



# Kings River FISHERIES NEWS



Summer 1998

Volume 1, No. 2

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Before Water Came To The Land

## The River's Agencies

*Their Staffs Team Up To Work Toward  
Enhancing The Kings' Fishery Resources*

CDFG, COE, KRWA and KRCD may sound like bureaucratic alphabet soup, but the studies they are blending may ultimately result in important environmental enhancement in the Kings River's fishery.

A tremendous amount of knowledge and understanding has been gained through data collection, field investigation and computer modeling by the California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (COE), Kings River Water association (KRWA) and Kings River Conservation District (KRCD).

Several important habitat improvement projects — some substantial, others modest — as well as new approaches to fishery management may result.

The four agencies most involved in all of this vary greatly from one another in their scope of authority and responsibility. All, however, share a common desire to work together as good Kings River stewards in search of means of making fishery improvements while respecting the river's crucial role as water supplier to a million of the world's most productive agricultural acres in Fresno, Tulare and Kings counties.

The agencies include the:

π U.S. Army Corps of Engineers, which operates and maintains Pine Flat Dam and Reservoir as a Kings River flood control project with important water conservation storage purposes. Congress in 1936 gave the COE responsibility for the nation's

*continued on page 8*

## About 'Fisheries News'

This is our second issue of Kings River Fisheries News, a publication of the Kings River Conservation District with the cooperation and participation of the California Department of Fish and Game and the Kings River Water Association.

The purpose of Fisheries News is to help you better understand the river's natural history and the Kings' important beneficial uses. Subsequent issues will explain why the fishery is such a focus of intense study, an effort which is laying the groundwork for more effective but reasonable ways of managing the Kings River's fishery resources.

Your comments and questions are welcomed. Please write to the Kings River Conservation District, 4886 East Jensen Avenue, Fresno, California 93725.

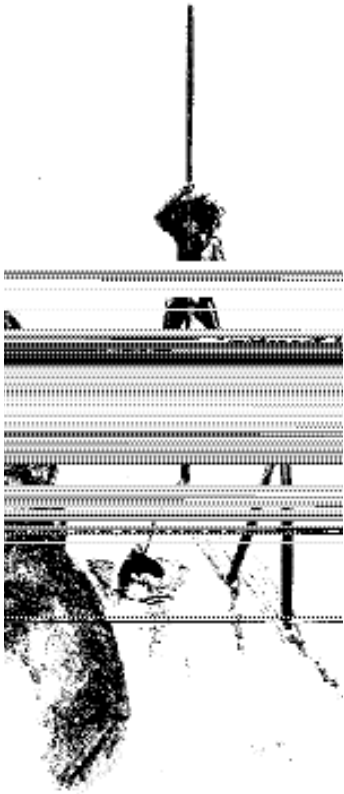
# Kings River Fisheries In Historical Perspective

## *Part II: Original Kings River Fisheries*

By

*Dale Mitchell,*

*California Department of  
Fish and Game*



The Kings River is similar to many other west-slope Sierra Nevada streams, receiving most of its natural stream-flow during the short snow-melt period from May to July. The Kings watershed tends to be drier and its stream temperatures tend to warm earlier in the year than more northern streams of comparable size. This natural seasonal warming, more than any other feature, dictates how and when the river's various fish species can utilize its different elevation reaches.

Different "guilds" of fish species have, over many centuries, become adapted to live in the river within particular elevation and temperature ranges. It is natural for these fishes' habitats to overlap during cold seasons, but the return of warm temperatures each summer serves to separate them, based on their differing temperature tolerances.

### *Upstream Trout*

In its alpine reaches, the Kings River and its tributaries were originally barren of fish. Steep gradients and bedrock barriers prevented access of fish to the upper elevations. Not until late in the last century were rainbow, golden, brown and eastern brook trout introduced into these alpine waters in "coffee-can" plants by packers and fishermen. For decades, the introduced populations were extended and maintained through the stocking of fingerlings by pack-train.



*Packing of golden trout over Cartridge Pass, Fresno County, 1929, by the Division of Fish and Game.*

Lower down, at elevations between about 1,000 and 7,000 feet, trout had passable upstream access. Water temperatures also remained cold enough to support trout and other cold-water species throughout the year. Consequently, rainbow trout and sculpin populations were already very well established at the

time of the earliest recorded observations. In 1853, Professor William H. Brewer, of the State Geological Survey, wrote, upon visiting the Kings River South Fork in the area of Roaring River:

*We got into the canyon of the south fork of Kings River and forded the stream, which is quite a river where we crossed, and camped at a fine meadow in the valley. It was a very picturesque camp, granite precipices rising on both sides to immense height. The river swarmed with trout; I never saw them thicker. The boys went fishing and soon caught about forty, while the soldiers caught about as many more.*

### *The Transition Zone*

Below the 1,000-foot elevation, temperatures were seasonally transitional. Trout were characteristically present throughout the cool season, but in late summer as snow runoff receded, temperatures quickly exceeded the 72 degree healthful limit for trout. Even at the upper edge of this zone at the 1,000-foot elevation (above the later site of Pine Flat Reservoir), temperatures commonly became too warm for trout in August and September.

Between 1928 and 1932, The State Fish and Game Commission attempted to establish a permanent trout hatchery, the Kings River Station, on the upper Kings River. The first attempt was at about the 900-foot elevation, near Trimmer. The second was at the 1,050-foot elevation, just downstream from the mouth of the North Fork. Neither hatchery succeeded in rearing trout past the fingerling stage, due to warm late-summer water temperatures that forced planting-out of the fish by mid July. Further downstream, the temperatures were even warmer. (This was long before the cooling influence of Pine Flat Reservoir).

In the lower river; particularly in the vicinity of Centerville bottoms, a few trout reportedly found refuge below cool, localized springs. However, it is evident from present-day high upstream temperatures, projected downstream by sophisticated modeling, that prior to Pine Flat Dam, the early-fall temperatures in the main-stem Kings River below the 1,000-foot elevation normally exceeded the healthful limits of trout and salmon.

Native minnows, including hardheads, squawfish and suckers, were adapted to take advantage of the habitat space that trout seasonally vacated. Adults of these species spawned in the cold temperatures of late spring. Their fry would hatch in mid summer, as the water warmed up— and as the trout vacated the transition zone. The fry would remain in the warm, shallow stream edges, feeding and gaining the advantage of body size before entering their first winter. When cool seasons resumed, trout would reinvade the transition zone, but by then most of the juvenile minnows would already be dispersing downstream.

In 1853, Colonel Andrew Grayson offered this description of the transition-zone native minnows, while visiting the Merced River:

*On September 21 we reached the Merced River at Snelings [Snelling], where we camped and caught our first fish and killed our first game— a few quail. The fish were full of fine bones— the same kind I have seen in all the fresh water streams in California— and a very poor fish to eat.*

### *Valley Floor Fisheries*



*The Kings River Station near Trimmer, 1928.*

*...prior to Pine Flat Dam, the early-fall temperatures in the main-stem Kings River below the 1,000-foot elevation normally exceeded the healthful limits of trout and salmon.*

The resident fishery on the valley floor, below the 550-foot elevation, was comprised of species adapted to endure warm late-summer and fall temperatures. These included Sacramento perch (a large native sunfish), Sacramento blackfish (a large native minnow), thicketail chub (a now-extinct minnow species), tule perch, and other species.

For centuries, all of these fishes were harvested and utilized by the indigenous Yokuts people of the area surrounding the lower Kings River and Tulare Lake, into which the Kings discharged its water. The Yokuts captured these fishes using spears, net-traps, baskets, hands and stupifying chemicals derived from plants.

Later on, during the 1880's, the Tulare Lake fishes (especially Sacramento perch) and turtles became the subject of commercial seine harvesting operations, serving large San Francisco markets. Trout reportedly also occurred in the commercial catch; however this would, by necessity, have been a seasonal occurrence. Trout could not have endured the prevailing summer temperatures in shallow Tulare Lake or in the valley-floor reaches of the Kings or other rivers. Reportedly, the entire commercial operation was seasonal, for fish could not be handled in summer temperatures without refrigeration. In 1887, a Stockton-based company considered establishing a cannery at Tulare Lake, in order to extend the harvest season.

### *Salmon and Steelhead*

Occasionally in high runoff years, Tulare Lake overflowed and connected through the Fresno Slough area to the San Joaquin River. Historical writings indicate that this occurred infrequently, in only seven or eight years between 1850 and 1912. The last natural overflow of the lake occurred in 1878. However, after the James Bypass flood control channel was constructed from the Riverdale area to Mendota Pool, between 1912 -14, it provided a more regular connection, bypassing more substantial Kings River flows to the San Joaquin. It operated more or less regularly until 1954, when Pine Flat Dam began controlling most of the Kings River's peak discharges.

The San Joaquin River is known to have sustained large runs of salmon prior to development of flood control and irrigation dams on its major tributaries. During overflow years, adult spring-run chinook salmon and steelhead sometimes strayed into the Kings River from the San Joaquin. Both species, reportedly, were speared and utilized by Choinimni Yokuts people near the mouths of Mill and Hughes creeks. However, the principal salmon spearing ground of these people was on the San Joaquin River; particularly at a place called Tihschachu, located near Cottonwood Bar, in the vicinity of present-day Kerman.

At Tihschachu, a general springtime truce was understood between the different Yokuts tribal groups from miles around, for the purpose of obtaining salmon. Tihschachu was clearly a very important salmon fishing location to all of the sub-groups of valley and foothill Yokuts, including the Choinimni. Its popularity probably was due to its year-to-year regularity. Such dependability would have been lacking along the Kings River, due to the infrequency of downstream flow connections.

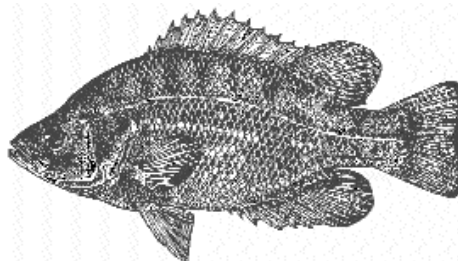
Valley historian Frank Latta wrote about the San



*Once an abundant transition-zone species, the hardhead is now designated as a California "fish species of special concern."*



*Two important native Tulare Lake species: The Sacramento blackfish (above) and Sacramento perch (below).*



Joaquin River:

*During the time when salmon were running, every bush and most of the ground was red with drying salmon.*

Although salmon adults entered and could feasibly spawn in the Kings River, it is unlikely that they established a true recurrent "run" with homing instincts to the Kings River or to other Tulare-Kern Basin tributaries. Survival and out-migration of spring-run salmon offspring to the ocean would have required more than one sequential wet year in which a connection existed to the San Joaquin River. Such sequential overflow years were very rare; occurring only twice between 1850 and the completion of the James Bypass in 1914. Any adult salmon straying into the Kings River would therefore have had their reproductive prospects greatly diminished as a result of their errant attraction into the more-often-than-not "closed" Kings watershed.

Using the access provided by the James Bypass, salmon began to enter the Kings River more regularly. Salmon were noted migrating through the Bypass and upstream as far as Trimmer in 1912 and 1914 although, more commonly, migrating fish only reached the Laton area, on the lower river. Adult salmon continued to appear sporadically in the Kings until the early 1940's, with notable numbers appearing in 1927, 1938 and 1940. However, successful out-migration of their progeny has never been documented.

Adult steelhead are also reported to have entered the Kings River and been utilized by the Yokuts people. If this occurred, it would have been as infrequently as salmon; occurring only when Tulare Lake overflowed.

The presence of resident rainbow trout within the upper Kings River watershed certainly is testimony that



steelhead reproduced successfully there and became "landlocked" at some time in the geologic past. Both adult and juvenile steelhead could have survived through the hot summer and from year to year in the Kings River by seeking higher elevations, but we can only speculate whether or not any of their offspring ever successfully passed back downstream through the maze of seasonally warm valley-floor waterways, to return to the ocean. Such migration opportunities would have been very infrequent. As with salmon, out-migration would require extremely precise and serendipitous timing.

### *Introduced Fishes*

Late in the last century, non-native black bass and sunfishes were introduced into California from the Delaware River. Within the lower Kings River, these warmwater predatory fishes were capable of surviving throughout the year and they became well established. While they featured attractive fisheries, their introduction probably contributed to the extinction of the once-plentiful thicketail chub, as well as the local elimination of Sacramento perch and several other native species.

### *Kings River Providence*

Today, the Choinimni are gone from the Kings River. The sand bars at Tihschachu are quiet; salmon and

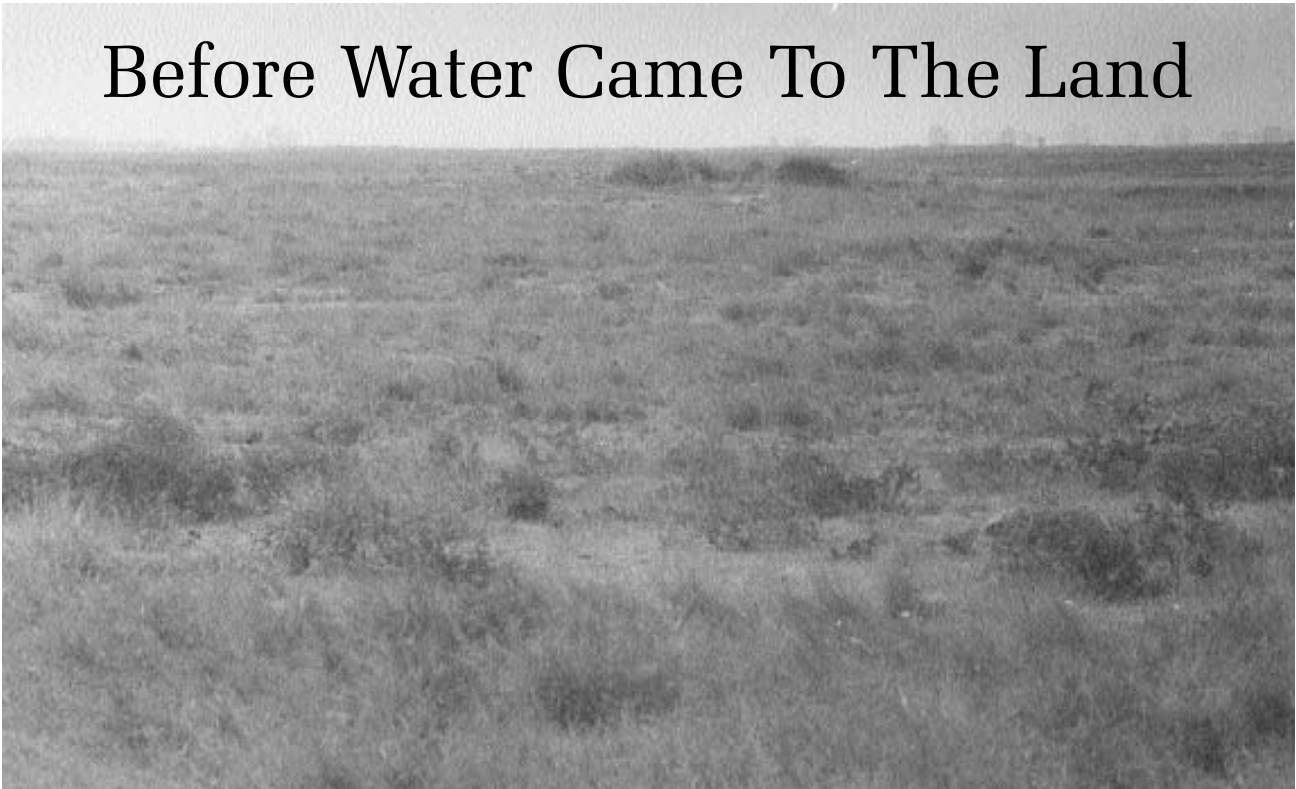
steelhead now have little access into that part of the San Joaquin River. Pine Flat Dam and Reservoir occupy the canyon where a segment of the Kings River formerly flowed, and a series of hydroelectric dams makes electricity with the water flowing out of the North Fork. The waters of the lower Kings River and Tulare Lake are now mostly controlled and intensively used for urban, agriculture and other beneficial purposes. The landscape is materially changed in exchange for the amenities and conveniences that each of us has come to expect in our day-to-day life.

Despite all these changes, trout and most of the other native foothill fishes continue to thrive today in the Kings River and Pine Flat Reservoir. While human-induced changes may have adversely affected some aspects of the landscape and fishery, they have also created some worthwhile opportunities for fishery enhancement, such as the cold "tail-water" below Pine Flat Dam that now supports all-year trout fisheries.

Accepting the Kings River's natural limitations along with some degree of change is a necessary part of seizing and taking advantage of the river's prospects. In following issues, we will discuss some of these changes and opportunities.



# Before Water Came To The Land



*A rare modern glimpse of how the valley's plains used to be.*

## *The Valley Floor Wasn't Much To Look At Before Kings River Water Made Irrigation Possible*

*By*

*J. Randall McFarland,  
Kings River Historian*

**T**o appreciate the magnitude of beneficial Kings River water usage necessitates a trip back through more than a dozen decades of natural and human history.

The land has been bountiful for so many generations that it is difficult to comprehend just how overwhelmingly desert-like much of the Kings River country, particularly north of the river, once was. Central San Joaquin Valley development has altered the Kings River service area's appearance with extraordinary thoroughness. Few non-riparian remnants of native flora remain on the valley floor.

Charles Kaupke, the first Kings River watermaster, wrote in 1957 in his book *Forty Years on Kings River*:

*It is hard to convince newcomers or casual visitors to Fresno, Kings and Tulare counties that a century ago this immensely productive section was a desert. . . . If you remain in the San Joaquin Valley for a time, you will learn that all this fertility is the product of human enterprise and cooperative effort.*

What landscape did nature provide on the valley plains that stretched seemingly endlessly away from the Kings River and other valley waterways? The answer, in the words of all who experienced those native conditions, was simple: Not much.

Lieutenant George H. Derby, who led an Army Topographical Engineers exploration through much of the southern San Joaquin Valley in the spring of 1850, had little good to say about much of what he saw:

*With the exception of a strip of fertile land upon the rivers emptying into the lakes from the east, it is little better than a desert. The soil is generally dry, decomposed and incapable of cultivation, and the vegetation . . . is extremely sparse.*

Derby's party passed through much of what later became the Alta Irrigation District, land he found to be "a barren sandy plain, interspersed here and there with spots of vegetation." On the west side, near Fresno Slough, Derby wrote:

*The country over which we passed between these sloughs was miserable in the extreme, and our animals suffered terribly for want of grass. There being no wood upon the plain, except an occasional willow on the largest slough, we could make no fires. . . .*

Derby believed the region to be "a horrible desert," but as Kaupke pointed out, "It must not be forgotten that the San Joaquin Valley never was a true desert; it merely looked like one to people from the well watered East or verdant counties along the Pacific Coast."

In gradually escalating numbers, those pioneers began arriving in the San Joaquin Valley between 1850-80. These remarkable individuals must have been inspired by a vision that went far beyond the stark and dry realities they encountered.

For instance, a later resident of Fowler related what was found in 1874 in traversing Fresno County's heartland:

*. . . At that time from the crossing at Kingsburg (to Fresno) we saw not one house or tree. . . . Not one team did we meet. We crossed no canals; we did not have a chance to water our horses on the way. The only living things on the way were horned toads and tarantulas.*

A few understood the change that irrigation was destined to make and why water was essential if the Kings River country were ever to be a place that might support human development.

As the *Fresno Republican* commented on March 17, 1877, in the midst of a terrible drought:

*The absolute necessity of irrigation in this valley is becoming apparent to even our oldest inhabitants. We*

*see the immense plains barren of vegetation in early spring, stock starving to death and farms of 200 to 300 acres sown to wheat with not enough growing on them to feed the horses used to put in the grain. We see the water of the San Joaquin running to waste and the water of Kings River taken out in small and imperfectly constructed ditches, affording water to comparably few of the vast numbers that might be supplied with it.*

The *San Francisco Chronicle*, in an August 22, 1881, article about the Kings River country's irrigation development reported:

*Even yet there are stretches of country many miles in extent where not a green spear grows — spots of grey earth, sparsely covered by dry grass and short brush that look as if they were destined never to yield one grain of sustenance to man or beast. Wherever water has not been forced to flow, the desert presents the same forbidding appearance. . . .*

"Who can tell what the future has in store for the agricultural interests of Fresno County?" the *Fresno Expositor* observed on October 7, 1874. "Is it not certain that the waters of our great rivers will be distributed over the vast plains by a network of aqueducts, and the barren plains 'neath the genial influence of our atmosphere `made to blossom as the rose?'"

That, of course, is exactly what happened as nearly all of the Kings River service area was transformed into farmland prior to 1900.

It was a new era, one in which the face of the one million acres now within the Kings River service area in Fresno, Kings and Tulare counties would be changed. This metamorphosis would prove to be comprehensive, swift and everlasting. Less than 40 years would be required to establish and complete a network of canals and ditches that soon were conveying large amounts of water from the Kings River to rapidly developing farmland. The Kings River country, equally quickly, began prov-

ing its worth as the most productive agricultural region the world has ever known.

Supplies of Kings River surface water made available by these canals are a principal reason why agricultural and social development, as it has been known in much of the Kings River service area for more than 120 years, is sustainable today.

Canal development was the single factor behind the country's initial development. Much of the land was considered originally to be a desert. Water was the resource needed to unlock the region's productivity, an inspiration for the pioneers who built their canals, often with back-breaking toil and personal sacrifice.

The landscape was not all that was altered, of course. Also changed was the Kings River's natural order. As occurred in rivers and streams all over California, beneficial uses of Kings River water by irrigators inevitably diminished the quantity of water flowing through the river's various reaches between the foothills and the Tulare Lake bed.

Weir structures, needed then as now to pool water for gravity diversion, were originally of rock and brush, rather than modern concrete. They began unavoidably affecting the river's environment well over a century ago. Use of the river's resources was, of course, thorough and effective.

As Kings River Watermaster Kaupke wrote in 1957:

*The land was here and so was the source of water supply, but men planned and toiled and went into debt to bring water to the land, and what you see today is the result of a vision tenaciously pursued against obstacles which often seemed overwhelming.*



# The River's Agencies, *continued*

flood control. The agency was authorized to build Pine Flat Dam under the Flood Control Act of 1946. The COE also developed the lower river's flood control system, which has been operated and maintained by the KRCD since its completion. The agency operates and maintains Pine Flat Dam with the 28 member units of the KRWA reimbursing the COE for 37.4 percent of all O&M costs. The COE is in full charge of flood operations. It administers recreational facilities around the reservoir. A decade ago, environmental restoration responsibilities were assigned to the COE by Congress. That led to a reconnaissance investigation by the agency of possible Kings River environmental enhancement and restoration projects. Several potential projects identified in the earlier examination are currently the subject of a feasibility study that is supported locally by the KRCD with the backing of the KRWA.

π California Department of Fish and Game is the principal state agency with stewardship responsibility for the public trust in fish and wildlife. It manages and protects these resources, enforces regulations and provides information about fish and wildlife status and trends for purposes of conducting the affairs of the state. The CDFG's staff in Fresno has been working closely for more than 10 years with KRCD's environmental staff members in developing scientifically-based data and information that can be used in formulating Kings River fishery management tools.

π Kings River Water Association, a private organization formed under the 1927 Kings River agreement by the river's water users. The KRWA's staff is headed by the

watermaster whose duties include administering the river, water entitlements, storage, releases and diversions. Entitlements of the KRWA's 28 member units are governed by complex agreements and water schedules that are based upon the river's calculated mean daily natural (pre-project) flow at Piedra. Each member unit's daily entitlement is stored in Pine Flat Reservoir in contracted space. The water is not released until requested. Each individual member unit decides whether to store or run its entitlement. Under normal operating conditions, KRWA's watermaster administers Pine Flat water releases and deliveries to the respective headgates. Complete records are maintained for conveyance and diversions into each canal.

π Kings River Conservation District, a public agency formed in 1951 and now including 1.2 million acres in Fresno, Kings and Tulare counties. Along with its lower river operation and maintenance work to maintain flood carrying capacity, the KRCD owns and operates the Pine Flat Power Plant, a facility that generates electrical energy only when there is a demand for water releases by KRWA member units or the Army Corps of Engineers. The KRCD's water management staff works directly with growers to improve on-farm water efficiency and conservation, while joining with the engineering staff in conducting surface water and groundwater management studies. The environmental staff for many years has been involved with monitoring of the river's dissolved oxygen and temperatures, fish population and creel surveying, fishery studies, revegetation projects and other studies aimed at benefitting fish and wildlife, as well as plants and natural communities.

## FISHERIES NEWS

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