

CACHE CREEK STREAMWAY STUDY

3.4 CACHE CREEK HISTORY OF HUMAN INFLUENCES

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Purpose of Historical Analysis

The physical evolution of watersheds and channels occurs as the result of a number of interactive influences. Major physical processes and characteristics related to watershed and channel evolution include water discharge, channel shape and slope, geology and soils, sediment discharge, vegetation, and human influences. All of these influences vary over time, and some (e.g., water and sediment discharge) have episodic characteristics which strongly influence channel changes. Channel morphology responds to an integration of all these physical and biological influences over time and space, and adjustments in channel form to particular influences can occur very rapidly, or over a period of decades. Channel response is extremely complex, and it is usually impossible to isolate the effects of a single variable. However, it is possible to draw general conclusions regarding channel response to a variety of influences, and to predict channel changes based on current conditions and historical trends. In order to understand current conditions on a stream, it is necessary to review the historical influence of changes along the stream channel and in the watershed. This chapter presents a general history of Cache Creek, focusing on significant human influences. This research establishes a historical context for tracing significant changes in channel morphology over time using historical aerial photography and mapping. The results of detailed comparisons of channel geomorphology based on aerial photography and maps are presented in Section 3.5.

Early Settlement

Cache Creek plays a prominent role in the history of Yolo County and the State of California. In the days of Spanish occupation of California (1769 to 1822), Yolo County was little known to any except the native people and a few trappers. The name Patwin, derived from the Wintun word meaning "people," is the name given by ethnographers to the native people who inhabited the lower Sacramento Valley at this time. The word Yolo comes from the Patwin "yoloy" meaning a place abounding with rushes.¹ The Patwin were non-agrarian people living on high ground next to watercourses in the lower valleys, in areas with abundant game and other food sources, including acorns and the roots of tules.

In 1821, the Spanish Conquistadors undertook an expedition to the north of San Francisco led by Señor Don Luis Arguello. This expedition passed through what is now Yolo County, and the expedition diaries record the existence of an Indian rancho on Cache Creek about five miles northwest of the site of Woodland.² The creek is described as being surrounded by a forest of oaks and live oaks, and the rancho having about 900 inhabitants. This visit seems to have made little impression on the native people, whose legends have it that white men did not come until 1832 or 1833, the year of a terrible malaria epidemic that decimated native populations in

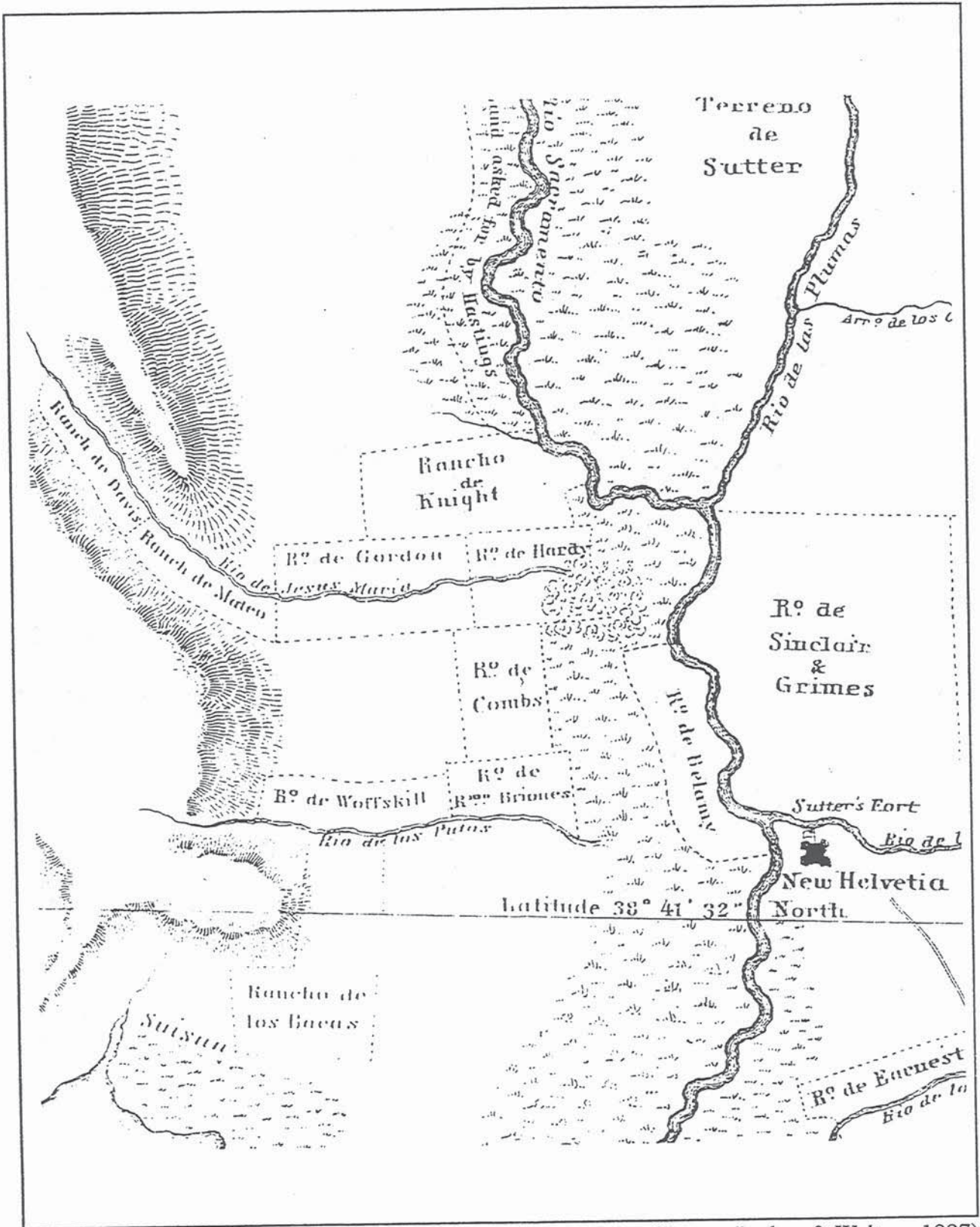
the Central Valley by an estimated 75 percent.³ The epidemic coincides with the presence along Cache Creek of a band of American trappers led by Ewing Young, although the epidemic was probably the result of extended flooding in the lowlands during the winter of 1832-1833 rather than contact with the trappers. The Hudson Bay Company also had trappers in the valley as early as 1829, who established a camp on Cache Creek (French Camp) about one mile east of the current site of Yolo. By 1832, the creek was known as "Riviere la Cache" by the company's trappers because they had a hiding place for their traps on its banks at French Camp.

Cache Creek (Rio de Jesus Maria to the Californians) was one of the earliest areas to be settled in the Sacramento Valley during the 1840s. The Sacramento Valley's earliest and best known settlers include John A. Sutter, a Swiss adventurer who arrived in Sacramento in 1839, and John Bidwell, an American who arrived in California via wagon from Missouri in 1841. At about the same time in 1842, Ohio native William Gordon moved his family from New Mexico onto land along lower Cache Creek, and requested an eight league grant from Mexican Governor Manuel Micheltoarena. The governor granted Gordon two square leagues (about 14 square miles) as *Rancho Quesesosi* in 1842. Cache Creek ran through the middle of Gordon's grant, which is located near the present site of Madison. Gordon settled on a wooded knoll and began raising stock and hunting and trapping along Cache Creek. Gordon was known for his skill as a hunter, and is reported to have killed 50 grizzly bears (which were plentiful in Yolo County at the time) in a single year.⁴ Gordon raised the first grain in Yolo County in 1843 (7 acres) and the first white child was born in the county at his *rancho* in 1846. Historian H.H. Bancroft notes that Gordon's *rancho* was a common rendezvous point for early settlers and hunters, being mentioned in historical accounts nearly as often as Sutter's Fort and Sonoma. In 1846, the infamous Bear Flag revolt incited by Captain John C. Fremont involved several participants from the lower Cache Creek Valley, who joined at Gordon's *rancho* for the ride to Sonoma.⁵

In 1843, Thomas Hardy received a six square league grant from Governor Micheltoarena on lower Cache Creek for his service in the Mexican Navy.⁶ Cache Creek ran through the middle of Hardy's *Rio Jesus Maria* grant, and his land adjoined Gordon's on its western boundary. Although Hardy was a carpenter, he made minimal improvements on his land and lived in a reed hut near a *rancheria*. He is said to have been very antisocial, and mysteriously disappeared while sailing on the Sacramento River in 1848 on his *Launch Lively*. The grant was sold at a public auction to J.M. Harbin, George Tyler, and John Parish.

In 1846, Governor Pio Pico granted the nine square league *Rancho Canada de Capay* to Nemesio, Francisco, and Santiago Berryessa. Ownership in the *rancho* was acquired by Jasper O'Farrell in 1847⁷ and the land was rather quickly divided for sale to other settlers in the Capay Valley.⁸

Figure 3.4-1 shows John Bidwell's map of the lower Sacramento Valley from 1844, including the location of several ranchos. The *Rancho Canada de Capay* included the land shown on Bidwell's map as *Rancho de Davis* and *Rancho de Mateo*, extending along both sides of Cache Creek into the upper part of Capay Valley. These three ranchos encompassed nearly 76,000 acres of land along approximately 40 miles of Cache Creek, including the entire study area.



(Source: Larkey & Walters, 1987)

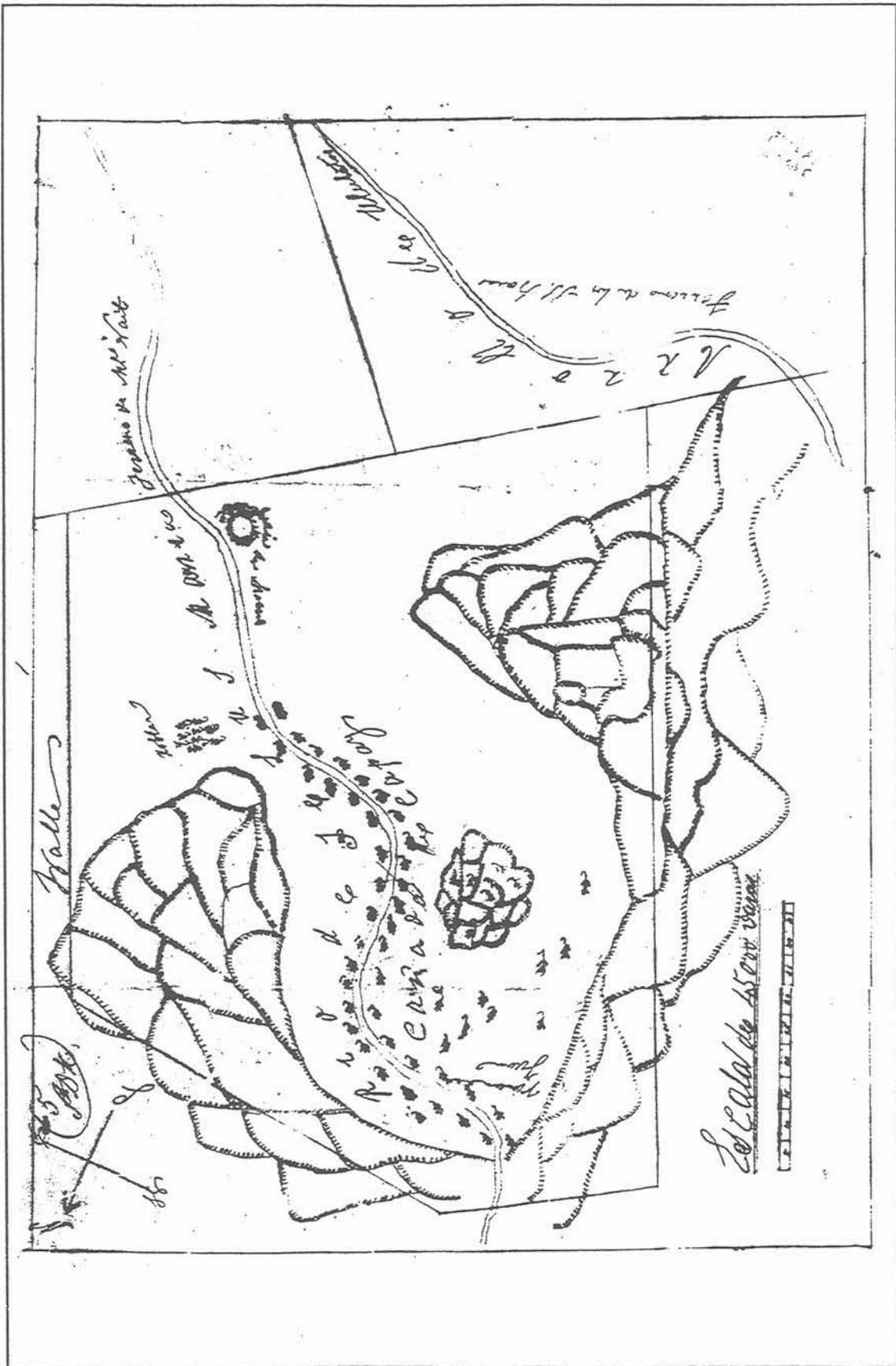
Figure 3.4-1 Portion of John Bidwell's 1844
"Mapa del Valle Sacramento"

The Spanish and Mexican grants of *ranchos* inspired settlement of much of California's best agricultural lands and establishment of traditional Mexican patterns of *rancho* life. Spanish was the language most often spoken by these early settlers. The declaration of war and defeat of Mexico by the United States had grave consequences for the *rancheros*. With the treaty of Guadalupe Hidalgo in 1848 and admission of California into the Union in 1850 came a review of land titles that would prove to be very costly for many of the original settlers. New immigrants from the United States placed pressure on the government to provide for public settlement of lands in California and squatters on the *ranchos* were common. In March, 1851, the U.S. Land Commission was established to review title to private lands in California and, despite provisions in the Treaty of Guadalupe Hidalgo to the contrary, placed the burden of proof on the *rancho* owners. The *rancheros* were forced into long court proceedings to defend titles to land represented on *disenos*, relatively crude maps that were a part of their original petitions for grants. The process often took many years of expensive court battles during which squatters occupied their lands. All of the *ranchos* along Cache Creek were eventually confirmed to the original grantees or their successors. As an example, Figure 3.4-2 shows the original *diseño* for the *Rancho Canada de Capay*, and Figure 3.4-3 shows the U.S. Government survey of 1857. A patent to the land was finally issued to Jasper O'Farrell in 1865 (14 years after the review of title began) after confirmation by the Land Commission and appeal to the Northern District Court.⁹

The discovery of gold in 1848 brought hordes of prospective miners to California and depopulated many of the previously settled agricultural areas. Jonas Spect, a Yolo county settler who used his earnings from mining gold to set up a store in Sacramento, was also responsible for starting the town of Fremont. Fremont was founded near the Cache Creek sinks at the confluence of the Sacramento and Feather Rivers, on land that Spect was apparently unaware was included in Thomas Harding's grant. By the fall of 1849 there were 700 people in Fremont, and it was the only organized town in Yolo county when California's state government began to function in December, 1849. Fremont was the site of the county's first store, hotel, frame building, Sunday school and murder in 1849. In June of 1850, the Court of Sessions divided the county into three townships - Fremont, Washington, and Cache Creek. Fremont suffered flooding during the winter of 1849-1850, and suffered a loss in the trade from gold miners as navigation pushed up the Feather River to Marysville. Discouraged residents moved to drier, more economically favorable locations, and the town dwindled rapidly. The county seat was relocated to Washington (current site of West Sacramento) in 1851.

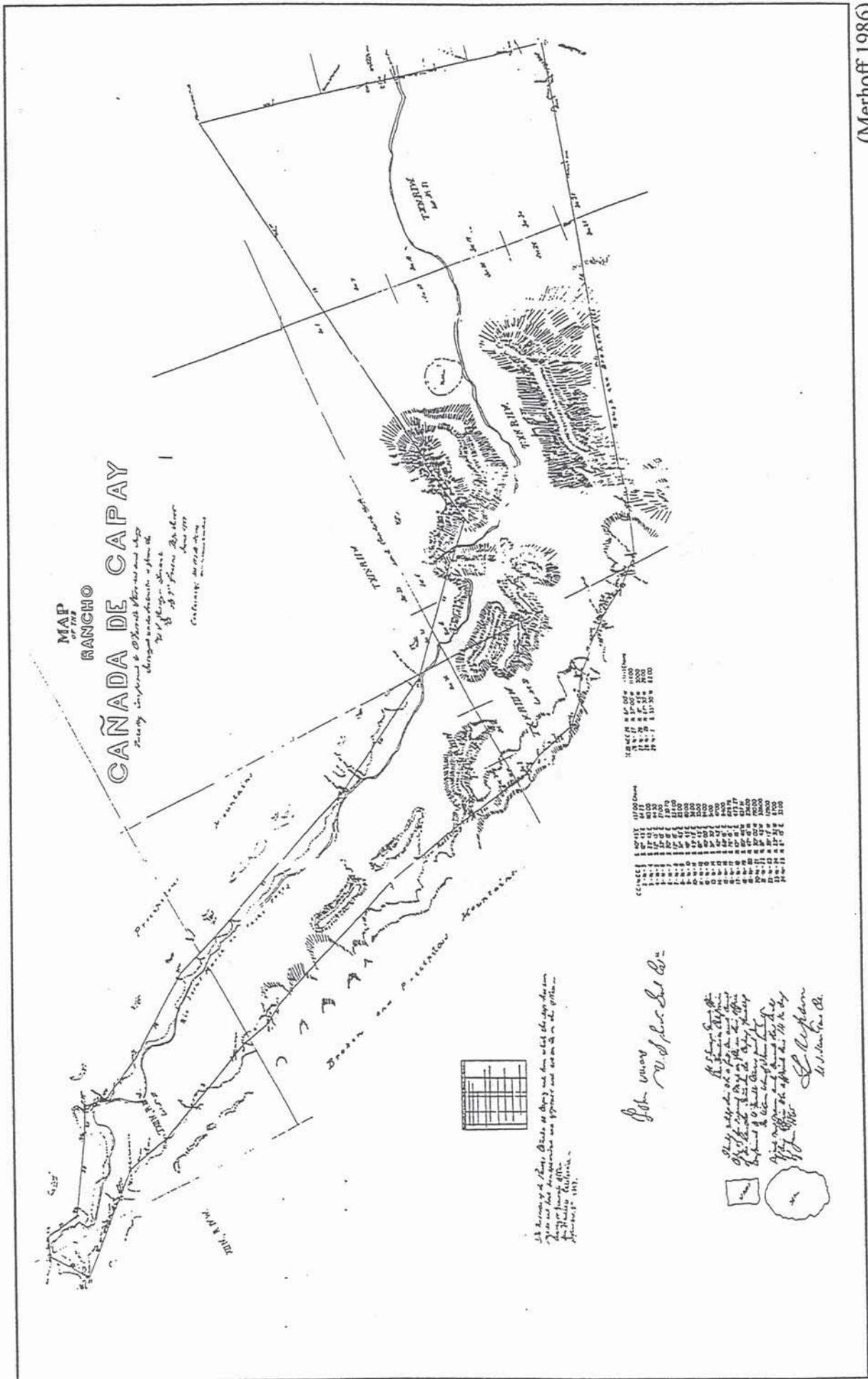
Agriculture

During the 1850s, agriculture began to blossom in Yolo County, and the valleys of Putah and Cache Creek were the centers of farming and stock raising. At this time, the broad Sacramento Valley was largely covered by tules and it was the tributary valleys that held the best farm land. In 1850, the population of Yolo County was 1,086¹⁰ and much of this population was located in these two valleys. The county's first post office was established in 1852 at Cottonwood, near Gordon's rancho, and in 1857 the county seat was moved from Washington to Cacheville (now the town of Yolo). During this year the Yolo Democrat newspaper was also established in Cacheville. By 1860 the Cacheville township had a population of 1,995, and Cache Creek water was being utilized to irrigate farmlands and to drive flour mills in Cacheville.¹¹



(California State Archives, Expediente 511)

Figure 3.4-2 Diseño for Rancho Cañada de Capay



(Merhoff, 1986)

Figure 3.4-3 Government Survey of Rancho Cañada de Capay, 1857

Early agriculture along Cache Creek and in the remainder of Yolo County focused on stock raising.¹² The plentiful grasses of the Yolo County plains and the high prices paid for meat during the Gold Rush years combined to favor stock raising as a business over farming. He reports that in 1850, hogs were about equal in value to gold nuggets, William Gordon selling them for \$1,000. In 1852, there were 1,808 horses, 314 mules, 1,855 sheep, 7,607 hogs and 9,626 head of cattle in Yolo County. The same year there were only 3,846 acres of land enclosed in the county.¹³ It should be noted that at this time fencing was used in opposite fashion from today. Land was fenced for farming to protect it from stock, which were allowed to roam free in other areas. By 1855 there were over 27,000 cattle and 35,000 hogs in the county. The *Western Shore Gazetteer*¹⁴ describes the county in the 1850s as being overrun by hogs, and Gilbert notes that fortunes were made on grasses growing in Yolo and the acorns from thousands of oaks covering the valley along Cache Creek. Acorns were important forage for grazing stock, especially hogs. In the 1860s, sheep raising became important in the county and again the Cache Creek area was the center of this activity. Although not well documented, grazing such large numbers of stock must have had a dramatic impact on vegetation in the county and in particular on Cache Creek and its valley.

Stock raising relied on natural open range without provision for supplemental food or shelter. The severe winter of 1861-62 brought snow and rain, on the 5th of January, a storm began which changed from rain to snow, bringing a succession of five snowstorms and an accumulation of sixteen inches of snow in the Cache Creek Valley. This storm resulted in the death of large numbers of hogs and cattle. The drought of 1863 and 1864 further decimated the stock herds, especially cattle, and caused the people to turn their attention to farming.¹⁵ Table 3.4-1¹⁶ summarizes the growth of stock raising in the county from 1852 to 1879. Grain raising came to the county as early as 1845 at Gordon's rancho, but could not develop extensively without a reliable source of water. The Cache Creek Valley was one of the first areas in the state to develop irrigated agriculture, and the construction of several agricultural ditches to divert water from the creek in the 1850s and 1860s (see below) supported the expansion of wheat, barley and alfalfa croplands. Table 3.4-2¹⁷ summarizes the growth of farming from 1852 to 1878. The success of agriculture in the Cache Creek Valley supported a large proportion of Yolo County's population, and in 1870 the population of Cacheville district was over 3,000 people.¹⁸

Irrigation promoted the expansion of alfalfa crops in the lower Cache Creek Valley by allowing five to seven cuttings per year, rather than one. In 1880, the State Engineer's report estimated that about 14,000 acres were irrigated by Cache Creek waters, primarily in alfalfa. Irrigation also helped establish grape growing in the Cache Creek area, including the 450 acre Orleans Vineyard, established in 1861, about six miles west of Madison. John Gilley's Vineyard at the Adobe Ranch on the original Rancho Canada de Capay grant won the award in 1861 for the finest vines in the state.¹⁹ By 1878, about 1,100 acres in the county were planted to grapes, and produced over 200,000 gallons of wine and 4,000 gallons of brandy.

The value of farmland increased as irrigation became more prevalent. In 1879, farmland sold for \$25 to \$100 per acre; in 1900 irrigated land sold for \$175 to 300 per acre.²⁰ Farmers also formed granges to increase their bargaining and buying power. Eight granges were formed in

Table 3.4-1 Summary of the Growth of Stock Raising in Yolo County

STATISTICAL TABLE.

Showing the Increase and Decrease of Live Stock in the County since 1852; Taken from the Assessors' Reports.

	1852.	1854.	1855.	1856.	1857.	1860.	1866.	1870.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Number Horses	1,808	5,000	6,000	3,937	3,271	3,940	4,480	9,773	7,272	5,527	6,636	6,730	5,377	6,601	7,124
Number Mules	314	.....	.....	.....	500	373	1,976	1,167	1,012	1,121	805	876	876	877	767
Number Horned Cattle	9,626	20,000	23,000	19,000	18,272	23,480	8,770	11,260	10,156	8,532	8,421	7,714	7,714	6,830	3,401
Number Sheep	1,855	4,200	2,000	13,760	9,599	30,971	59,166	40,255	60,726	78,986	75,809	92,497	92,238	91,595	79,921
Number Hogs	2,607	3,3000*	35,000	13,630	7,079	13,852	14,644	18,193	12,899	13,135	17,015	19,675	20,050	22,001	19,960
Pounds of Butter .....	.....	.....	50,000	.....	40,460	.....	97,020	107,500	120,000	186,920	186,920	89,756	75,175	80,113	85,000
Pounds of Cheese .....	.....	.....	10,000	.....	135,900	.....	7,940	.....	.....	8,762	8,762	17,798	12,896	16,423	18,126
Pounds of Wool .....	.....	.....	.....	45,500	113,000	77,427	162,680	201,425	160,000	326,842	411,946	739,976	823,761	44,331	36,300

* [sic]

(Gilbert, 1879)

Table 3.4-2 Summary of the Growth of Farming in Yolo County

STATISTICAL TABLE.

Showing the Growth of Production and Increase of Values in the County since 1852; taken from the Assessors' Reports and First Census of Agricultural Products.

	1852.	1854.	1855.	1855.	1857.	1860.	1866.	1870.	1873.	1874.	1875.	1876.	1877.	1878.
Acres of land inclosed...	3,846	60,000	28,135	48,996	80,000	161,748	136,367	151,233	81,593	151,233	160,471	135,340	141,265	142,175
Acres of land cultivated...	8,000	40,000	13,300	38,996	39,698	87,471	144,011	160,450	160,450	189,157	196,847	138,995	140,000	138,500
Acres Wheat.....	1,497	600,000	226,000	Nominal	459,360	1,446,579	1,334,300	2,080,000	2,080,000	2,060,135	2,779,880	2,392,669	1,250,000	1,552,500
Bushels Wheat.....	126,076	40,000	14,200	24,442	25,694	26,408	33,155	11,315	11,315	25,289	31,371	18,559	20,000	17,500
Acres Barley.....	3,000	800,000	350,000	Nominal	1,541,640	867,590	292,460	503,780	282,875	503,780	627,420	400,620	500,000	280,000
Bushels Barley.....	5,075	3,000	100	253	120	830	25	100	100	.....	.....	.....	.....	.....
Acres Oats.....	1,310	120,000	2,200	Nominal	3,600	10,000	3,000	.....	.....	.....	.....	.....	.....	.....
Bushels Oats.....	.....	300	60	110	120	532	100	.....	.....	.....	.....	.....	.....	.....
Acres Corn.....	.....	9,000	.....	.....	.....	16,120	2,850	.....	.....	.....	.....	.....	.....	.....
Bushels Corn.....	.....	.....	.....	.....	.....	3,200	13,500	.....	.....	.....	.....	.....	.....	.....
Bushels Corn, Ground...	.....	.....	.....	.....	.....	31,000	52,500	.....	.....	.....	.....	.....	.....	.....
Bbls. Flour Made.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grist Mills.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres Peanuts.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pounds Peanuts.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres Beans.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bushels Beans.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres Potatoes.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tons ".....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres swt. ".....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tons ".....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres Onions.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bushels Onions.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Acres Hay.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tons Hay.....	6,238	6,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* 181,851 pounds raised in the State in 1866.

(Gilbert, 1879)

1873, and in 1879 Gilbert reported membership of granges in Yolo County. The number of members from the Woodland Cache Creek, West Grafton Capay Valley and Buckeye Grange represents the total in the county, indicating the importance of lands around Cache Creek and Cache Creek water to agriculture in the county.

The invention of the centrifugal pump by Byron Jackson, and its application to well and surface water irrigation in Yolo County, further expanded agricultural lands. Well irrigation was more reliable than Cache Creek diversions, and well water was found to be better in quality than Cache Creek water for irrigation of orchard crops (probably due to lower boron concentrations). The change in irrigation practices and the construction of railroads for transportation of agricultural products in the 1880s and 1890s supported a shift toward orchard crops, especially in the Capay Valley. The Vaca Valley and Clear Lake Railroad was extended from Madison to the head of Capay Valley in 1888.²¹ By the early 1900s the Capay Valley was known as one of the premier areas in the state for fruit production.

Yolo County profited during the First World War and the years immediately afterward due to the expansion of agriculture to provide food for the war effort and foreign relief efforts after the war. In 1919, the county's bank roll had increased to \$10 million, and the population had reached 13,926.²² After the war, Yolo County's many hops, grape and barley growers voted against Prohibition, but were forced to convert their lands to other uses when Prohibition went into effect in 1919. The 1920s were characterized by the continued expansion of irrigated agriculture in areas previously dry farmed, using a combination of improved surface water diversion systems and development of ground water wells.

When the United States Stock Market crashed in 1929, Yolo County agriculture was severely affected. Prices for production dropped by as much as 50 percent during the "Great Depression Years." In addition, heavy frosts in 1929, 1930 and 1932 and a very dry year in 1931 compounded the problems of agricultural producers.²³ In 1933, the Bank of Esparto and two branches of the Bank of Yolo closed permanently, although all depositors were eventually repaid. The ranks of the unemployed were swelled by migrant laborers from Mexico and the "Dust Bowl" regions.

By 1936, there were signs of recovery in the county. Rural electrification made electrical milking machines and electrically driven well pumps feasible. Almond and barley prices rose about 100 percent from the previous year and expansion of the County's agriculturally based economy was evident. By the Second World War, most of Yolo County had recovered from the "Great Depression".²⁴ During World War II, Yolo County farms increased their production to support the war effort. Despite war time price controls, farm income almost doubled during the war. Workers were scarce during this period as men and women left the county for the armed forces or war-related industries. Schools were temporarily closed at harvest time so that students and teachers could help with the work. Navajos were bussed in from Arizona and New Mexico, and Mexican workers were actively recruited.²⁵ After the war, irrigated agriculture expanded rapidly. With the advent of more efficient land leveling equipment, much larger areas could be prepared for irrigation. The dependability of irrigation by ground water and by improvement of surface water supply systems supported a shift from grain and dry farmed almond orchards to irrigated field crops (sugar beets and tomatoes). As farm acreage grew in Yolo County (510,00

in 1950 to 566,000 in 1979) farm income also grew (\$56.5 million in 1954 to \$240.4 million in 1979). However, the number of farms decreased from 1,263 in 1950 to 927 in 1979, indicating the shift towards larger, more mechanized farming in the Sacramento Valley.²⁶

Surface Water Diversions and Irrigation

As noted above, the expansion of agriculture in Yolo County is correlated to the availability of reliable irrigation water from surface and ground water sources. Irrigation diversions on Cache Creek are some of the earliest in the states history. Development of diversion systems on Cache Creek began in 1856 with the initial construction of Moore's Ditch. The diversion was made under the provision of a deed from William Gordon, which gave James Moore the exclusive right to build a dam, use the water of Cache Creek and run the water through Gordon's land. The diversion was made with a temporary brush and gravel dam. The initial ditch was 3.5 miles long but was extended in 1864 to about nine miles in total with one branch towards Woodland and one to the South.²⁷ The capacity of the ditch was estimated at 400 cfs. The two branches were operated by the South Fork Water Ditch Company (irrigating about 1,000 acres) and the Farmers Irrigation Ditch Company (also irrigated about 1,000 acres).

On 14 June, 1859, John D. Stephens filed notice for diversion of Cache Creek water near the present site of Madison. This was the first of eight claims to Cache Creek water in Yolo County and of fifty- five in Lake County. In 1864, the Clear Lake Water Company built a dam and mill at Lower Lake on Cache Creek. The dam restricted flow from Clear Lake and at times caused flooding in the lower areas around the lake. After local residents were denied relief in court, they solved the problem by applying dynamite to the mill structure. On May 30, 1871, the same company filed the second claim to Cache Creek water, followed on June 14, 1871 by a claim by the Cacheville Agricultural Ditch company "to divert water in Cache Creek and it's tributaries for irrigation and power to supply towns and villages." The Cacheville company had been organized in 1859, and had constructed a headworks on the north side of the creek just downstream of Moore's Ditch. A system of laterals delivered water to the lands from about five miles above Cacheville (now Yolo) to about one mile below on the north side of the creek. Several thousand acres were included in the service area.²⁸ When Moore enlarged the ditch in 1864, the Cacheville groups took the case to court. The company won an injunction limiting Moores diversion, but the case was overturned in the California Supreme Court in 1874 and the Cacheville company went out of business.

In 1871, the Clear Lake Water Company constructed a dam at the head of the Capay Valley above Rumsey.²⁹ The Capay Valley Ditch was completed three years later and had a length of nine miles. Moore filed for an injunction, but did not obtain a favorable judgement until his third complaint in the matter (September, 1880), which was settled in August, 1883. The court found that Moore was "entitled at all times to appropriate and take out of the waters of Cache Creek 432 cubic feet of water per second." The judgement was upheld on appeal and the Clear Lake enterprise was abandoned.

In 1880, the State Engineers Office prepared a report on the potential for irrigation in California, making comparisons to other river systems in Italy, France, Spain and India. In the appendices to this report are descriptions of irrigation works in Yolo County, the Cache Creek area being one

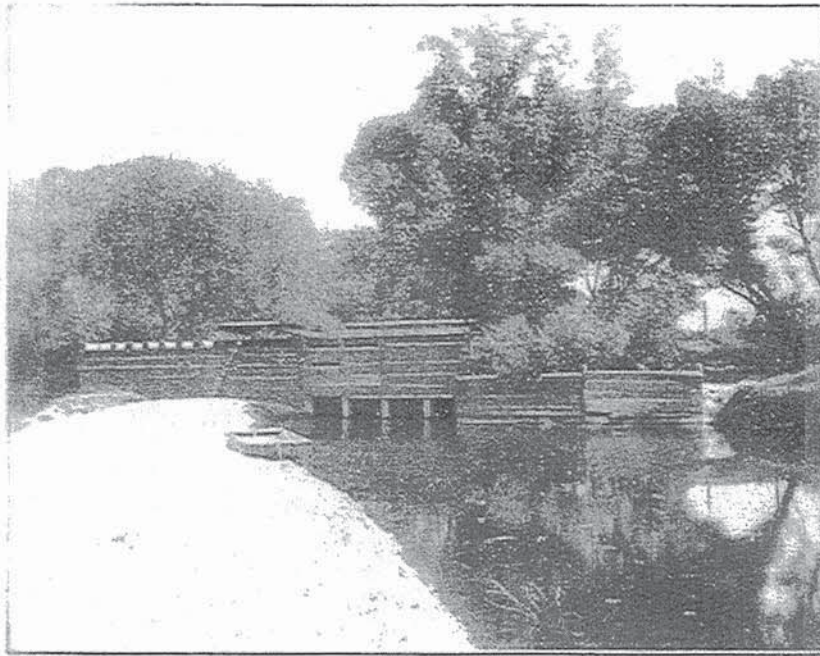
of the few areas in the state with extensive irrigation development at the time. This appendix on Yolo County, written by J.D. Schuyler, describes the extent and condition of ditches in 1880. This portion of the report is summarized in Table 3.4-3. In addition to the ditches listed above, two canals proposed by the Clear Lake Water Works are described in Schuyler's report. The two canals were to have their head at a dam located about three miles above Capay. At the time of Schuyler's report, the dam had already been constructed and was made of timber bolted to a sandstone bed outcrop and filled with rock. The dam was in place in 1880, but had been flanked on both sides by the creek. The two proposed canals would have been taken off the right and left banks of the creek above the dam. The one on the left bank was intended to irrigate the plains on the north of Cache Creek. The one to the south would have irrigated lands to the south of Cache Creek, and was intended to be navigable. Its ambitious proponents intended to extend it to deep water in Suisun Bay or other outlet to the ocean.

Although extensive irrigation works were begun by 1880, their operation was erratic and unreliable due to poor construction and disagreement over water rights.

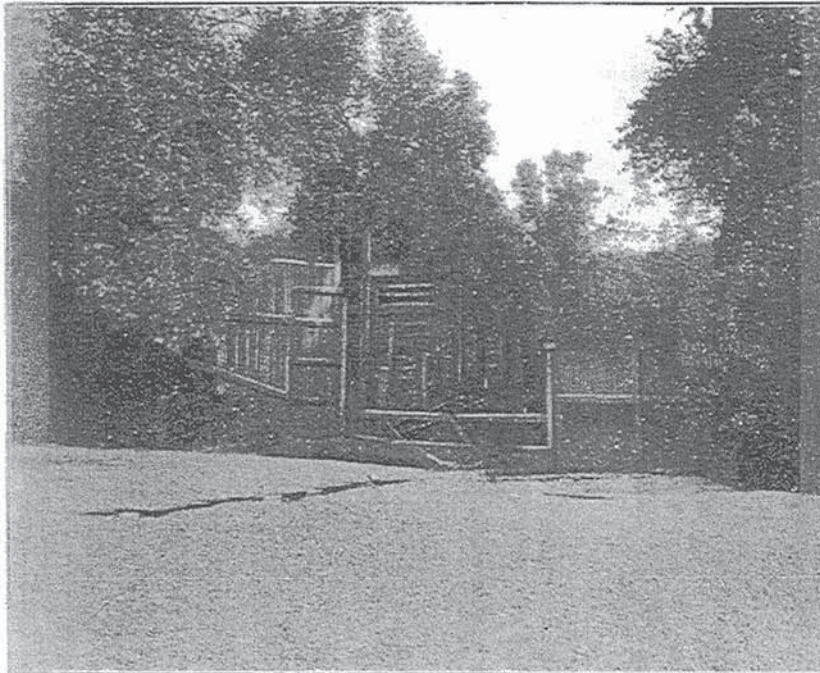
In 1901, Albert Chandler prepared a report on water storage in Cache Creek for the US Geological Survey. Chandler's report describes the Moore Ditch as the only one of importance for irrigation, the others not being in general use due to protracted litigation over water rights. The Capay Valley Ditch and Cottonwood Ditch were not in use at the time of Chandler's report, but the Adams Ditch was being used to irrigate about 80 acres on the Adams property. Chandler describes two ditches taking water from the area below Moore's Ditch - the Langenour ditch, one half mile below Nelsons Bridge, and the Hennigan ditch, located about four miles northeast of Woodland. Chandler also describes several pumping plants in use along Cache Creek:

Not being able to rely upon the irrigating ditches, many of the farmers about Woodland have resorted to pumping from Cache Creek and from wells. Now that their pumping plants are established, most of the operators find them so effective that they would hesitate to abandon them for even an improved system of ditches.

In 1901, eight pumping plants were located on Cache Creek in the Woodland district. In late summer, water was collected in pools by subsurface percolation through the gravels, and pumped from the pools for irrigation. Pumping rates were limited by the rate of replenishment by percolation into the pools. In contrast, Chandler reported that "those who use wells report on unlimited supply," and that groundwater levels were generally 10 to 25 feet below ground. In 1903, the Yolo County Water Company (YCCWC) formed, and bought many of the existing irrigation ditch systems. YCCWC's facilities included the Adams, Capay, Woodland and Moore Canal Systems. Under the ownership of YCCWC, canals were constructed to supply local ditch companies in the Madison, Winters and Davis areas.³⁰ The availability of Cache Creek water at a nominal cost was a key factor in establishment of the State Farm (later the University of California's College of Agriculture) at Davis.³¹ Ditches were also extended north to the community of Blacks (now Zamora) and south as far as Dixon. Figures 3.4-4 and 3.4-5 show some of the early irrigation works along Cache Creek from Chandler's report.



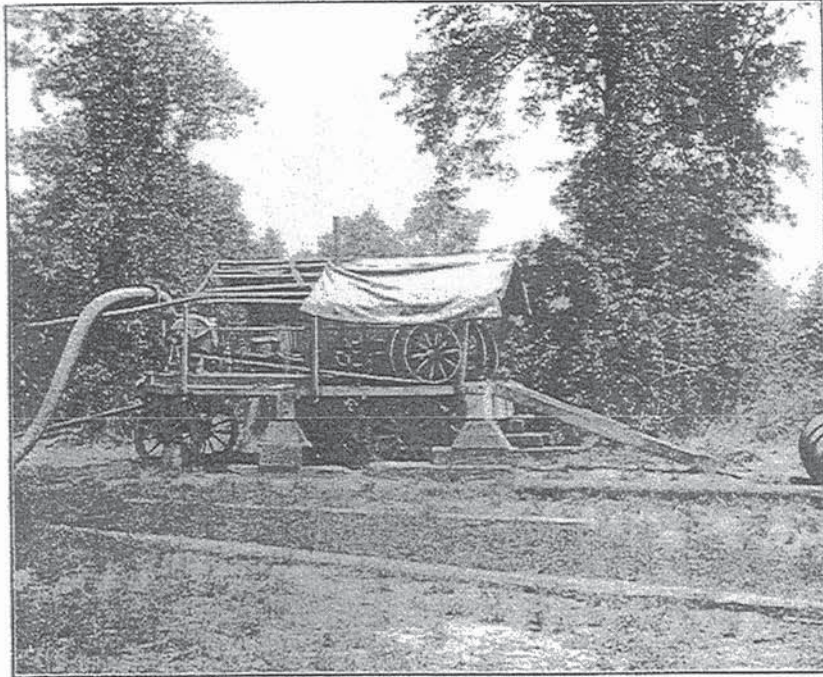
A. HEADWORKS AND DAM OF MOORE DITCH.



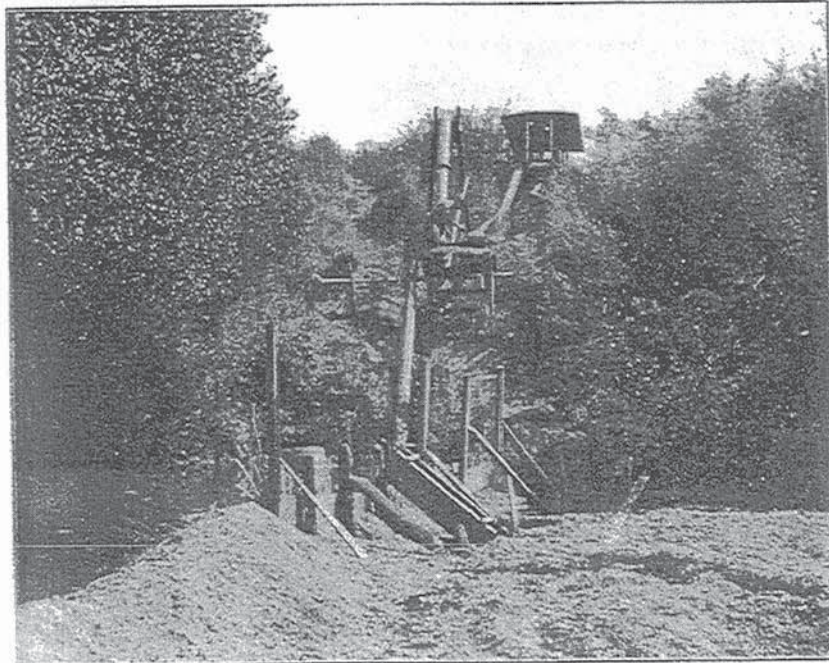
B. HEADWORKS OF LANGENOR DITCH.

(U.S. Geological Survey)

Figure 3.4-4 Early Irrigation Works



A. PORTABLE PUMPING PLANT IN CAPAY VALLEY.



B. PUMPING PLANT ON CACHE CREEK.

(U.S. Geological Survey)

Figure 3.4-5 Early Irrigation Works

Table 3.4-3 Summary of Cache Creek Irrigation Works, 1880

Ditch Name	Location of headworks	Length	Capacity	Irrigated Acreage	Crop Types	Status
Moore's Ditch	Gordon Grant about 4 miles east of Madison	8 miles plus tributaries	400 cfs	12,000 to 15,000 acres	mostly alfalfa, some vineyard	In use, needs permanent dam
Cacheville Agricultural Ditch	Downstream of Moore Ditch Headworks, left bank	6 miles	Not reported	one thousand		Not in use, headwater destroyed
Capay Valley Ditch	Near Rumsey right Bank	12 miles	Not reported but bottom width 10-24 feet	280 acres (intended to irrigate 13,000)	Alfalfa	Flumes crossing Arroyos in disrepair, leaky, whole system in poor shape.
Cottonwood Ditch	2 miles above Capay, right bank	10 miles	30 to 40 cfs	200 acres	Alfalfa	Excellent repair
Adams Ditch	Opposite Capay	3 miles	Not reported	220 acres	Chinese gardens, alfalfa	In use
Benjamin Peart Diversion	500 feet below Nelson's Bridge	2,600 feet	not reported	100 acres	alfalfa	in use
Unnamed	One mile below crossing of Woodland and Knights Landing Railroad	Not Reported	Not reported	20 Acres	Grain	In disrepair

(Russell, 1940)

In 1912, the Yolo Power and Water Company (YPWC) was organized by White and Company of New York. YPWC bought out YCCWC and sold \$7,000,000 in bonds to acquire rights to raise the level of Clear Lake for water storage and power generation.³² A dam across Cache Creek near Lower Lake was built in 1914. Litigation regarding the dam ensued, and continued until 1920, when the parties consented to a decree for operation of the lake. The Gopcevic decree gave the YPWC the right to impound ordinary high water up to 7.56 feet above zero on the Rumsey Gage, and up to nine feet above zero for a period not exceeding ten days. The Gopcevic decree also prohibited modification of the Clear Lake outlet channel.³³ The YPWC also constructed a large dam at Capay in 1915 to divert waters to the Davis - Winters Canal and the Adams Canal. Figure 3.4-6 shows the dam, circa 1920. Between 1912 and 1917, YPWC spent \$500,000 in Yolo County on dams, canals and distribution gates. Figure 3.4-7 shows the Moore Dam on Cache Creek about this time. In 1916, the company delivered 69,000 acre feet of water to 600 customers.³⁴

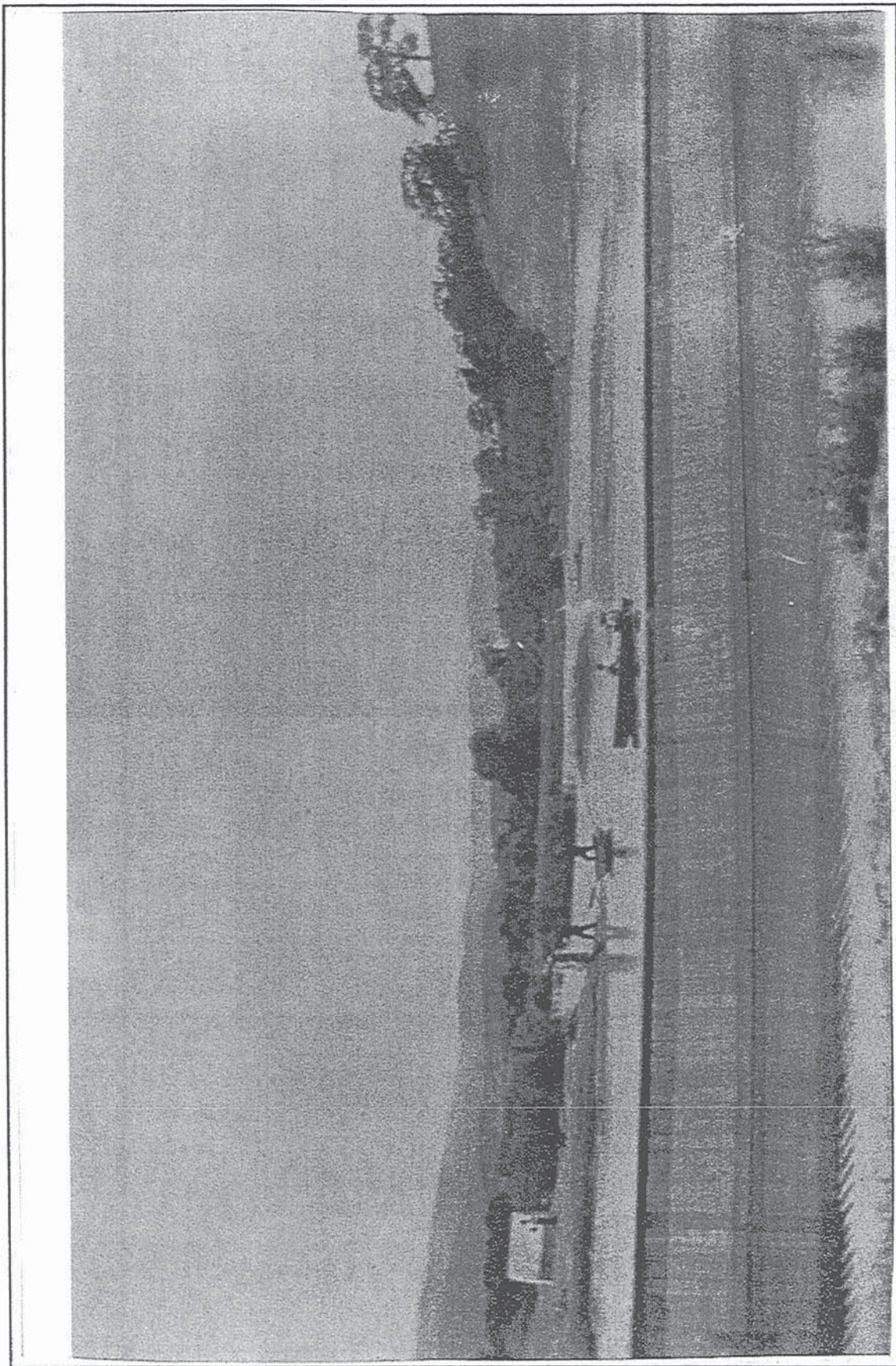
In 1924, YPWC was not able to meet the obligation on the bonds and a default resulted. The company was purchased by the Clear Lake Water Company and reorganized May 5, 1927 with a capitalization of \$1,250,000.³⁵ In 1938, the Clear Lake Water Company irrigated 15,307 acres in alfalfa, beets and general crops, and 9,851 acres in rice.

The Yolo County Flood Control and Water Conservation District was created by the legislature in 1951. In 1967, the district acquired the Clear Lake Water Company. In 1972, the district succeeded in passing a \$4.4 million bond issue for construction of Indian Valley Reservoir. The dam was completed in 1976 and impounds 300,000 acre-feet of water.

Detailed irrigation diversion records are available for the period 1929 to present. These records account for diversions made by the Clear Lake Water Company (1929-1966) and the Yolo County Flood Control and Water Conservation District (1967-1994). Diversions are presently made by the YCFCWCD through several canals, shown in Figure 3.4-8. Figure 3.4-8 also shows the extent of canal development in 1915, based on USGS topographic mapping. Figure 3.4-9 shows net annual diversions from the study reach for this period (data and figure compiled by David Keith Todd Consulting Engineers). The compiled data account for return of excess irrigation water through the Alder Canal. Net annual diversions vary with annual precipitation and available runoff. Figure 3.4-9 generally shows an increasing trend during the 1930s (average annual diversion about 70,000 af), relatively uniform annual diversions from 1940 to 1976 (average about 119,000 af), increased annual diversions during the 1980s (average about 167,000 af), and lower diversions during the 1990s (average about 90,000 af). Within each period, annual diversions vary significantly, from a minimum of zero to a maximum of approximately 195,000 af.

Floods and Flood Control

Streamflow records are available at the Yolo gage for the period 1903 to present. Annual peak flows for this period are shown in Figure 3.3-5. During this period, flows over 30,000 cfs were recorded at the Yolo gage in 1940, 1942, 1958, 1965, 1970, 1983, and 1995. Prior to 1940, the gage may not have recorded all of the flow past the station (see Section 3.3). From 1903 to 1939 recorded peak annual flows do not exceed 22,000 cfs, but peaks of at least 20,000 cfs were recorded in 1907, 1909, 1911, 1914, 1915, and 1916.



(Source: Yolo County Archives)

Figure 3.4-6 Early Irrigation Works - Capay Dam

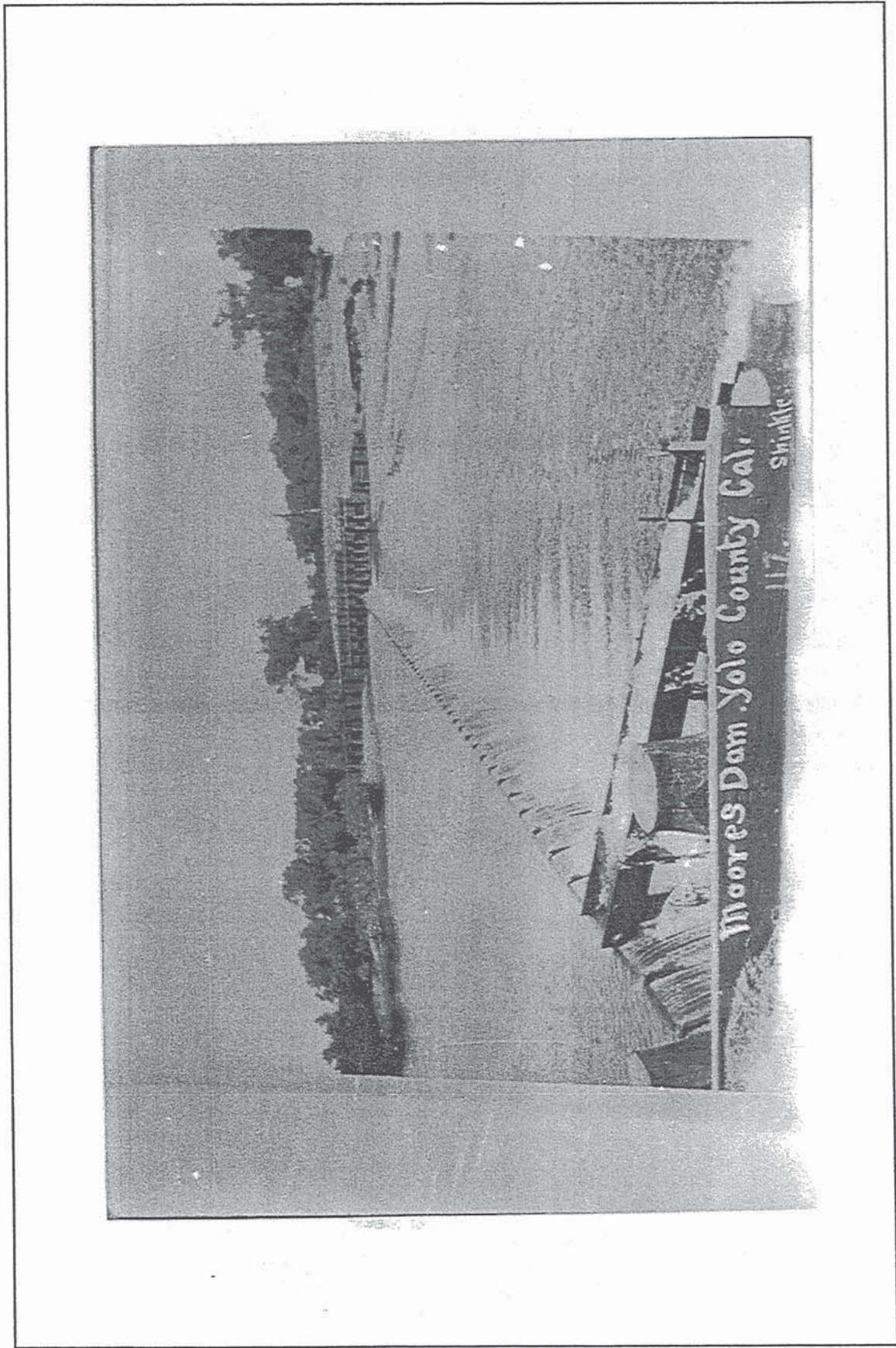


Figure 3.4-7 Moore Dam 1892-1914

- Cache & Putah Creeks
- Irrigation Canals Shown on 1915 Topographic Maps
- - Major Irrigation Canals Shown on 1987 YCFCWCD Distribution System Map (In Addition to 1915 Canals)

- Cities
- Major Roads

September, 1995

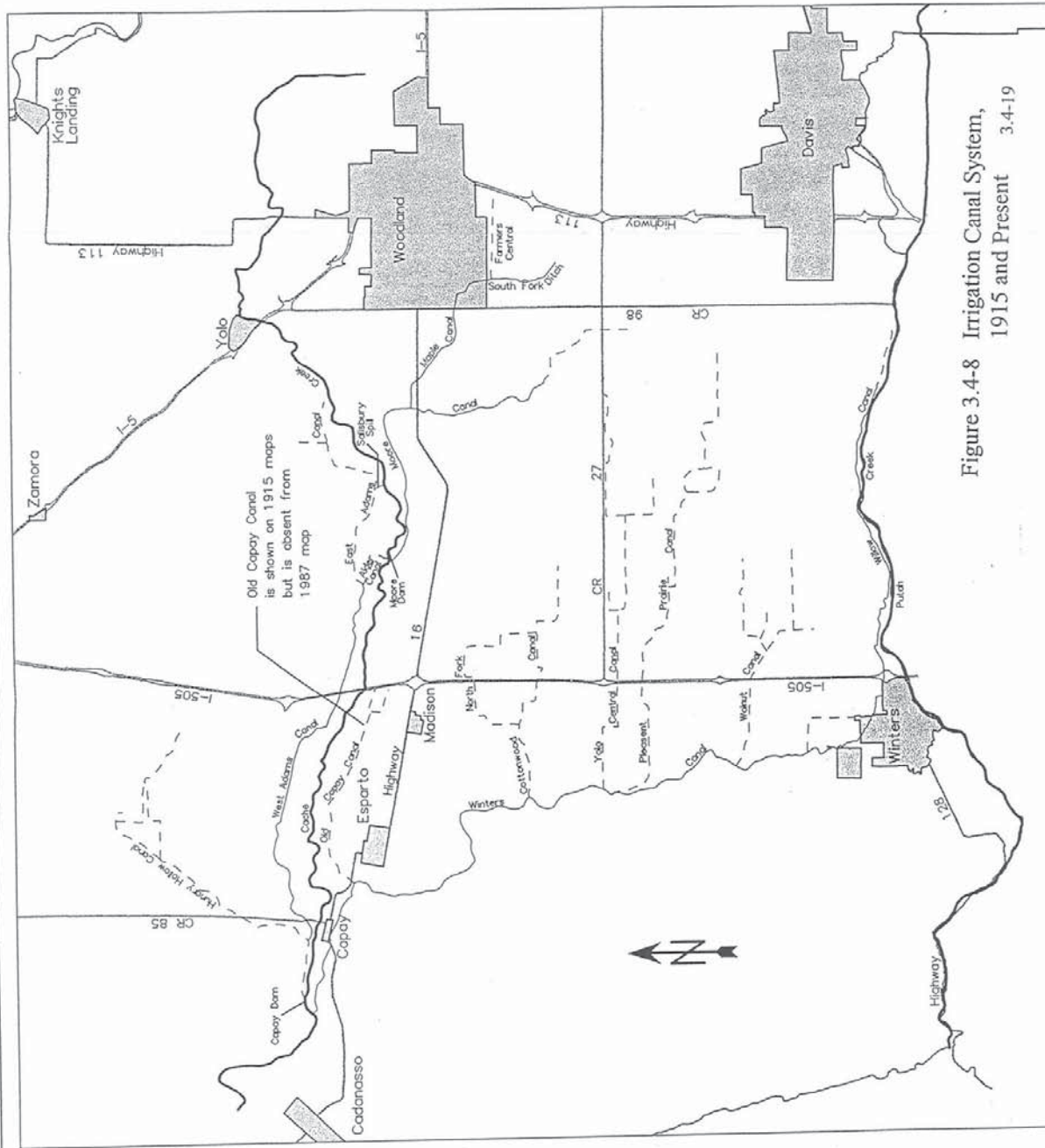


Figure 3.4-8 Irrigation Canal System, 1915 and Present 3.4-19

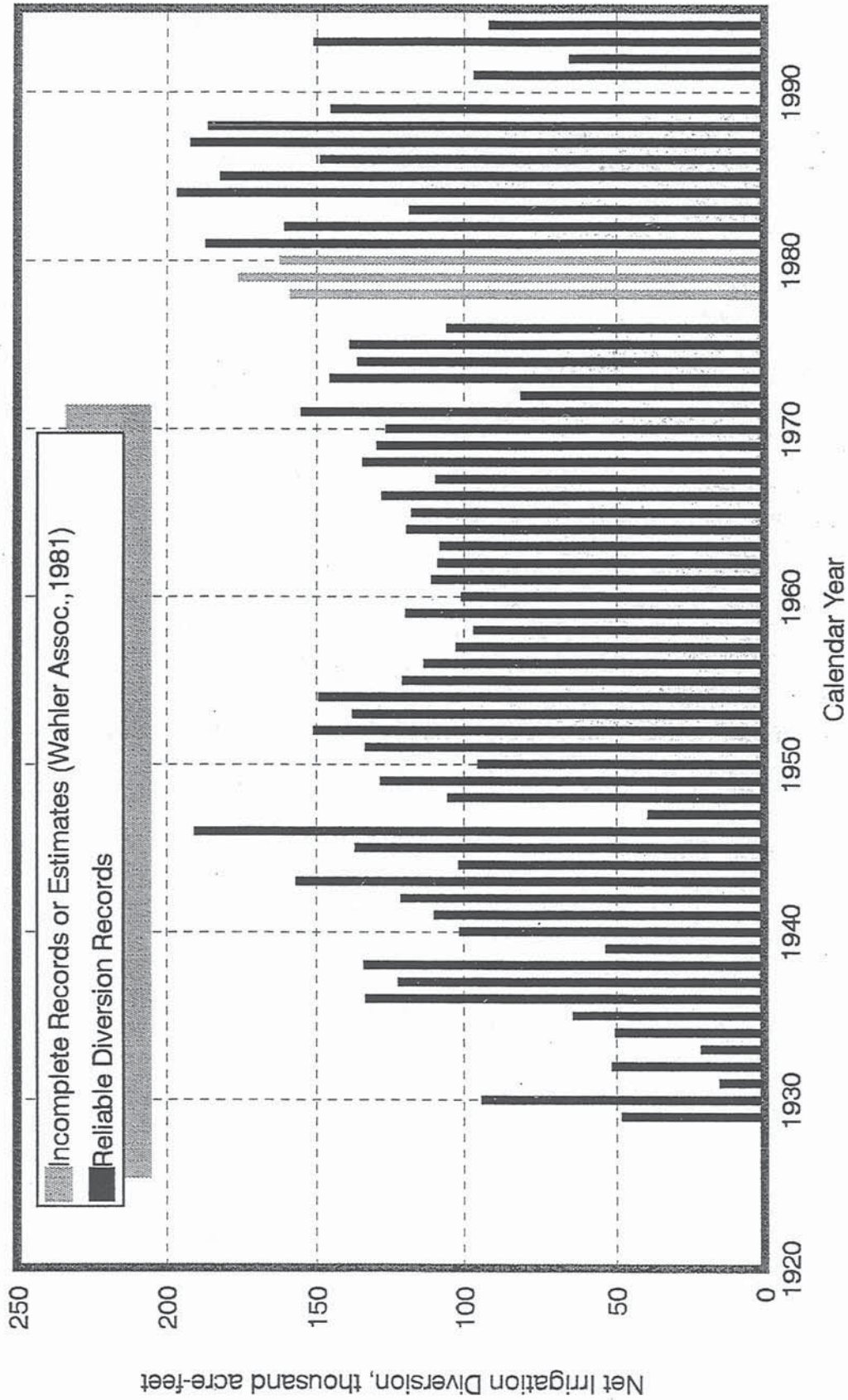


Figure 3.4-9 Net Irrigation Diversions (Source: David Keith Todd Engineers, 1995)

Prior to 1903, discharge records are not available, but historical accounts document relatively frequent and extensive flooding on the Cache Creek plains. In 1869, the *Western Shore Gazeteer*³⁶ describes Cache Creek floods which exceed the channel capacity and flow across the plains in the Cottonwood region:

During high water, when the heavy rains have swollen Cottonwood Creek to the dimensions of a powerful stream, and Cache Creek to a formidable river, their waters are united in the overflow, and Cache Creek discharges a large volume of water through the Cottonwood Plains, which finds an outlet to the tules through Willow Slough.

The same document gives an impression of the general extent of flooding in the Sacramento Valley during winter storms:

During one of these periodical floods, in March, 1847, Joe Buzzy got into his canoe at the north door of Sutter's Fort and sailed through the tules and up Willow Slough to Gordon's Rancho, on the north side of Cache Creek, meeting no greater obstructions than the strength of the current.

In 1879, Gilbert described the major floods since early settlement of Yolo County. The flood of 1850, which was extremely destructive in Sacramento, "found little in Yolo County to destroy". The newly established town of Fremont was protected by a small embankment and suffered only nuisance flooding, although the tule lands between Fremont and Washington were covered in shallow flooding. Farming had not begun in Yolo County at this time on a large scale, and damage was limited to small losses in stock. The floods which occurred in December 1852 and January 1853 were more extensive, submerging virtually all the land along the west bank of the Sacramento River from Montezuma Hills to Colusa. Sacramento had recorded 13.41 inches of rain during December, 1852. Although the flood caused extensive stock losses in western Yolo County, no accounts of damage in most of the Cache Creek area are recorded. By 1852, the County seat and most of the residents of Fremont had already been relocated.

In December 1861 and January 1862, a large flood occurred after rain in the mountains caused the Sacramento River to overflow its banks about mid-month, recede slightly, then overflow again during rains in the valley in late December and January. Cache Creek overflowed its banks near Cacheville (Yolo) and flooded several farms. The *Knight's Landing News* reported that Mr. W.G. Hunt had "a thousand head of fine sheep washed away and drowned" in the vicinity of Cacheville. During this storm the entire Yolo Basin experienced deep flooding, The Sacramento Union reporting that a sloop was sailed from Washington to Yolo City, and that George Swingle (farmer near Putah Sinks) reported houses passing down in the flood from the north in the Yolo Basin. Flooding from this storm was aggravated by an unusual snowfall in Yolo County, leaving six inches to a foot of snow in the Capay and Woodland areas. The snow remained on the ground for several weeks, covering and killing the grasses and causing thousands of stock to starve.

In 1867, the County again experienced heavy flooding beginning in late December and Cache Creek again overflowed its banks near Cacheville. Gilbert reported that on December 22 Cache Creek was "running across the country, over the north end of Charles Coil's Ranch and flowing through the barn of Mr. Campbell into the streets of Cacheville." The *Yolo Democrat* reported on January 4, 1868 that Cache Creek was again out of its banks at Cacheville, with water two

to four feet deep on the south side of the creek near the bridge. Extensive crop, livestock, and structure damage resulted throughout the county. The storm also damaged many of the local levees that had been begun by this time.

In 1878, the county experienced heavy rains during the latter part of January, causing both Putah and Cache Creeks to overflow their banks. Cache Creek overflowed its banks east of Cacheville and flowed southeast to the tule basin. In February, Cottonwood Creek also overflowed its banks and ran across country to Madison, and Cache Creek left its channel in many places upstream of Cacheville.³⁷

Between 1879 and 1903 records of flooding on Cache Creek are difficult to find, but flooding is reported in Langville (Capay) in 1882,³⁸ and Chandler (1901) reports monthly precipitation levels in 1880, 1884, 1894, 1895, 1896, and 1897 in Esparto that would likely have resulted in flooding.

Reclamation of swamp and tule lands began very early in Yolo County, with several districts organized prior to 1900. The earliest districts were organized under the State Reclamation Act of 1861, and contracts to build many miles of levees were let to local farmers beginning about 1861. The State spent approximately \$200,000 on reclamation in Yolo County, including construction of levees and a canal through the center of the tules. The state's reclamation system was not well organized, and was finally abandoned as impractical. The Board of Reclamation Commissioners was abolished in 1866 by the legislature, and reclamation turned over to the counties. Yolo County formed several reclamation districts between 1866 and 1900, but flood control efforts were not organized as a system until the state legislature approved the Sacramento Flood Control Plan in 1911 and the Sacramento River Flood Control Project was authorized by the federal government in 1917. The State and federal government participated in a partnership that constructed a flood bypass system through the Sutter and Yolo basins and constructed levees on the Sacramento River and its tributaries. Under this plan, the Fremont Weir was constructed in 1924, the Cache Creek Settling Basin was built in 1937, and locally constructed levees along Cache Creek from the Settling Basin to a point about 0.5 miles upstream of Yolo were modified to Corps of Engineers design standards. The levee work was accomplished between 1938 and 1961, when the State Reclamation Board assumed responsibility for their operation and maintenance. In 1993, the Cache Creek Settling Basin was modified by increasing the weir and levee heights and constructing new training levees.

Major floods in the twentieth century include the winters of 1940, 1942, 1958, 1965, 1970, 1983, 1986, and 1995. All of these years have peak flows in excess of 25,000 cfs recorded at the Yolo gage. Prior to 1940, Yolo gage records do not include any peaks above 22,000 cfs, but have several years in the 20,000-22,000 cfs range. This unusual record may be due to flow out of bank and around the gage, lack of recording equipment to record the peak prior to 1930, or changes in hydrologic characteristics of the system due to upstream regulation or changes in channel capacity (see Section 3.3). The flood of record at the Yolo gage was 41,800 cfs on March 9, 1995 (provisional data). The peak flow of February 25, 1958 (41,400 cfs) is the second highest flow on record.

Gravel Mining

Although not well documented prior to about 1940, the history of gravel mining extends back into the late 1800s. The creek's ready source of clean gravels and proximity to centers of population likely made it the source of construction materials for most early road and building construction in Yolo County. The earliest major project which used Cache Creek gravel may have been the construction of the California Pacific Railroad from Batavia (near Dixon) to Benicia. An estimated 10,000 to 15,000 carloads were needed for this project in 1879.³⁹ A map⁴⁰ shows the Clear Lake and Vaca Valley Railroad ending at a gravel pit on Cache Creek north of Madison. Cache Creek gravel was also shipped to San Francisco for rebuilding after the 1906 earthquake.⁴¹ Local use of gravel during the late 1800s and early 1900s was probably also extensive, although not well documented. In particular, Cache Creek was probably the source of gravel for construction of the Vaca Valley and Clear Lake Railroad lines that were extended to the Capay Valley area in the 1870s and 1880s to ship fruit crops to market. The 1905 surveys for USGS topographic maps show railroad spurs entering Cache Creek near Capay, presumably to ship extracted gravel.

As early as 1936, Yolo County began to regulate extraction of gravel from Cache Creek with the Yolo County Ordinance, but use permits were not universally required, and many operations functioned without permits.⁴² Some of the earliest detailed records of gravel extraction are found in the reports of aggregate production by the California Department of Mines and Geology (Bureau of Mines). These records are incomplete, and were usually compiled in totals by county. In some years, records are combined for more than one county to protect producer confidentiality, and methods of reporting production have changed over time. After 1960, Yolo County has compiled records of excavation of gravel from Cache Creek. These records generally reflect excavation within the channel, but after 1981 would include excavation (about 600,000 tons per year) in off-channel mining. Figure 3.3-14 in Section 3.3 presents the results of research into extraction rates by David Keith Todd Consulting Engineers for the period 1929 to 1994. This figure provides a general overview of gravel extraction from Cache Creek using both production and excavation records, subject to the following limitations in available data:

- The more recent excavation records (after 1960) are specific to Cache Creek between Capay Valley and Yolo. Production amounts include the county as a whole, including minor production below Yolo on Cache Creek and on Putah Creek.
- The production amounts are for sand and gravel and thus do not include fine material excavated with the aggregate.
- Excavation is reported in the year extracted from the creek, but production is reported in the year the aggregate is processed and sold, which may be delayed from the year in which it was extracted.

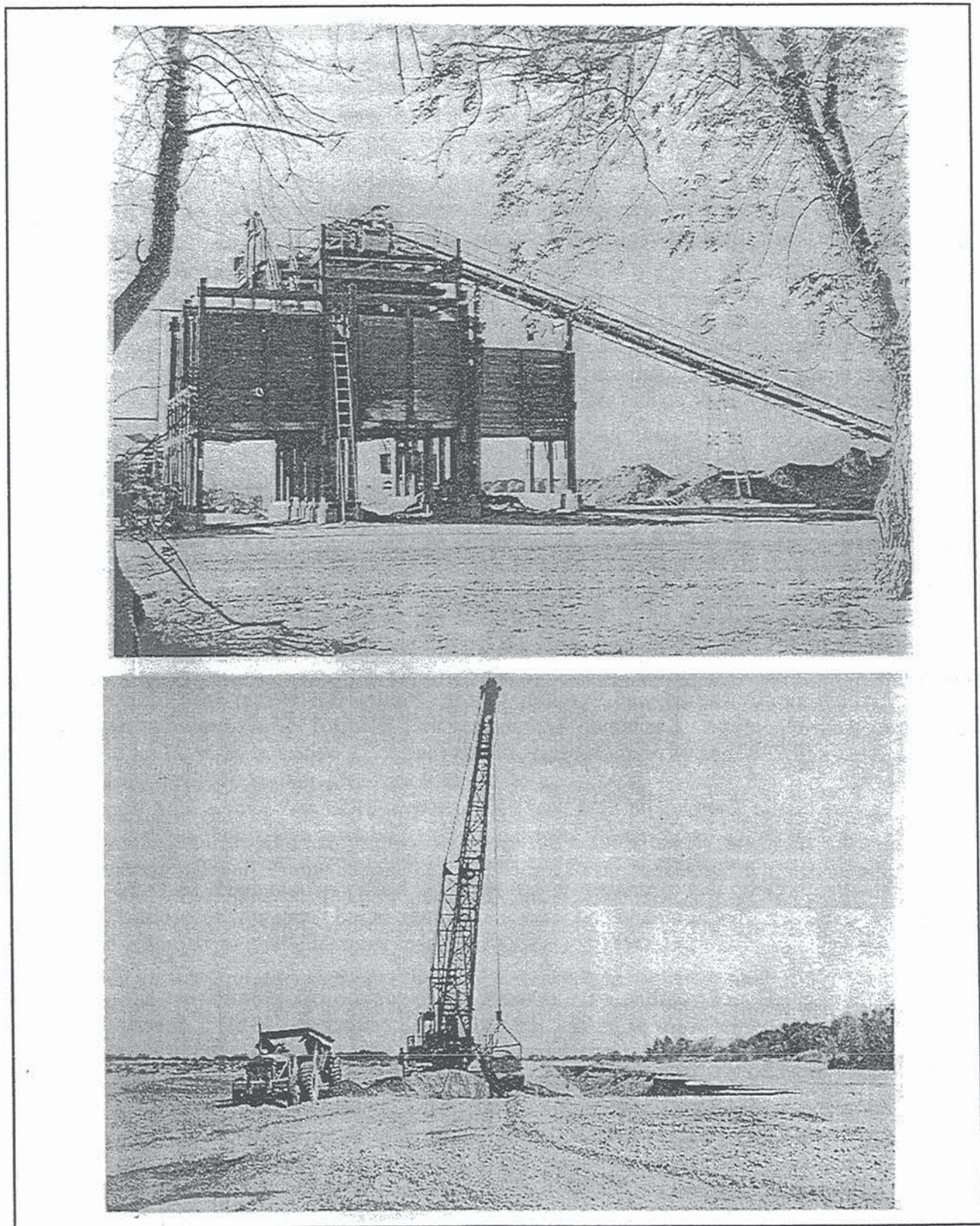
Gravel mining on Cache and Putah Creeks was the principal mining activity in Yolo County in 1948.⁴³ O'Brien provides the following description of Cache Creek in 1948:

Cache Creek flows southeastward from the northwestern corner of the county, turns eastward in the vicinity of Capay, and continues through the central portion of the county towards the Sacramento River. Its banks are gravel, covered with sandy, tan soil. They are about 5 feet high where the stream enters the valley near Capay, but rise from 10 to 20 feet in places between Esparto and Yolo. Shifting seasonable waters have deposited sand, gravel, and silt in layers and lenses on terraces and bars half a mile wide in many places along its course. The few boulders and cobbles seldom exceed 6 inches in size.”

Several commercial operations were present on the creek at the time of O’Brien’s report, located primarily in the reach just upstream from Yolo, and downstream of Highway 24 (113). Only one pit was located upstream of Stevens Bridge. Schwarzgruber and Son began operations at their plant on Road 96 in 1947, having moved from upstream sites where they had been mining since 1919.⁴⁴ O’Brien’s report describes gravel extraction operations primarily as shallow excavations on benches above the creek. Gravel was extracted mostly from terraces five to ten feet above the summer water level in excavations five to eight feet deep. Several of the descriptions indicate the presence of a clay layer at this depth.

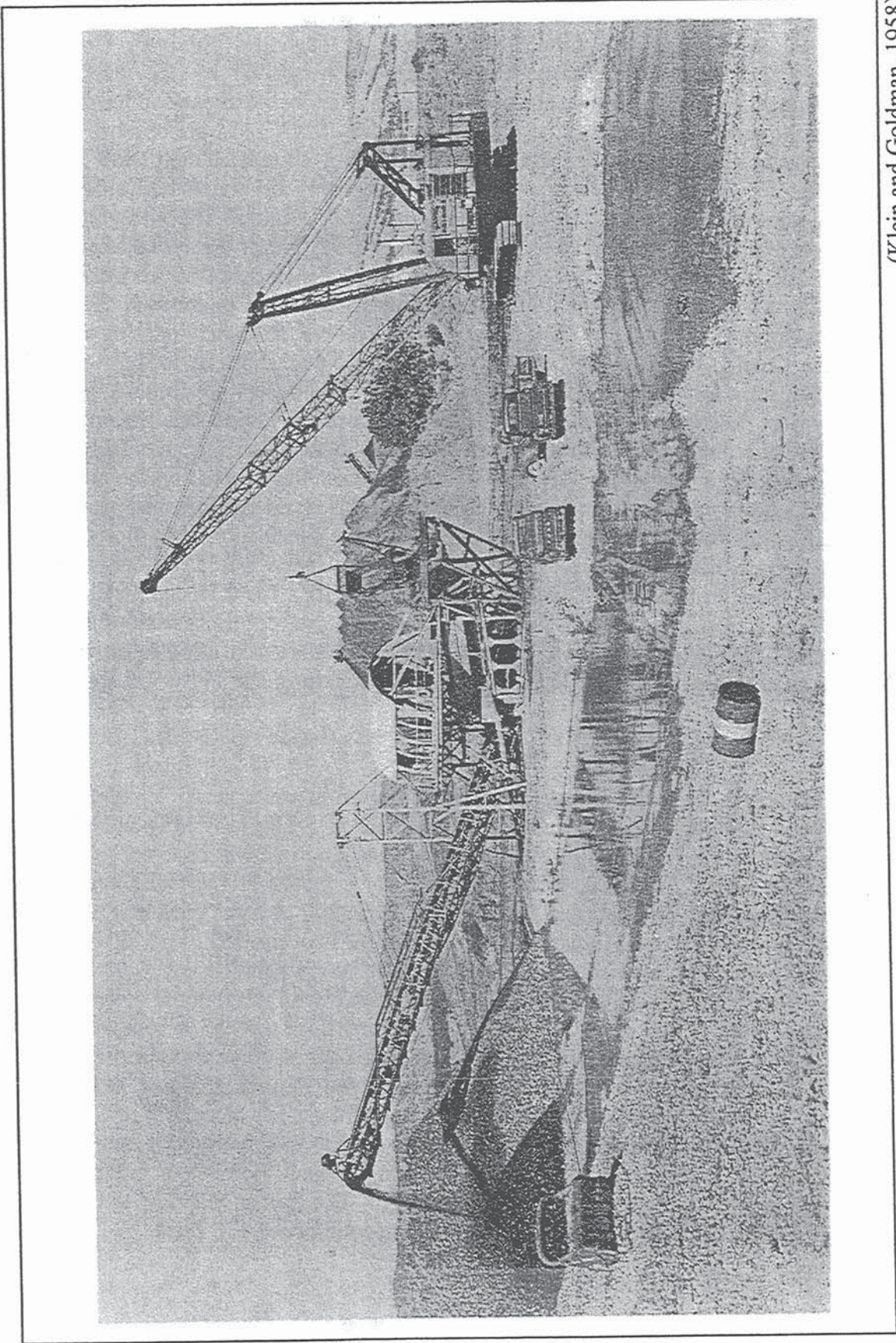
During the early 1950s, several major public works projects were begun in Yolo County, including the construction of Monticello Dam and the expansion of the federal and State highway systems. This construction increased the demand for Cache Creek aggregates. The Division of Mines and Geology published a report in 1958 that described Cache Creek aggregate resources and their importance in the region.⁴⁵ Several large commercial operations were present on the creek by this time, centered near the towns of Yolo and Madison. Klein and Goldman reported that materials were generally being excavated from the center of the creek by power shovel to a depth of about 15 feet. Excavated materials were then transported by truck or carryall and stockpiled to be processed during periods of high water. Processing was reported to be relatively simple, involving only washing and screening to size. Figures 3.4-10 and 3.4-11 show a few of the photos from this report. Klein and Goldman reported that in 1955 six commercial operators had extracted 878,698 tons of sand and gravel from the creek, valued at \$806,218. In addition, they reported ‘non-commercial’ production of 125,000 tons of sand and 500,000 tons of gravel for use in Monticello Dam. The dam was built between 1954 and 1957. The design of the concrete arch dam called for relatively large aggregate. The three to six inch aggregate required came from the American River because this size class was not available from Cache Creek. It was originally thought that aggregate larger than 1.5 inches would have to come from the American River, but Madison Sand and Gravel Company found it possible to produce the 1.5 to 3 inch aggregate from Cache Creek by moving upstream from Madison to Esparto.

In 1963, the Yolo County Ordinance was modified to require use permits for all new gravel operations. Use permits were approved for Granite Construction (1968) Lonestar Industries (1969), Solano Concrete (1971), and Cache Creek Aggregates (1972). In 1975, the County formed the Aggregate Resources Committee (ARC) to provide recommendations on regulating the gravel industry and its effects on the creek. This committee commissioned a report by Woodward Clyde Consultants in 1976 and presented a report to the Board of Supervisors in 1977 that recommended development of an aggregate resources management plan. The California Surface Mining and Reclamation Act (SMARA) had gone into effect a year earlier, in 1976. In 1978 aggregate production from Cache Creek peaked at a total of 4.13 million tons (see Figure 3.3-14 in Section 3.3). During the same year, Solano Concrete received the first use permit to begin mining off-channel.



(Klein and Goldman, 1958)

Figure 3.4-10 Gravel Extraction on Cache Creek



(Klein and Goldman, 1958)

Figure 3.4-11 Gravel Extraction in Cache Creek

In 1979, the County adopted the Yolo County Mining and Reclamation Ordinance, establishing a 'theoretical thalweg' and setting maximum production amounts for each operator. The Yolo County Board of Supervisors also formed the Aggregate Technical Advisory Committee (AGTAC) to prepare the resource management plan recommended by the ARC. The Environmental Impact Report (EIR) was released in 1980, evaluating the impacts of mining along Cache Creek. In the same year, reclamation plans (required by SMARA) were approved for the eight mining operations located along the creek. In 1984, AGTAC completed their Draft Resource Management Plan for the creek, recommending that a floodway be maintained along Cache Creek, and that mining be permitted off-channel in deep pits. A Draft EIR was prepared by Dames and Moore to evaluate the impacts of the proposed AGTAC Draft Resource Management Plan. The Draft EIR was released in 1989, but was rejected by the Board of Supervisors in 1991 after extended discussion and comments. The Yolo County Planning Commission directed the Community Development Director in this same year to resolve the issues relating to gravel mining on Cache Creek. The Director held a series of public workshops in 1992 to develop a project description for a new EIR, and in 1993 the Board of Supervisors appointed a committee to review the project description. The Board declined to adopt the project description in 1994, but approved the Conceptual Cache Creek Resources Management Plan. This plan laid out steps to be used in developing a Cache Creek Resources Management Plan, including the preparation of three technical studies relating to creek geomorphology, biological resources, and groundwater resources. During this same year, the County accepted three applications for short-term off-channel mining permits based on analyses that showed the operators would run out of minable aggregates under their current permits within three years. EIRs for these applications were completed in 1995. In 1995, the County also approved a use permit for processing of stockpiled material by Cache Creek Aggregates. The material had been removed in 1986 to provide flood control benefits, and stockpiled on the left bank just downstream of the Capay bridge.

Bridges

The history of bridges in the study area includes failures or problems at nearly every crossing of the creek. The earliest bridges on Cache Creek were at Nelson's (Highway 113) and Cacheville (Yolo). These bridges were in place by 1869 and a ford at Langville was reported to be safe at most seasons of the year.⁴⁶ In 1880, bids were taken for a bridge at Langville, and the San Francisco Bridge Company was awarded the work for \$6,388.⁴⁷ A steel truss bridge was also built at Madison, probably close to this time. In the period between 1912 and 1919, concrete bridges were built at Esparto, Madison, Road 94B (Stevens Bridge), and Capay. The 1912 plans for the Esparto bridge shown in Figure 3.4-12 illustrate the degree to which some of these bridges restricted the floodplain of the creek and forced the entire flow through a relatively narrow opening. The nature of the channel bed, the confinement of flows to narrow openings, and the incision of the channel due to human influences has caused failures at many of the bridge locations. In 1940, the Stevens Bridge was washed out at the north abutment and the Capay Bridge was damaged at the north abutment. The Esparto Bridge was damaged during this event, and a contract was let to replace a pier and two sagging spans. Before the bridge could be repaired, the two spans were lost in high flows in 1941. The Stevens Bridge and the Capay Bridge were rebuilt in 1947, the Capay bridge being extended about 130 feet.

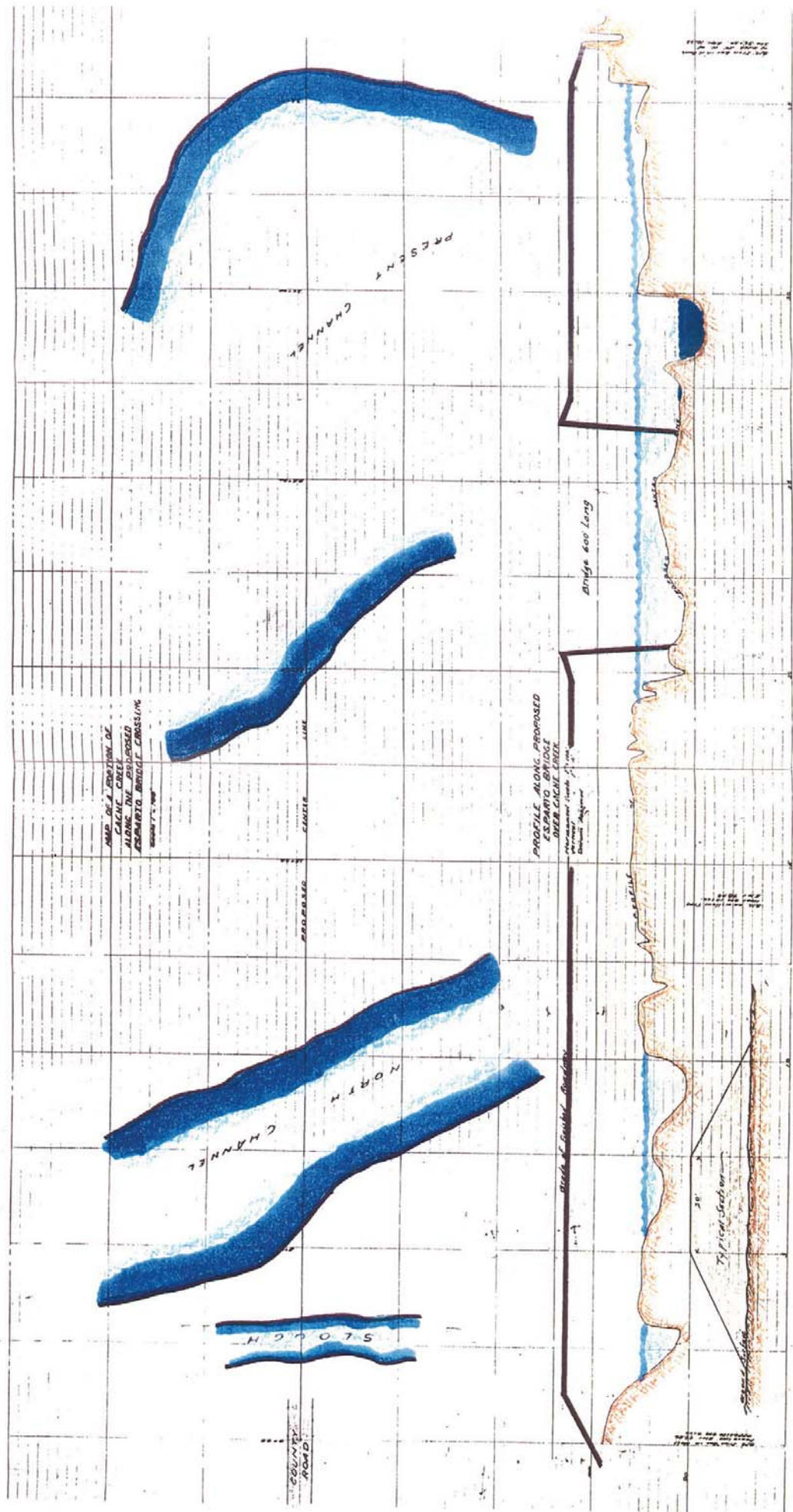


Figure 3.4-12 Esparto Bridge Plan

Bridges were constructed at I-5 (1956) and I-505 (1959) in the 1950s. A second bridge was later added at both locations 1970 for I-5 and 1977 for I-505. The existing bridge at I-505 was widened at the same time the second bridge was built.

Degradation of the channel caused continued problems at many of the bridges in the 1960s and 1970s. In 1965, the bank revetment (concrete facing) at I-505 was damaged, and in 1976 the footings of the I-505 bridges were extended 10 feet. In 1966 the Stevens bridge failed, and was rebuilt and extended with a steel section. In 1969, the left approach fill at the Stevens bridge was eroded, but the bridge did not fail. In 1973, the second pier from the south end of the Esparto Bridge collapsed, dropping two spans (see Figure 3.4-13). A temporary bridge was in service until 1978 when a new bridge was built on a slightly different alignment. In 1978, the Madison bridge collapsed unexpectedly in August 1978 after its timber piles were exposed. The Madison bridge was never replaced. In 1981, the Stevens bridge piers were reconstructed due to settlement (see Figure 3.4-14).

Throughout the 1980s and 1990s Caltrans has made measurements at many of the bridges in the study area to document channel degradation (lowering of the thalweg). Typical measurements include 14 feet of thalweg lowering at I-505, 12 feet at Esparto Bridge, and 15 feet at Capay bridge. In 1995, the Capay Bridge was substantially damaged during high flows in January and March. The left approach was eroded in January, and substantial bank loss occurred on the left bank upstream from the bridge. During the March event, settlement of one of the piers became substantial, and the bridge was closed to traffic. The County is in the process of designing bridge and river training (stabilization) improvements for this bridge site. Table 3.4-4 summarizes key points in the history of bridges in the study area.

Historical Descriptions of Channel Morphology

The morphology and riparian vegetation of the Cache Creek channel prior to the influence of significant human disturbance is of interest in analyzing morphologic changes over time and as a baseline for stream restoration concepts. This study utilizes a series of historical aerial photographs to quantify channel changes since 1937 (see Section 3.5). Prior to 1937, aerial photographs are not available, and the study must rely on maps and historical accounts to look at channel morphology and vegetation conditions. Sections 3.5 and 3.6 describe the use of the 1937 aerial photographs and the topographic maps of 1905 to characterize the channel features during this period. Unfortunately, accurate mapping of channel features is not available prior to 1905. Although *ranch* maps were completed in the 1850s the *ranchos* were located on both sides of the creek, making detailed surveys of the creek unnecessary. Other early maps reviewed in this study also fail to provide much detail on the character of the channel. Based on the discussion of agriculture and irrigation above, it is apparent that significant human influences on the creek occurred prior to the time that USGS topographic mapping was done in 1905. For example, diversion of irrigation water from the creek began in 1856, and stock grazing began in the 1840s. For this reason, it is useful to piece together the small amount of information regarding creek morphology available from historical accounts prior to 1905.

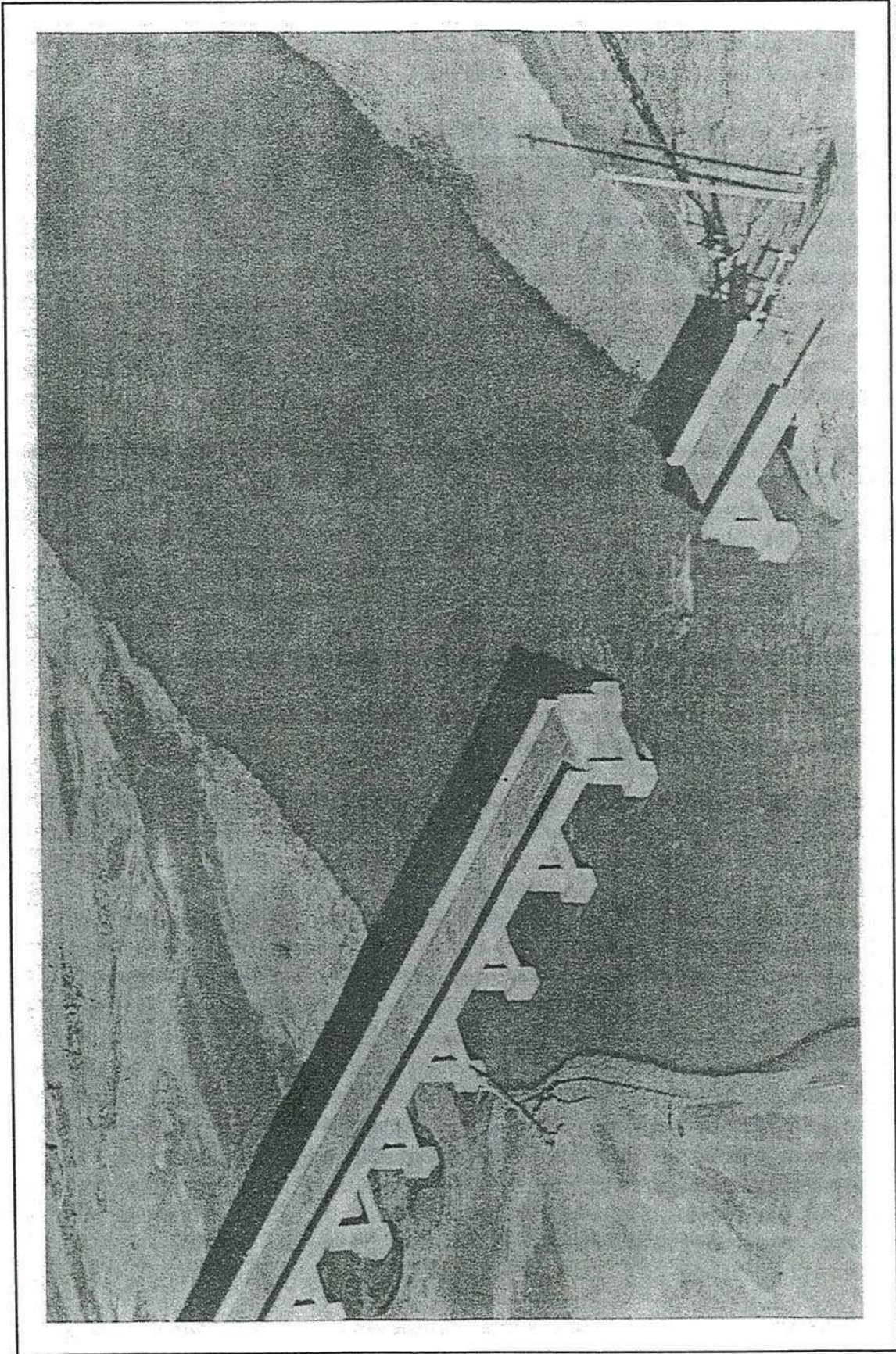


Figure 3.4-13 The Esparto Bridge Washout

(Woodland Democrat, 1973)

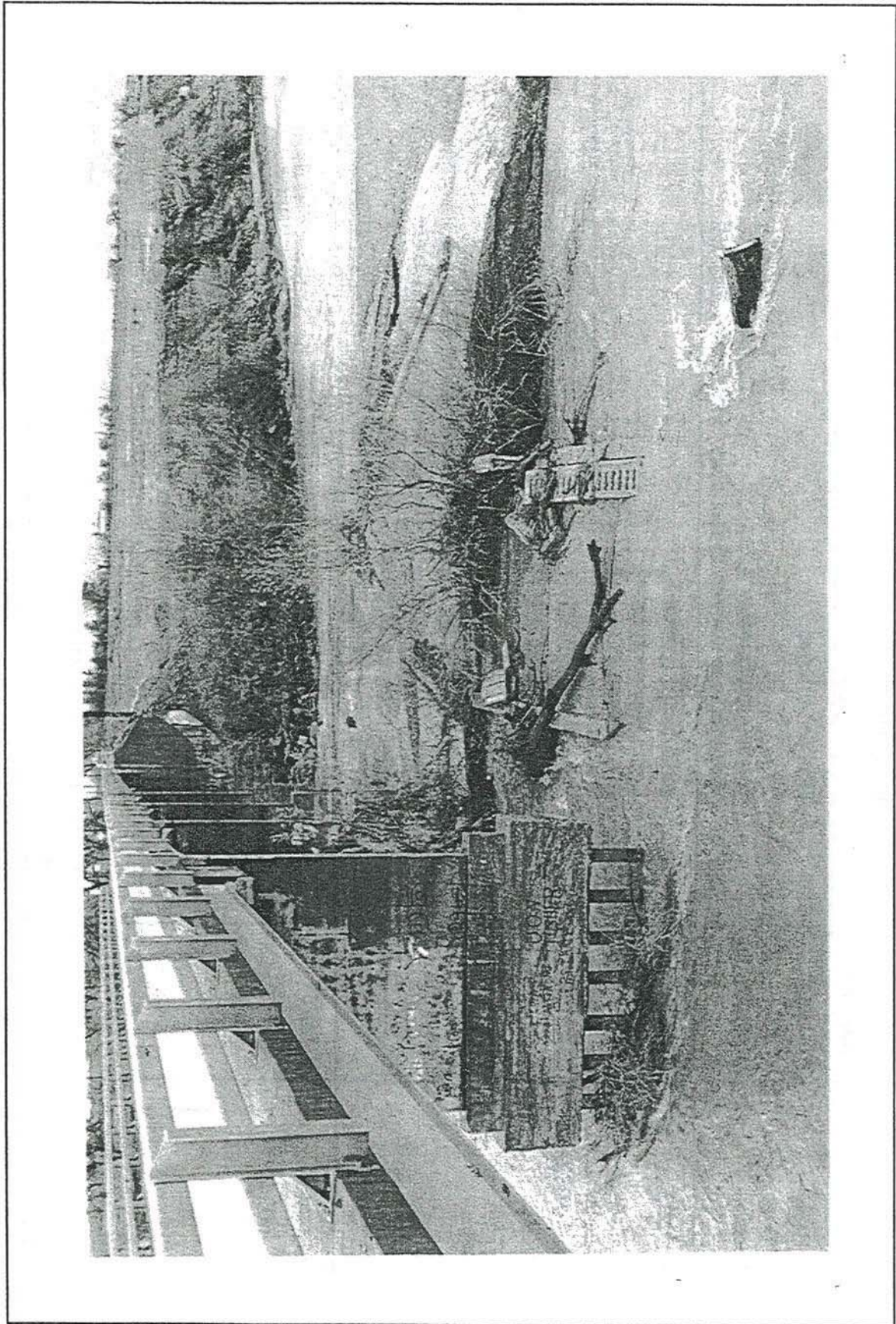


Figure 3.4-14 Stevens Bridge

Table 3.4-4 Summary of Bridge History in Cache Creek Study Area

Cache Creek Crossing	Date of Construction	Date and Description of Changes:
Yolo Bridge (CR99) Replaced	Pre 1869	Steel construction
	01/01/21	Concrete construction Bridge thalweg lowered 10 feet since 1939, scour rating A-1.
Interstate 5	01/01/56	Right bridge constructed.
	08/1/70	Left bridge constructed. Debris Problem, scour rating A-1
Stevens Bridge (CR94B) Rebuilt	01/01/18	Concrete construction
		Bridge washed out at north abutment, collapsed all but two southerly spans.
	01/01/66	North portion replaced
	01/01/69	South end of bridge washed out rebuilt and extended with a steel section. One half of roadway north of bridge washed out for 200 feet.
	01/01/81	Bridge piers reconstructed.
	06/03/93	Bridge scour rating A-3.
Interstate 505	01/01/59	Concrete construction
	01/01/63	Channel degradation and scour exposed footings of piers 5 and 6.
	01/01/65	Retard on left bank damaged by flow of 38,000 cfs
	01/01/68	Channel alignment changes caused more flow to be directed at left abutment.
	01/01/73	Left retard and revetment on both banks damaged in flow of 21,300 cfs.
	01/01/74	Concrete revetment restored on both banks, channel lowering of 6 feet.
	01/01/76	Parallel bridge constructed, footings of old and new bridges extended 10 feet.
	01/01/77	Left bridge constructed, right bridge widened.
	02/01/91	Bridge scour rating B-2
	01/01/92	Right thalweg lowered 10 feet since 1956.

Table 3.4-4 Summary of Bridge History in Cache Creek Study Area Cont.

Cache Creek Crossing	Date of Construction	Date and Description of Changes:
Madison Bridge (CR89)	01/01/17	08/01/78 Concrete construction Bridge collapsed due to exposed piles.
Esparto Bridge (CR87) Replaced	01/01/12	04/01/41 Concrete construction Esparto Bridge pier and two sagging spans washed out.
	01/01/78	02/01/73 Second pier from south end washed out and dropped two spans. New bridge at slightly different alignment.
		06/01/93 Bridge scour rating A-3, thalweg lowered 12.2 feet in 16 years.
Capay Bridge (CR85) Replaced	Pre 1880	Hungry Hollow Ford (Langville)
	01/01/1880	Steel Truss Bridge (Langville)
	01/01/19	Concrete construction
		01/01/40 North abutment damaged.
		01/01/47 Capay Bridge extended
	01/01/92 Bridge scour rating C-2	
	01/01/93 Bridge thalweg lowered 15.2 feet in 47 years.	
	01/01/95 Capay bridge structurally and seismically inadequate, scour critical, exposed timber piles.	

The earliest accounts of Cache Creek may be the diaries of the Arguello expedition, translated by Russell in 1940. The diaries give little description of the creek itself, but describes a rancheria on its banks (about five miles northwest of Woodland according to Russell; this would be near the present location of Yolo) with over 900 inhabitants. The creek is described as having a forest of oak trees and live oaks shielding it. Sprague⁴⁸ also described lands near Cacheville (Yolo) as being wooded:

Those farms bordering the creek and possessing the advantage of water are held at high figures. They are well wooded, the soil is deep, strong, and lasting. By many the land about Cacheville is considered the best in the county; it certainly possesses great advantages. This locality as well as Woodland possesses the advantage of irrigation, a ditch having been constructed which conveys the water of Cache Creek over the fields in that vicinity.

Sprague also notes that old channels of Cache Creek were evident outside of its location in 1869, and that old channels were discovered underneath the surface in construction of wells. Old banks of the creek were evident in some areas in 1869. Sprague theorized that the presence of old channels beneath the surface was the reason that the discharge of the creek decreases as it “debouches” on the plains, and one of the reasons for the flow of the creek to disappear at intervals during the summer months. A second reason noted was the diversion of most of the water from the creek into irrigation ditches. During high water, Cache Creek and Cottonwood Creek overflows were observed to unite and discharge through the Cottonwood plains to the tule lands.

Various government surveys were made in the study area between 1851 and 1869 to verify *rancho* boundaries and subdivide government lands into townships. Unfortunately, none of these surveys include a meander or boundary survey along Cache Creek due to the fact that it was non-navigable and the *ranchos* included lands on both sides of the creek. Limited information is available at the north-south rancho boundary lines that cross the creek. In 1851, F.R. Loring ran the Mount Diablo Meridian line through Yolo County. The line crosses Cache Creek about two miles east of the present I-505 bridge. The survey notes record the presence of oak forest running north from the Township 10N, R1E Section 31 southwest corner beginning at 60 chains north to about 59 chains north of the Section 30 south boundary (about one mile). The presence of willow and cottonwood scrub is noted for 21 chains (about 1,400 feet) north of the oaks to the banks of Cache Creek. A strip about six chains wide (400 feet) of willow and cottonwood is noted on the opposite bank prior to entering oaks. The creek channel itself is described as only 1.5 chains (99 feet) wide. These notes describe a wide riparian band with a relatively small active channel at this location.

A.P. Greene surveyed the Rancho Canada de Capay grant in 1857. The eastern boundary of the rancho is on the present site of Road 89 north of Madison. Greene does not describe riparian vegetation in his notes, but the notes include a call to a “live tree in the gravelly bed of Cache Creek” and subsequent call “across Cache Creek” 3.0 chains (198 feet) apart. This survey also seems to describe a relatively narrow active channel. In 1857, Thomas Stephens surveyed the Rancho Guesisosi grant, beginning at a cottonwood tree on the right bank (from the Greene survey) and crossing the creek (three chains wide). Stephens’ survey also crosses Cache Creek at the eastern boundary of Gordon’s *rancho*, located at the present site of Road 94B. Here,

Stephens notes the existence of a “sand bar, subject to overflow” south of the right bank about 20 chains (1,320 feet) wide, a channel 2.84 chains (187 feet) wide, and a “sand bank” 19.66 chains (1,297 feet) wide on the north bank. These notes describe an area subject to frequent flooding with a total width of about 2,800 feet, and a relatively small active channel within this area. Other government surveys reviewed during this study provided no additional information on channel morphology or riparian vegetation.

In 1880, the State Engineers Office produced a report on the potential for irrigation in California that included a brief description of Cache Creek. William Hammond Hall, in this report, describes Cache Creek as widening out to a channel 500 to 1,000 feet in width as it entered the Sacramento plains from Capay Valley. The creek is described as having low banks and decreased gradient in the reach between the Capay Valley and Cacheville (Yolo), but before reaching Cacheville becoming confined between vertical banks 20 to 25 feet high and 100 to 150 feet apart. This morphology continued to the lowlands of the Yolo Basin, where the banks dropped away and the stream spread out onto a broad delta, emptying into the Sacramento River through Cache Slough. “Cache Slough” in this description probably refers to the constructed Tule Drain or Tule Canal, or a branch of this drain, built during the brief tenure of the Board of Reclamation Commissioners during the 1860s. It is interesting to note that maps of Yolo County from the 1870s⁴⁹ show gravel beds at the location where the creek empties into the Yolo Basin. This area was mined for sand and gravel during the 1940s.⁵⁰ William Hammond Hall concluded that the flood waters of Cache Creek were a valuable irrigation resource that could be diverted into a channel along with Putah Creek waters and run on a grade of two to three feet per mile to Montezuma Slough, north of Suisun Bay.

In 1901, Albert Chandler described Cache Creek in a paper on water storage for the US Geological Survey. Chandler estimated the slope of the stream downstream of the Capay Valley to be four to six feet per mile (in comparison to about 30 feet per mile in the Capay Valley) and noted that its natural channel ceased in the Yolo Basin, from where it was connected to the Tule Canal through a constructed channel. Chandler described Cache Creek in the study area briefly:

Below Capay the creek widens until in some places its gravel bed is 1,000 feet from bank to bank. Above Woodland it narrows again to 100 or 200 feet, and flows between clay banks 30 to 50 feet high. Below Capay part of the flow sinks into the gravel, but it reappears again just above Moore’s dam.⁵¹

Although the historic descriptions and map information are sketchy at best, they are helpful in forming an impression of the Cache Creek Channel prior to extensive human disturbance. In general, the creek was much shallower in relation to surrounding ground than it is today, and possibly had already begun some incision by the time the 1905 topographic maps were completed. The width of the creek appears to have been variable, although in places where riparian vegetation was present, the active channel may have been only 150 to 200 feet wide. Overflow into riparian areas or onto alluvial fan surfaces would have occurred at relatively low depths of flow in the main channel. These impressions of the creek are consistent with interviews conducted during this study with longtime residents. For example, the channel at Road 94B is reported to have been too shallow to drive a bulldozer under the bridge,⁵² and features in the bottom of the channel at Road 96 are reported to have been easily visible when standing well

back from the bank.⁵³ The photos of the creek from the early 1900s (Figures 3.4-4 through 3.4-7 and others) also support these impressions. The channel at Yolo was apparently relatively deep and narrow prior to human disturbance, but may have deepened prior to 1905, possibly in response to connection of the stream to the excavated Tule Canal.

Descriptions of riparian vegetation prior to the 1900s are scarce, but the survey notes indicate that at least in some areas a much larger riparian forest was extant prior to extensive human disturbance. Although little quantitative information is available, several references note the large scale clearing and wood cutting that occurred very early in the settlement of lands around Cache Creek. As early as 1869, Sprague lamented the loss of woodland in Yolo County:

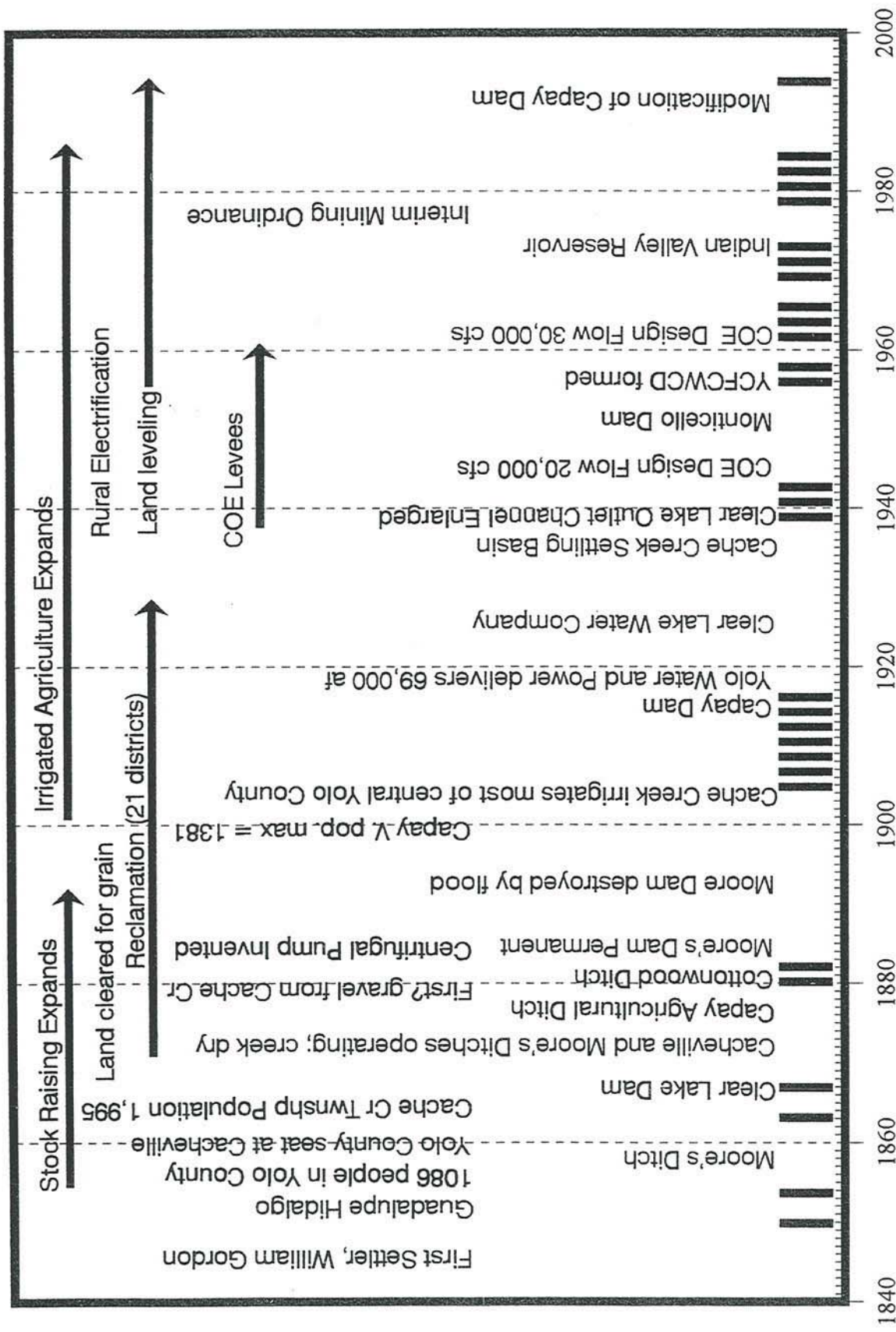
The traveler who visited this county fifteen years ago could not fail of being favorably impressed with its well wooded streams and tracts of oak timber which marked the old water courses. Should he return now, he would find but a small portion of this peculiar beauty remaining....Thousands of cords of oak have been destroyed in this county by the timber being felled for brush fences and rotting in that position....A few years hence and the effect of this wanton destruction will be felt, when Cache Creek and the plains shall be stripped of their groves and left bare and dreary.⁵⁴

Personal accounts also indicate that at least in some reaches of the creek riparian vegetation was much more extensive than today.⁵⁵ However, examination of the aerial photographs from 1937 (see Section 3.5) indicates that much of the creek in the study area had little or no riparian forest by this time.

Summary of Historical Analysis

The general historical research described here was used in this study to establish a context for more detailed review of aerial photographs (see Section 3.5). The area around Cache Creek was one of the first settled in Yolo County, and the changes in land use that occurred in the late 19th century can be inferred to have had substantial influences on creek morphology and riparian vegetation. However, accurate map information or even comprehensive narrative descriptions regarding the creek in this period are scarce. Major influences on the creek during this period include stock grazing, clearing of the land for agriculture, diversion of the creek's water for irrigation, and gravel extraction for road and railroad construction.

The influence of humans on the creek has continued to increase in the 20th century due to more extensive and intensive farming practices, groundwater pumping for irrigation, increased diversions, and substantially increased gravel extraction after about 1950, and flood control. Figure 3.4-15 shows a timeline summary of key points in the history of Cache Creek. The historical information obtained and recorded as relevant to the creek during this study have been organized in database. This format allows data to be sorted by category and chronologically.



Indicates Annual Peak Flow over 20,000 cfs

Figure 3.4-15 Cache Creek Timeline

The time available for historical research in this study has been limited by scope and budget. Additional relevant information is undoubtedly available from local residents, library collections, and other sources. An understanding of the history of the creek, including the general history of land use, is important to interpretation of current channel behavior and to formulation of management and restoration plans. The summary provided here may be used as a base for collecting, organizing, and understanding additional historical information as it becomes available to the County in the future.

ENDNOTES

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10. Sprague and Atwell, 1870.
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13. Sprague and Atwell, op. cit.
14. Sprague and Atwell, op. cit.
15. Gilbert, op. cit.
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17. Ibid.
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20. Larkey and Waters, op. cit.
21. Ibid.

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23. Larkey and Waters, op. cit.
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28. Ibid.
29. Ibid.
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31. Russell, op. cit.
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51. Albert Chandler, 1901.
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53. Schwarzgruber, personal communication, ___>?>??DATE?
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55. Farnham, personal communication, -???DATE?