both the KRCD and KRWA are committed to easing or ending the region's groundwater overdraft and are searching for ways improve conditions, both in the short and long term. KRCD's staff is working closely with districts and companies that deliver water to Kings River users on a variety of studies, activities and projects. KRCD oversees three groundwater management areas. KRWA and its member units are also involved in studies aimed at better utilizing Kings River floodwater flows for improving groundwater conditions and the region's overall water supplies. The KRCD and KRWA remain fully engaged in state and regional discussions over future groundwater policy and law.

The Kings River's Support Agencies

Four agencies are directly involved with managing or improving the Kings River and its resources. The Kings River Water Association and Kings River Conservation District each serve the river's entire service area but are separate organizations with completely different authorities, responsibilities and duties. The Army Corps of Engineers is in charge of Pine Flat Dam and the river's flood control. The California Department of Fish and Game oversees fishery matters.

Kings River Water Association

The **Kings River Water Association** is a private organization. The association is voluntarily formed as part of the 1927 Kings River agreement by the river's water user organizations.

THE WATERMASTER: **The Kings River watermaster** is in charge of administering the river, water entitlements, storage, releases and diversions.

AGREEMENTS, SCHEDULES AND STORAGE: Complex agreements and water schedules based on the river's mean daily natural (pre-project) flow at Piedra decide the entitlement of each KRWA member on any given day. The watermaster's staff converts each member unit's daily entitlement into shares of storage in Pine Flat Reservoir. Kings River Water Association members have contracted for 1,006,500 acre-feet of Pine Flat Reservoir storage space.

RELEASES AND DIVERSIONS: Except for flood releases (which are directed by the Corps of Engineers), the watermaster's staff manages Pine Flat Dam water releases and deliveries to KRWA units' respective diversion points, accounting for any water-amount losses or gains in conveyance. Complete and continuous records are compiled and maintained for each diversion point.

KINGS RIVER WATER ASSOCIATION'S UNITS: The 28 member Kings River units include 13 public districts and 15 mutual water companies in portions of Fresno, Kings and Tulare counties.

A KRWA hydrographer records the river's flow reading at the gaging station located at the People's Weir.

Kings River Conservation District

The Kings River Conservation District is a public agency encompassing 1.2 million acres within portions of Fresno, Kings and Tulare counties. Formed in 1951, the Fresno-based District's territory embraces and, in some areas, extends beyond the Kings River service area. KRCD's mission is to provide flood protection, achieve a balanced and high quality water supply and develop Kings River power resources, all for the public good. The District, a lead Kings River resource agency, embraces a vision that includes a balanced groundwater basin, a reliable power supply, effective and efficient flood protection, and balanced environmental actions.

ENVIRONMENTAL AND FISHERY PROJECTS: KRCD continually conducts environmental studies and monitoring projects on behalf of all Kings River users and under terms of the District's Federal Energy Regulatory Commission license. Those include monitoring of dissolved oxygen and temperature in the river and reservoir, fish population and creel surveying, fishery studies, fish and wildlife enhancement projects, revegetation of some riparian zones, and studies aimed at documenting endangered and threatened animals, plants and natural communities within the Kings River service area.

FLOOD CONTROL: KRCD in the 1950s assumed perpetual flood control responsibilities to protect vulnerable properties along the lower Kings River's channels. Those duties include channels and levee system maintenance and levee patrols at times of high water.

WATER MANAGEMENT: Improving on-farm water efficiency and conservation is the focus of KRCD's water management program. Its staff conducts surface and groundwater management studies, and works with individual growers and irrigation districts to make the most of the service area's water supply.

HYDROELECTRIC GENERATION: KRCD operates the Pine Flat Power Plant, a three-unit facility completed in 1984 at the base of Pine Flat Dam which operates only with water released to meet irrigation demand or flood control requirements when the reservoir contains more than 100,000 acre-feet of storage. In the past, the KRCD has pursued or studied water storage and hydroelectric projects at other locations.

PEAKER POWER: Late in 2002, KRCD and the California Department of Water Resources entered into a power purchase agreement for two small power plants designed to help meet the valley's peak energy demand. When completed, the plants will have a combined output of 90 megawatts, enough to serve some 90,000 homes. The program came about because of a settlement between the state and an energy firm under which the DWR received six gas-fired turbine-generator sets. The state is providing two of these units to KRCD at no cost. KRCD is involved in finding sites for the facilities, obtaining all permits, finance, constructing and operating the new generation. The agreement covers 10 years. During that time, the California DWR will acquire all energy produced by the plants and pay all fixed and variable costs, including debt service, as long as KRCD meets strict plant availability requirements. After 10 years, KRCD will be able to market or distribute the power.

WEATHER MODIFICATION: KRCD is the lead agency in one of the nation's oldest weather modification programs which enhances precipitation over the Kings River watershed. KRWA, Pacific Gas and Electric Company and the California Department of Water Resources are cooperating agencies.

U.S. Army Corps of Engineers

The **Corps of Engineers** operates and maintains Pine Flat Dam and Reservoir, administers recreational facilities around the reservoir and is in charge of all matters pertaining to flood control, including flood releases from Pine Flat Dam. KRWA member units reimburse the Corps of Engineers 37.4 percent of all costs related to the Pine Flat project's operation and maintenance (except recreation).

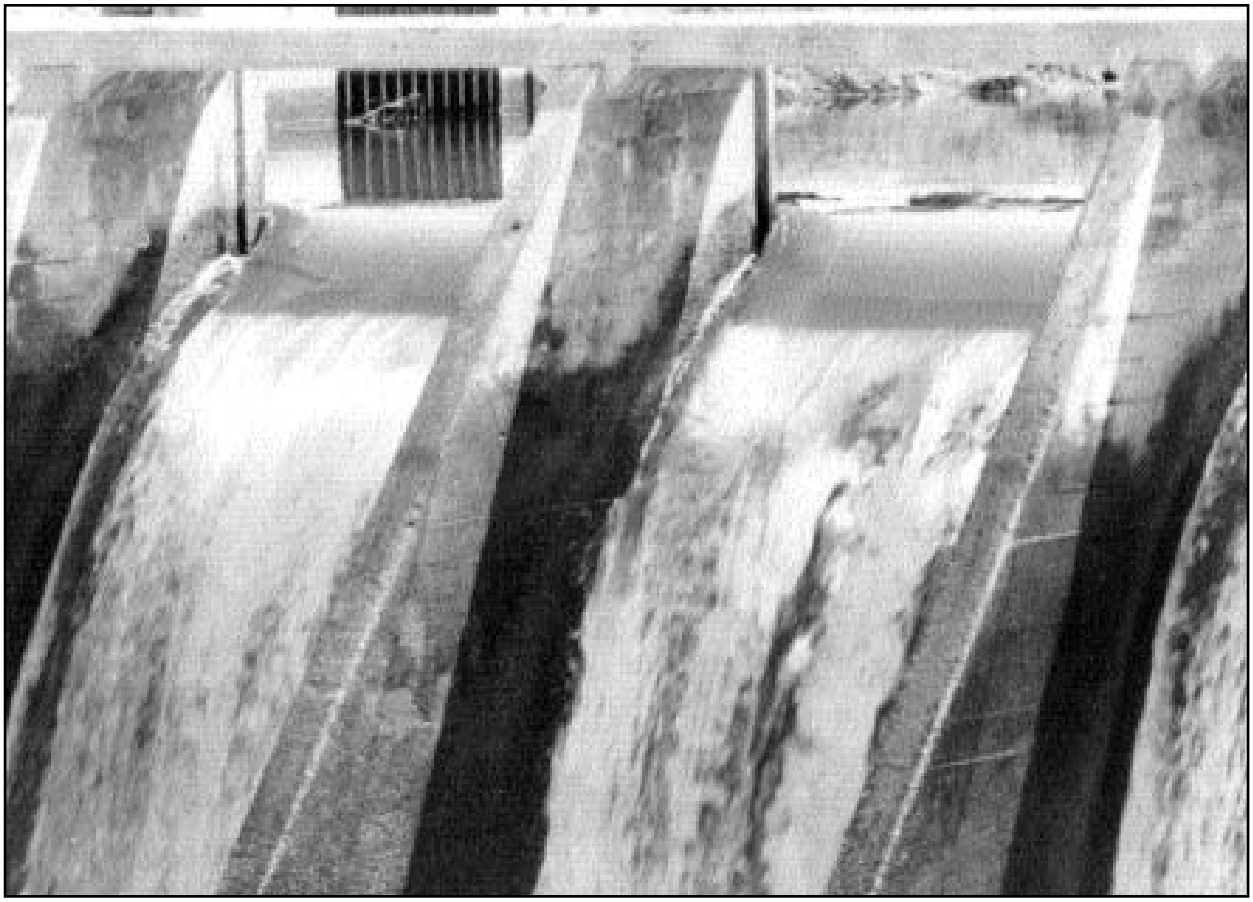
California Department of Fish and Game

The **California Department of Fish and Game** is in charge of managing the Kings River's fishery.

Kings River Fisheries Management Program

The **Kings River Fisheries Management Program** is the culmination of an exciting and extraordinary partnership between the KRWA, KRCD and CDFG. The program's agreements, signed on May 28, 1999, resulted in significantly enhanced minimum fishery flows below Pine Flat Dam and creation of a temperature control pool of 100,000 acre-feet (subject to critically dry conditions beyond reasonable control). Many habitat improvement projects have been undertaken or are in the process of being studied or planned. KRCD and KRWA agreed to each provide $50,000 (a total of $100,000) per year for 10 years to help fund projects, and the CDFG agreed to seek like amounts of state funding. The Fisheries Management Program is defined by its Framework Agreement as "an enhancement program that will, among other benefits, extend trout habitat suitability throughout the year in most years, and for longer periods in every year than existed historically." It is governed by an **Executive Policy Committee**, and includes a **Technical Advisory Committee** and **Public Advisory Group**.

KRWA Member Units



The Kings River Water Association's 28 member units, although united in their interests in issues and overall water conditions affecting the river, are highly individualistic. Their sizes vary greatly as do the needs of those the various units serve. Not only do the 13 public districts and 15 mutual water companies have unique characteristics, each unit enjoys Kings River water entitlements and Pine Flat Reservoir storage rights that are separate and distinct from all other units.

Upper River Agenices

Alta Irrigation District

The **Alta Irrigation District**, a public agency, is located east and south of the Kings River and was California's first public irrigation district (in 1888) to actually deliver water to its users. The district's Alta Canal transports water into a system which serves the area from **Reedley** to an area west of **Orange Cove** in eastern Fresno County, and the **Dinuba**, **Orosi** and **Traver** areas of northern Tulare County.

SERVICE AREA (acres) 129,300
PINE FLAT STORAGE SHARE (acre-feet) 100,000
UPSTREAM STORAGE SHARE (acre-feet) 19,275
DIVERSION POINT . . . . . .South end of '76 Channel, at Frankwood Avenue

289 North L Street, P.O. Box 715, Dinuba 93618. Telephone 591-0800.

Fresno Irrigation District

A public agency, the **Fresno Irrigation District's** territory encompasses much of the northern valley floor portion of Fresno County and embraces the cities of **Fresno** and **Clovis**. Other communities within the FID service area include **Kerman** and **Biola**. The district's service area is the largest of any KRWA member unit. The Fresno entitlement under the complex Kings River water diversion schedules is the largest of all KRWA units. Surface water transported by FID to groundwater recharge basins sustains the groundwater which is presently the only source of municipal and industrial water for the metropolitan Fresno-Clovis area. Although the cities are only utilizing groundwater, in 2004 the City of Fresno is scheduled to come on line with a surface water treatment plant. Surface water used for agricultural irrigation is also a major groundwater recharge contributor. The district stretches from the base of the Sierra foothills to west and south of Kerman. FID's internal water distribution system is extensive and complex. FID also provides water (through the Fresno entitlement) to the **Freewater County Water District** north of **Sanger**. FID is the only KRWA unit with a long-term contract (75,000 acre-feet of Class 2 water) from the **Central Valley Project's Friant Division**. The district also takes delivery of the **City of Fresno's** Class 1 Friant water, amounting to 60,000 acre-feet annually.

Fresno Weir is an important point of diversion northeast of Centerville. The Fresno and Consolidated canals begin here.

SERVICE AREA (acres) 235,000
PINE FLAT STORAGE SHARE (acre-feet) 119,000
UPSTREAM STORAGE SHARE (acre-feet) 22,937
DIVERSION POINTS . . . . . .Gould Weir and Fresno Weir northwest of Centerville

2907 South Maple Avenue, Fresno 93725. Telephone 233-7161.

Consolidated Irrigation District

Consolidated Irrigation District, a public agency, serves a large portion of southeastern Fresno County and smaller areas in northwestern Tulare County and northeastern Kings County. Communities and their rural neighborhoods served by the district include **Sanger**, **Del Rey**, **Parlier**, **Fowler**, **Selma**, **Kingsburg** and **Caruthers**. The district extends from northeast of Sanger to south of **Kingsburg** and west of **Caruthers**. Along with an extensive internal distribution system, Consolidated was a San Joaquin Valley pioneer in developing a system of groundwater recharge basins, storing water in the underground reservoir in wet years for use (by pumping) in dry years and by those lacking access to surface water supplies. Consolidated also administers the **Lone Tree Channel**, a separate water delivery system. Church water rights are held by about 8,000 acres within CID's boundaries and are historically linked to rights granted by Fresno irrigation pioneer Moses J. Church.

SERVICE AREA (acres) 144,000
PINE FLAT STORAGE SHARE (acre-feet) 120,000
UPSTREAM STORAGE SHARE (acre-feet) 23,130
DIVERSION POINT . . . . . .Fresno Weir

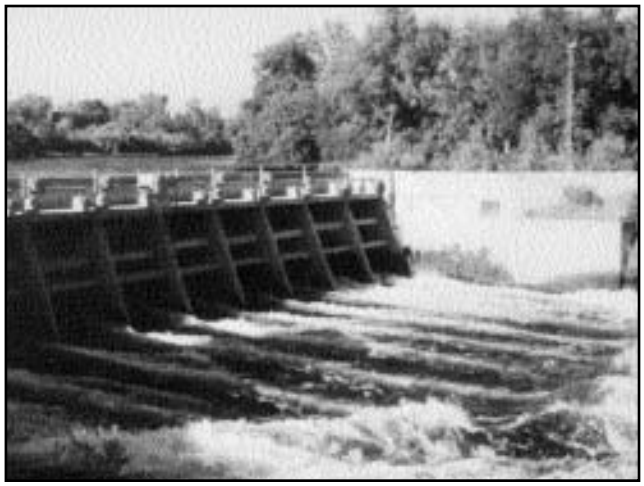
2255 Chandler Street, Selma 93662. Telephone 896-1660

Kings River Water District

A public agency, the **Kings River Water District** serves much of the Centerville Bottoms area northeast, east and southeast of Sanger. Its good water right (based upon the earliest Kings River diversions in the 1860s) and small delivery system capacity combine to enable the district to deliver water for much of the year.

SERVICE AREA (acres) 15,400
PINE FLAT STORAGE SHARE (acre-feet) 15,000
UPSTREAM STORAGE SHARE (acre-feet) 2,908
DIVERSION POINTS 17

15142 East Goodfellow Avenue, Sanger 93657. Telephone 875-7721



Consolidated Irrigation District takes delivery of its Kings River water through this headgate at Fresno Weir. It is the river's largest point of diversion.

Lower River Agencies, Freeway 99 to Army and Island Weirs

Peoples Ditch Company

A mutual water company, the **People's Ditch Company** provides water service over an extensive portion of northeastern Kings County (including the Hanford area) as well as making deliveries to stockholders in the Tulare Lake bed. The company operates **People's Weir**, the river's largest such structure, three-quarters of a mile below Freeway 99 and just south of Kingsburg. In wet years, surplus water delivered through the People's Ditch is ponded in the **Kings County Water District's** extensive system of groundwater recharge basins and channels.

SERVICE AREA (acres) . . . . . .No Designated Service Area
PINE FLAT STORAGE SHARE (acre-feet) 107,000
UPSTREAM STORAGE SHARE (acre-feet) 20,624
DIVERSION POINT . . . . . .People's Weir, south of Kingsburg
870 Greenfield Avenue, P.O. Box 1261, Hanford 93232. Telephone 584-2341

Corcoran Irrigation Company

A mutual water company, the **Corcoran Irrigation Company** serves the Corcoran area of eastern Kings County with water transported 25 miles through the **Lakelands Canal** system from **People's Weir**, south of Kingsburg.

SERVICE AREA (acres) . . . . . .No Designated Service Area
PINE FLAT STORAGE SHARE (acre-feet) 30,000
UPSTREAM STORAGE SHARE (acre-feet) 5,782
DIVERSION POINT . . . . . .People's Weir, south of Kingsburg
1001 Chase Ave., Corcoran 93212. Telephone 992-4127

Laguna Irrigation District

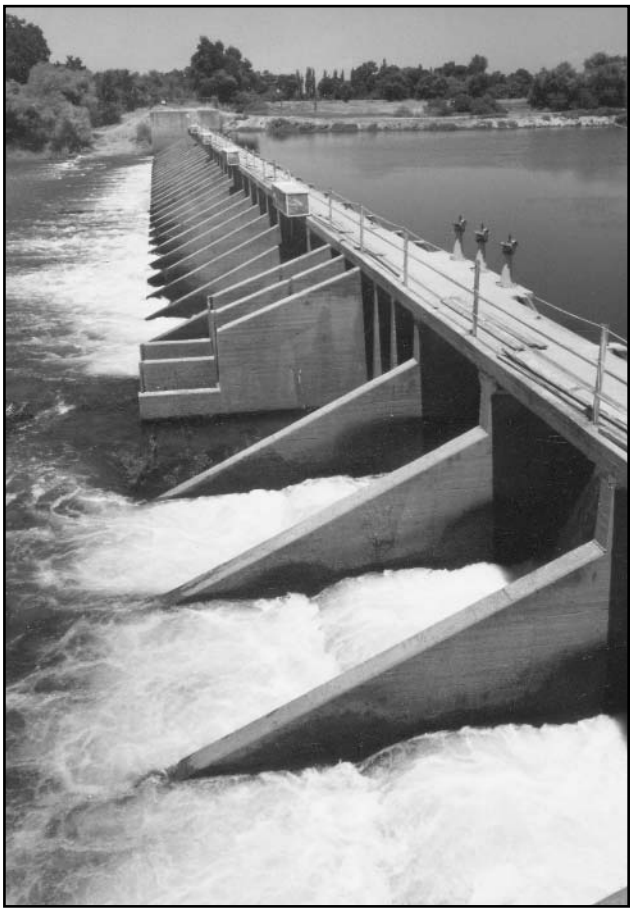
A public agency, the **Laguna Irrigation District** serves an area of southern Fresno County and northern Kings County west of Laton and south, southeast and southwest of Riverdale. The service area includes a substantial portion of the historic *Rancho Laguna de Tache* grant. The district's southerly boundary is generally along the Kings River. Laguna has multiple points of diversion. Those supply the **Grant Canal**, **A Ditch**, **Island Canal** and **Summit Lake Ditch**.

SERVICE AREA (acres) 35,000
PINE FLAT STORAGE SHARE (acre-feet) 44,000
UPSTREAM STORAGE SHARE (acre-feet) 8,481
DIVERSION POINTS . . . . . .Reynolds Weir, Island Weir, Crescent Weir
5065 192 Avenue, Riverdale 93656. Telephone 923-4239

Reed Ditch Company

The **Reed Ditch Company** is a mutual water company serving a small area northwest of Riverdale with water delivered through Murphy Slough.

SERVICE AREA (acres) 3,500
PINE FLAT STORAGE SHARE (acre-feet) 7,333
UPSTREAM STORAGE SHARE (acre-feet) 1,413
DIVERSION POINT . . . . . .Murphy Slough, from Reynolds Weir, Laton
P.O. Box 445, Riverdale, 93656. Telephone 866-8600



People's Weir, located a mile downstream from Highway 99, is the largest such structure on the Kings River. Water is diverted here into portions of Kings County.

Riverdale Irrigation District

The **Riverdale Irrigation District** is a public agency serving rural portions of the Riverdale community between Murphy Slough and the Kings River's North Fork. The district's Kings River entitlement is combined with the **Reed Ditch Company** and **Liberty Mill Race Company** under the **Murphy Slough Association**.

SERVICE AREA (acres) 12,200
PINE FLAT STORAGE SHARE (acre-feet) 22,000
UPSTREAM STORAGE SHARE (acre-feet) 4,240
DIVERSION POINT . . . . . .Murphy Slough, from Reynolds Weir, Laton
21027 South Brawley Avenue, P.O. Box 683, Riverdale 93656. Telephone 867-3123.

Liberty Mill Race Company

A mutual water company receiving water through Murphy Slough, the **Liberty Mill Race Company** serves an area north and northwest of Riverdale and near Burrel.

SERVICE AREA (acres) 8,100
PINE FLAT STORAGE SHARE (acre-feet) 14,667
UPSTREAM STORAGE SHARE (acre-feet) 2,827
DIVERSION POINT . . . . . .Murphy Slough, from Reynolds Weir
P.O. Box 223, Riverdale 93656. Telephone 867-4502

Burrel Ditch Company

A mutual water company, the **Burrel Ditch Company** delivers water diverted from Murphy Slough into the company's small service area in the Burrel area, east of Fresno Slough.

SERVICE AREA (acres) 4,500
PINE FLAT STORAGE SHARE (acre-feet) 11,000
UPSTREAM STORAGE SHARE (acre-feet) 2,120
DIVERSION POINT . . . . . .Murphy Slough, from Reynolds Weir
3899 West Davis Avenue, Riverdale 93656. Telephone 867-3545

Liberty Canal Company

A mutual water company, the **Liberty Canal Company** delivers water through the **Liberty Canal**, which flows northwesterly from Laton to the company's service area north of Riverdale.

SERVICE AREA (acres) 5,300
PINE FLAT STORAGE SHARE (acre-feet) 4,000
UPSTREAM STORAGE SHARE (acre-feet) 771
DIVERSION POINT . . . . . .Reynolds Weir, Laton
21027 South Brawley Avenue, P.O. Box 223, Riverdale 93656. Telephone 867-3123

Last Chance Water Ditch Company

A mutual water company, the **Last Chance Water Ditch Company** serves stockholders within a large portion of Kings County, southwest of Laton and north and west of Hanford as well as portions of the Tulare Lake bed.

SERVICE AREA (acres) 39,000
PINE FLAT STORAGE SHARE (acre-feet) 64,000
UPSTREAM STORAGE SHARE (acre-feet) 12,336
DIVERSION POINT . . . . . .Last Chance Weir, Main Kings River, near Laton
1716 N. 11th Avenue, Suite G, Hanford 93230. Telephone 584-4681

Lemoore Canal and Irrigation Company

A mutual water company, the **Lemoore Canal and Irrigation Company** serves stockholders in the Lemoore area of Kings County. The company's large service area has one of the most substantial lower river water entitlements.

SERVICE AREA (acres) 52,300
PINE FLAT STORAGE SHARE (acre-feet) 100,000
UPSTREAM STORAGE SHARE (acre-feet) 19,275
DIVERSION POINT . . . . . .Lemoore Weir, two miles southwest of Laton
877 W. Iona Ave., P.O. Box 647, Lemoore 93245. Telephone 924-1246

John Heinlen Mutual Water Company

The **John Heinlen Mutual Water Company** serves stockholders in a Kings County area north and northwest of Lemoore.

SERVICE AREA (acres) 13,100
PINE FLAT STORAGE SHARE (acre-feet) 10,000
UPSTREAM STORAGE SHARE (acre-feet) 1,927
DIVERSION POINTS . . . . . .Lemoore Weir and three South Fork pumps
877 W. Iona Ave., P.O. Box 647, Lemoore 93245. Telephone 924-1246.

South Fork Agencies, Army Weir to Empire Weir No. 2

Clark's Fork Reclamation District No. 2069

Clark's Fork Reclamation District No. 2069 delivers a limited amount of water to the Kings County "island" formed by the Kings River's Clark's Fork and South Fork channels northwest of Lemoore. The district, a public agency, has no district distribution system. Diversions are all by pumping through 30 individual pumping facilities along the Clark's Fork and South Fork channels.

SERVICE AREA (acres) 1,920
PINE FLAT STORAGE SHARE (acre-feet) 3,000
UPSTREAM STORAGE SHARE (acre-feet) 578
DIVERSION POINTS . . . . . .30 individual pumps, Clark's Fork and South Fork
P.O. Box 874, Lemoore 93245. Telephone 924-9320

Upper San Jose Water Company

The **Upper San Jose Water Company** serves a narrow area about seven miles long along the western side of the South Fork, Clark's Fork and the Crescent Bypass, just east of Lemoore Naval Air Station in Kings County.

SERVICE AREA (acres) . . . . . .No Designated Service Area
PINE FLAT STORAGE SHARE (acre-feet) 4,000
UPSTREAM STORAGE SHARE (acre-feet) 771
DIVERSION POINTS . . . . .South Fork pumps, Summit Lake Canal, Crescent Canal
944 Whitley Avenue, Corcoran 93212. Telephone 992-3118

Empire No. 1 Weir serves the Empire West Side and Stratford Irrigation districts.

Empire West Side Irrigation District

A public agency, the **Empire West Side Irrigation District** serves a narrow territory which stretches more than seven miles along the South Fork's right (west) bank

from above Empire No. 1 Weir to below Empire No. 2 Weir, an area running northwest to southwest of Stratford in Kings County. The district is also a **State Water Project** contractor with deliveries made through Lateral A, which leaves the California Aqueduct at Kettleman City.

SERVICE AREA (acres) 6,400
PINE FLAT STORAGE SHARE (acre-feet) 13,000
UPSTREAM STORAGE SHARE (acre-feet) 2,506
DIVERSION POINT . . . . . .Empire Weir No. 1, southwest of Lemoore
21990 Laurel Avenue, P.O. Box 66, Stratford 93266. Telephone 947-3027

Stratford Irrigation District

A public agency, the **Stratford Irrigation District's** service area is along the left (east) bank of the South Fork, below Empire No. 1 Pool. The district serves the Stratford area of Kings County.

SERVICE AREA (acres) 9,800
PINE FLAT STORAGE SHARE (acre-feet) 11,000
UPSTREAM STORAGE SHARE (acre-feet) 2,120
DIVERSION POINTS . . . . . .Empire Weirs No. 1 and No. 2
P.O. Box 538, Stratford 93266. Telephone 924-1246

Lower River Agencies, Empire No. 2 Weir and Tulare Lake Bed

Tulare Lake Basin Water Storage District

A public agency, the **Tulare Lake Basin Water Storage District** manages South Fork water deliveries at **Empire No. 2 Weir** near Stratford in Kings County. Its boundary includes nearly the entire Tulare Lake bed. The district is a State Water Project contractor and is connected to the California Aqueduct by Lateral A and Lateral B. Despite the district's state contract, the Tulare Lake bed units rely most heavily on Kings River water for irrigation purposes.

SERVICE AREA (acres) 185,800
PINE FLAT STORAGE SHARE (acre-feet) 33,229
UPSTREAM STORAGE SHARE (acre-feet) 6,404
DIVERSION POINT . . . . . .Empire Weir No. 2, Stratford.
1001 Chase Avenue, Corcoran 93212. Telephone 992-4127/Fax 992-3891

Lovelace Water Corporation

A private water company, the **Lovelace Water Corporation** provides water deliveries to stockholders in portions of the Tulare Lake bed through the Kings River South Fork Canal and the Tulare Lake Canal.

SERVICE AREA (acres) . . . . . .No Designated Service Area
PINE FLAT STORAGE SHARE (acre-feet) 4,000
UPSTREAM STORAGE SHARE (acre-feet) 771
DIVERSION POINT . . . . . .Empire Weir No. 2, Stratford
P.O. Box 488, Corcoran 93212. Telephone 992-2131

Tulare Lake Reclamation District No. 761

A public agency, **Tulare Lake Reclamation District No. 761** receives most of its water supply through the Blakeley Canal, originating at Empire Weir No. 2, and Lateral A from the State Water Project. The district delivers water to lands on the western and southwestern sides of the Tulare Lake bed in Kings County.

SERVICE AREA (acres) 40,800
PINE FLAT STORAGE SHARE (acre-feet) 40,647
UPSTREAM STORAGE SHARE (acre-feet) 7,835
DIVERSION POINT . . . . . .Empire Weir No.2, Stratford
23311 Newton Avenue, Stratford 93266. Telephone 947-3328

Empire Weir No. 2, located at Highway 41 near Stratford, regulates releases of Kings River water into the Tulare Lake bed.

Tulare Lake Canal Company

A mutual water company, the **Tulare Lake Canal Company** provides water deliveries to stockholders in portions of the Tulare Lake bed.

SERVICE AREA (acres) . . . . . .No Designated Service Area
PINE FLAT STORAGE SHARE (acre-feet) 40,647
UPSTREAM STORAGE SHARE (acre-feet) 7,835
DIVERSION POINT . . . . . .Empire Weir No. 2, Stratford
1001 Chase Avenue, Corcoran 93212. Telephone 992-4127

Southeast Lake Water Company

A mutual water company, the **Southeast Lake Water Company** provides water deliveries to stockholders in portions of the Tulare Lake bed.

SERVICE AREA (acres) . . . . . .No Designated Service Area
PINE FLAT STORAGE SHARE (acre-feet) 18,477
UPSTREAM STORAGE SHARE (acre-feet) 3,561
DIVERSION POINT . . . . . .Empire Weir No. 2, Stratford
1001 Chase Avenue, Corcoran 93212. Telephone 992-4127

LOWER RIVER AGENCIES, NORTH FORK AND FRESNO SLOUGH

CRESCENT CANAL COMPANY

A mutual water company, the **Crescent Canal Company** serves an area west of the North Fork and Fresno Slough, several miles west of Riverdale. Deliveries are through the company's **Crescent Canal**.

SERVICE AREA (acres) 14,400
PINE FLAT STORAGE SHARE (acre-feet) 22,500
UPSTREAM STORAGE SHARE (acre-feet) 4,337
DIVERSION POINT . . . . . .Crescent Weir, south of Riverdale
11054 West Mount Whitney Avenue, Riverdale 93656. Telephone 866-5671

STINSON CANAL AND IRRIGATION COMPANY

A mutual water company, the **Stinson Canal and Irrigation Company** serves an area west of the left bank of the North Fork and Fresno Slough, west and northwest of Burrel. Deliveries are through the company's **Stinson Canal**.

SERVICE AREA (acres) 15,500
PINE FLAT STORAGE SHARE (acre-feet) 20,000
UPSTREAM STORAGE SHARE (acre-feet) 3,855
DIVERSION POINT . . . . . .Stinson Weir, west of Riverdale
1100 W. Shaw Avenue, Suite 148, Fresno 93711. Telephone 229-4740

JAMES IRRIGATION DISTRICT

Largest in territory among North Fork units, the **James Irrigation District** is a public agency. The district formerly served its agricultural users with Kings River water diverted through the **James Main** and **Beta Main** canals. Since 1963, the district's primary surface water supply (under water exchange agreements between the James and Tranquillity irrigation districts and the other lower river units) has been **Central Valley Project** water pumped from **Mendota Pool** under a U.S. Bureau of Reclamation contract. James diverts Kings River water only when flood release flows are available. The district also maintains a substantial wellfield operation.

SERVICE AREA (acres) 25,800
PINE FLAT STORAGE SHARE (acre-feet) . . . . . .20,000 *
UPSTREAM STORAGE SHARE (acre-feet) . . . . . .3,855 *
DIVERSION POINTS . . . . . .James Weir, southeast of San Joaquin; Mendota Pool
P.O. Box 757, San Joaquin 93660. Telephone 693-4356.

* — A total of 26,600 acre-feet of the entire storage allotment of the James and Tranquillity irrigation districts is considered to be part of KRWA's Pine Flat Primary Operations Storage Pool under the James and Tranquillity agreements with the lower river units.

TRANQUILLITY IRRIGATION DISTRICT

Most northwesterly of all KRWA units is the **Tranquillity Irrigation District**, a public agency. The district's surface water supply (under the James and Tranquillity exchange agreement) is from the Central Valley Project under a U.S. Bureau of Reclamation contract and is pumped from Mendota Pool. Tranquillity's former Kings River diversion facilities, the **Lone Willow Channel** and **Beta Main Canal**, were last used in 1958 and are abandoned.

SERVICE AREA (acres) 10,700
PINE FLAT STORAGE SHARE (acre-feet) . . . . . .8,000 **
UPSTREAM STORAGE SHARE (acre-feet) . . . . . .1,542 **
DIVERSION POINT . . . . . .Mendota Pool
25390 West Silveira Street, P.O. Box 487, Tranquillity 93668. Telephone 698-7225.

** Please see James Irrigation District note.

Another day comes to close as Kings River water, beneficially used on more than a million acres of the worlds richest farmland and by a rapidly growing population, continues to flow toward the valley floor and portions of Fresno, Kings and Tulare counties.

THE KINGS RIVER THROUGH HISTORY

1800

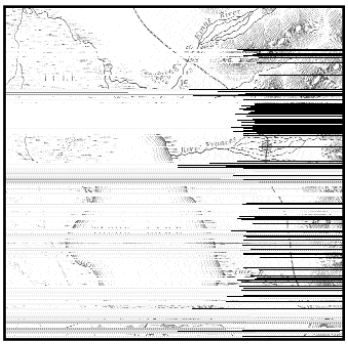
1805: Gabriel Moraga, on January 6, discovers and names *El Rio de los Santos Reyes*, River of the Holy Kings.

1840

1846: *Rancho Laguna de Tache* land grant made by Mexico along lower Kings River.

1850

1850: California achieves statehood. All of Kings River is initially within Mariposa County.
1852: Tulare County organized.
1852-55: Poole's Ferry (north of modern Reedley) in operation.
1854: Whitmore's Ferry established at Kingston.
1856: Fresno County organized.
1856: Smith's Ferry established at modern Reedley.
About 1858: First Kings River diversions, Centerville Bottoms.



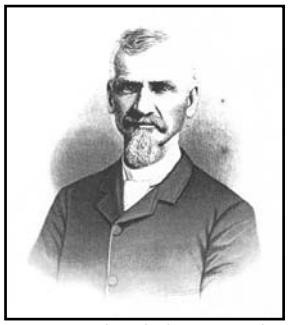
The Kings River and "Tache Lake" (Tulare Lake), among the few features mapped by an Army expedition in 1850, California's statehood year.

1860

1861: Massive flood begins to form Cole Slough channel.
1863: First Centerville Ditch developed.
1866: First Kings River water claim filed.
1867: Largest Kings River flood ever observed, completes Cole Slough formation, destroys town of Scottsburg.
1868: Dutch John Cut (east of Laton) initially developed as small ditch.
1869: Kings River first bridged at Kingston (west of modern Laton).

1870

1870-71: Fresno, Lemoore canals developed.
1872: Gould Canal developed.
1872: Zalda Canal developed near Riverdale; floodwaters later enlarge the canal into what became the Kings River's North Fork.
1872: Central Pacific Railroad establishes Fresno, bridges Kings River.
1873: People's Ditch, Grant Canal developed.
1874: Last Chance Ditch developed.
1875: Lone Tree Channel, Riverdale Ditch developed.
1877: Centerville and Kingsburg Canal developed.
1878: Tulare Lake fills and spills through Summit Lake and into Fresno Slough and San Joaquin River for last time.



Moses J. Church, known as the "father of Fresno Irrigation" for developing the Fresno Canal and its company.

1880

1882: Liberty Canal, Liberty Millrace Ditch developed.
1882-83: '76 (Alta), Fowler Switch canals developed.
1883: Drought-year lawsuits assert riparian rights; Fresno Canal brush dam blown up.
1885-88: Water users lose riparian cases.
1885-86: Crescent Canal developed.
1887: Wright Act authorizes formation of irrigation districts.
1888: Alta Irrigation District organized.
1889: Stinson Canal organized.

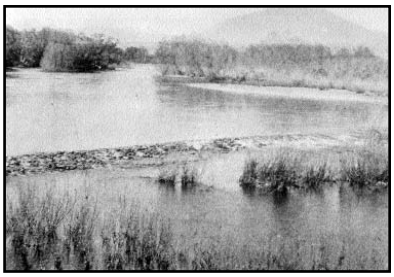
1890

1890: Burrel Ditch developed.
1891: Reed Ditch established.
1892: Fresno Canal & Irrigation Company buys lower river riparian lands, water rights.
1892-93: Original James Canal developed.
1893: Kings County formed, named for river.
1895-1900: First Tulare Lake bed canals developed as lake recedes.
1896: English financiers take over Fresno Canal Company, Laguna lands.
1897: First water entitlement schedule covers low flows.
1898-1917: Fresno Canal Company's I. Teilman administers river.
1898: Tulare Lake empties for first time.
1899: First practical agricultural pumping.

Looking over the Fowler Switch Canal headgate in 1898.

1900

1901: First surveys for Pine Flat Dam.
1902: Island flume built across Cole Slough near Kingsburg.
1903: Fresno Canal Company buys Consolidated Canal Company; effectively controls half of Kings River service area.
1906: Major flood event.



A rock and brush dam spans the river before construction of Fresno Weir in 1905.

1910

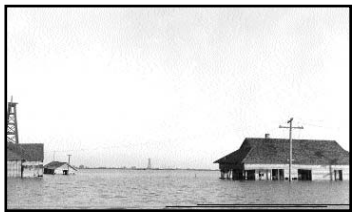
1912-14: James Bypass developed to avoid meandering Fresno Slough channel.
1914: Movement begins to develop Pine Flat Dam.
1915: Legislature passes Pine Flat-KRCD Act; district is not organized.
1916: Stratford Irrigation District formed.
1918: Tranquillity Irrigation District formed.
1919: Charles Kaupke becomes interim watermaster.

1920

1920: Reclamation of Summit Lake area completed southwest of Riverdale.
1920: Fresno, Laguna, James and Riverdale irrigation districts formed.
1921: Consolidated Irrigation District formed.
1921: Water users ask state to develop temporary water diversion schedule.
1923: First trial water entitlement schedule.
1923-24: Worst Kings River drought on record.
1925: Unsuccessful attempt made to form Kings River Water Storage District.
1926: Tulare Lake Basin Water Storage District formed.
1927: KRWA and permanent entitlement schedules established.
1927: First Kings River power plant developed at Balch Camp.
1928: Riparian rights subjected to reasonable beneficial uses.

1930

1931: Empire West Side Irrigation District formed.
1932: First groundwater recharging by Consolidated Irrigation District.
1933-36: KRWA proposes that CVP develop Pine Flat Dam.
1936: Congress assigns flood control to U.S. Army Corps of Engineers.

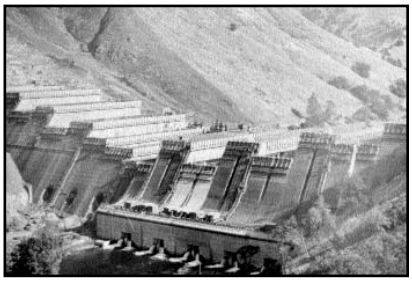


A portion of Tulare Lake that reappeared following two huge flood events in 1937.

1937: Major flood events in February, November.
1938-44: KRWA campaigns for Corps, not USBR-CVP, to build Pine Flat Dam.

1940

1940: Corps, USBR complete Pine Flat feasibility studies.
1940: Kings Canyon National Park formed, excludes reservoir sites in Cedar Grove, Tehipite Valley.
1944: Flood Control Act authorizes Pine Flat as Corps project.
1946: President Truman orders USBR to negotiate Pine Flat contracts.
1947: Ground broken on Pine Flat Dam.
1949: New master Kings River agreement signed.
1949: Pine Flat Dam construction under way.

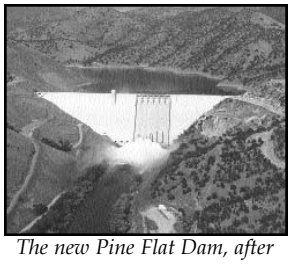


Pine Flat Dam begins rising over the Kings River in the early 1950s.

1949-50: Legislative bid to place Kings River in CVP.

1950

1950: KRWA launches effort to form Kings River Conservation District.
1950: Last major uncontrolled Kings River flood event.
1951: KRCD established, ratified by voters.
1953: KRCD negotiates interim Pine Flat contracts.
1953: First Pine Flat Reservoir water storage.
1954: Pine Flat Dam completed.
1954: Kings River weather modification program begins.
1955: Record Kings River flood flow captured safely in Pine Flat Reservoir.



The new Pine Flat Dam, after its 1954 completion.

1958: PG&E completes Wishon, Courtright lakes and new North Fork power plants.
1959: KRCD assumes lower river channel, levee operation, maintenance.

1960

1961: Interior Department makes bid to impose Reclamation Law, acreage limitation on Kings River.
1963: Permanent Pine Flat contracts, new master Kings River agreement signed.
1964: KRWA-CDFG fishery agreement signed.
1965: Cedar Grove, Tehipite Valley reservoir sites annexed to Kings Canyon National Park.
1965: KRCD, KRWA move into new Jensen Avenue offices.
1967: State Board grants Kings River water rights permits.
1968-69: First segment of levee, channel improvements developed by KRCD, Corps of Engineers.
1969: State Board declares Kings to be "fully appropriated."
1969: Huge snowpack prompts largest-ever Pine Flat releases into river, 17,000 c.f.s.

1970

1972: Kings River appears to prevail in Reclamation Law test case.
1973: Energy crisis spurs interest by KRCD in new power, reservoir projects.
1975: Preliminary Federal Power Commission permit given for Pine Flat Power Plant.

A lower Kings River channel left dry by the 1976-77 drought.

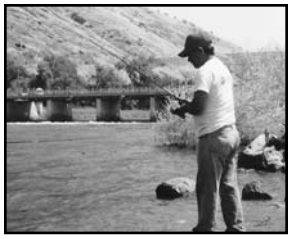
1976-77: Back-to-back critical drought years.
1977: KRCD, KRWA agree on Pine Flat Power Plant water use.
1977: KRCD voters authorize Pine Flat Power Plant bonds.
1977: U.S. Supreme Court upholds Reclamation Law imposition.
1978: KRCD applies to FERC for Dinkey Creek Power Project.
1979: Pine Flat Power Plant EIS completed.
1979: Pine Flat Power Plant water rights permit granted by state board

1980

1980: Pine Flat Power Plant construction begins.
1982: Congress relieves Kings River of Reclamation Law compliance.
1984: Pine Flat Power Plant completed, dedicated.
1985: Rodgers Crossing Dam feasibility study begins.

1986: Lack of power buyer halts Dinkey Creek Project.
1987: Federal legislation halts Rodgers Crossing Project.
1987-92: Worst extended sequential critical drought of record.

1990



An angler along the Kings River below Pine Flat Dam.

1991: Public trust complaint filed on fishery issues.
1991-99: KRCD, KRWA pursue long-term fishery solution.
1993: KRCD begins active involvement in Corps environmental studies.
1995: KRCD forms the first of three Groundwater Management Areas to aid in effort to improve groundwater resources.
1997: Record calculated flow, 112,000 c.f.s., on January 3; Pine Flat Dam prevents downstream flooding.
1999: KRCD, KRWA join CDFG in establishing Kings River Fisheries Management Program.

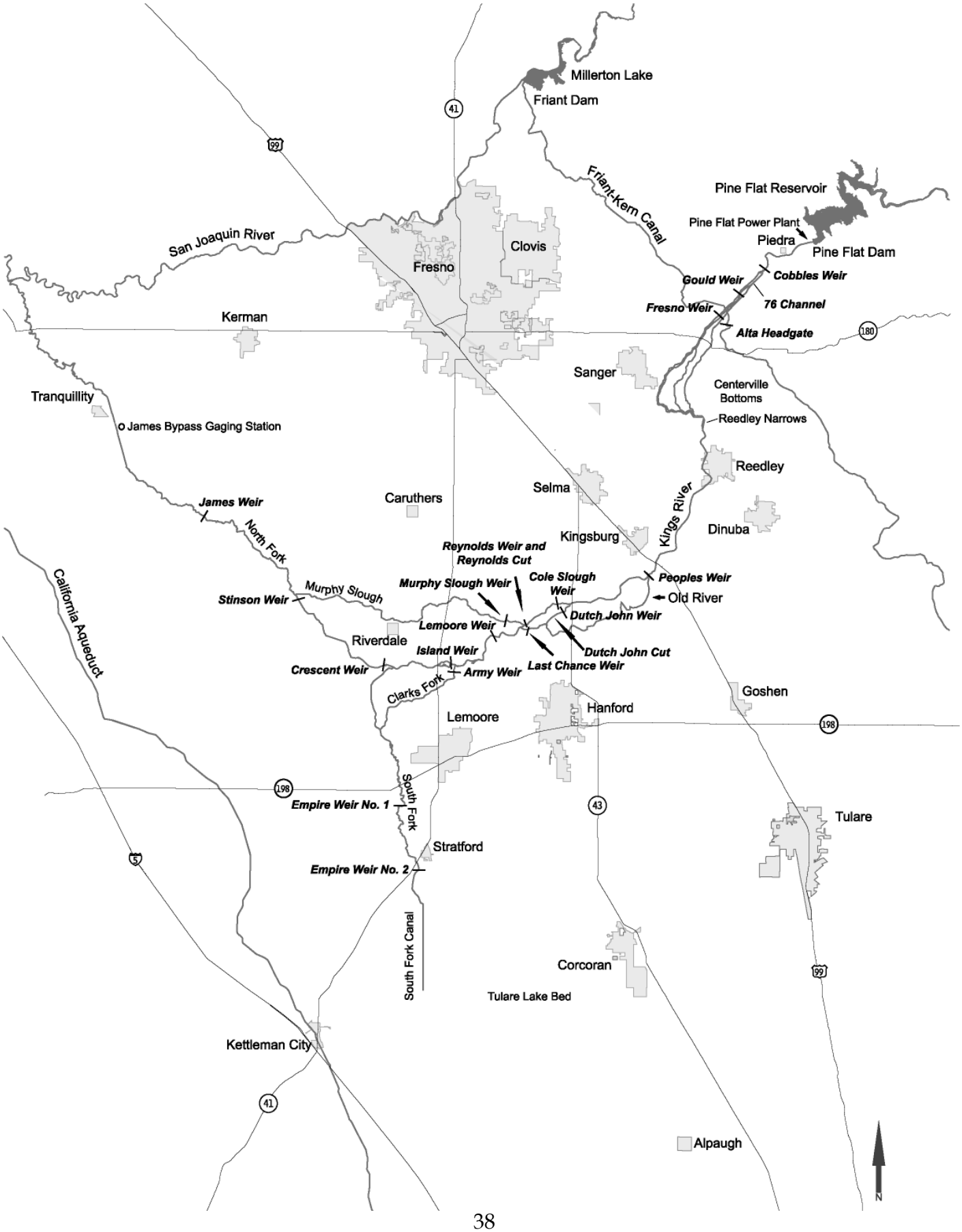
2000

2000: Thorburn Spawning Channel constructed near Piedra as first Kings River Fisheries Management Program project.
2001-2002: Several Kings River fishery habitat improvement projects undertaken.

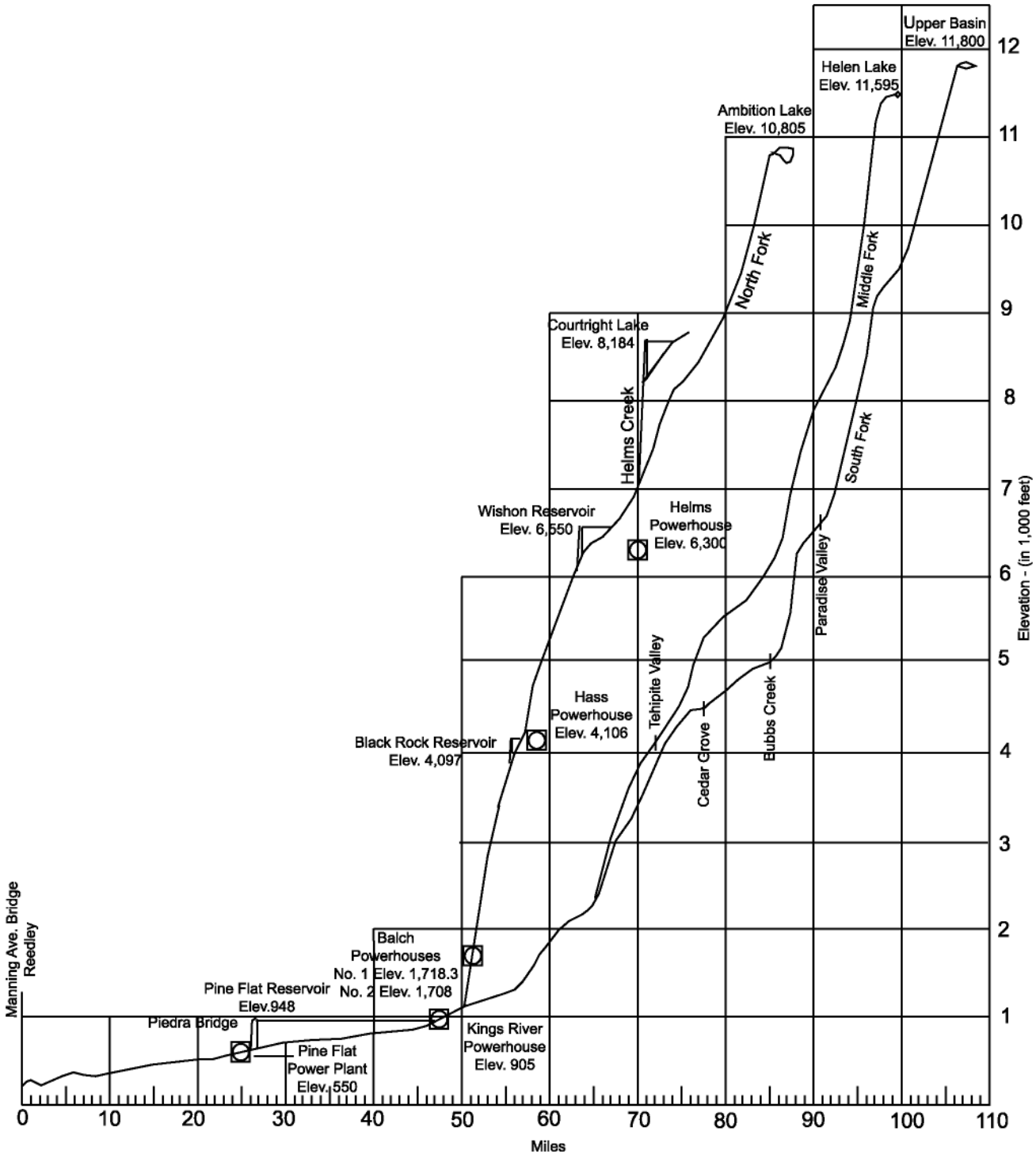
The Pine Flat Turbine Bypass is a tool to enhance the cold water fisheries below Pine Flat Dam.

2001: Energy crisis prompts KRCD to take new look at Dinkey Creek, Rodgers Crossing projects but both projects are ultimately placed back on the shelf.
2001: KRCD begins study of public power ownership.
2001: Corps study finds federal interest in Pine Flat multi-level intake structure.
2001: KRWA, Metropolitan Water District of Southern California begin studies of possible joint floodwater utilization projects.
2001: KRCD commemorates 50th anniversary.
2001: KRCD begins studies on how to increase availability, reliability and affordability of electrical energy within the Valley.
2001-03: Corps of Engineers constructs Turbine Bypass at Pine Flat Dam.
2002: KRWA begins installing telemetry at key locations to aid in water management.
2002: KRWA commemorates 75th anniversary.
2002: KRWA and KRCD lead organization of Southern San Joaquin Water Quality Coalition.
2002: KRCD reaches agreement with state DWR to construct two gas-fired "peaker" power generating plants.
2003: Pine Flat Dam Turbine Bypass System is completed and dedicated.

Features Along the Kings River



The Kings River's Profile



From high in the Sierra Nevada and scenic Kings Canyon in Central California, the Kings River plunges toward the San Joaquin Valley. The river's descent is abrupt, making possible Pacific Gas and Electric Company's extensive North Fork hydroelectric project. After passing through the Kings River Conservation District's Pine Flat Power Plant, the river's hard-working water flows into the thirsty valley. It brings life to more than a million of the Earth's most fertile and productive acres and dozens of communities. In so many ways, the Kings River is its service area's most valuable resource.

QUICK FACTS ABOUT THE KINGS RIVER

LOCATION AND LENGTH

Originates in the Sierra Nevada and continues through eastern and southern Fresno County, northwestern Tulare County and northern and central Kings County. One branch, including Clark's Fork and the South Fork, terminates in the Tulare Lake bed. The North Fork flows through Fresno Slough and the James Bypass to its confluence with the San Joaquin River at Mendota Pool. The length of the river is 272 miles.

AVERAGE ANNUAL RUNOFF

1,745,000 acre-feet, ranging from a high of 4,476,400 acre-feet (1982-83), to a low of 391,700 acre-feet (1923-24).

CONSUMPTIVE RIGHTS

Vested rights held by the 28 member agencies of the Kings River Water Association.

SIERRA NEVADA RESERVOIRS

Courtright Lake, Lake Wishon, Black Rock Reservoir, Balch Afterbay and Pine Flat Reservoir with total storage capacity of 1,254,000 acre-feet.

PINE FLAT RESERVOIR

Storage capacity of 1,000,000 acre-feet at normal maximum pool (elevation 951.5 feet), extending about 20 miles upstream from the dam, covering about 6,000 acres in surface area.

PINE FLAT DAM

Completed in 1954 by the U.S. Army Corps of Engineers. Provides water conservation and flood protection for the Kings River service area. A concrete-gravity structure 1,820 feet long and 429 feet high at its maximum section.

HYDROELECTRIC POWER FACILITIES

Pacific Gas and Electric Company: Helms Pumped Storage Powerhouse, Haas Powerhouse, Balch Powerhouses No. 1 and 2, and Kings River Powerhouse. Total electricity generating capacity, 1,547 megawatts.

Kings River Conservation District: Pine Flat Power Plant. Located at the base of the Pine Flat Dam on the Kings River. Water releases from the reservoir flow to the power plant through the dam in 13.5-foot, steel-lined penstocks to three generating units, each with a capacity of 55,000 kilowatts (55 MW). Electricity generating capacity, 165 megawatts. Average annual energy output is 418,000,000 kilowatt-hours.

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